GEORGIA DEPARTMENT OF TRANSPORTATION

DESIGN-BUILD CONTRACT

PROJECT NUMBER
P.I. No. 210327-

I-20 AT SAVANNAH RIVER BRIDGE REPLACEMENTS
AND ROADWAY WIDENING PROJECT

Dated Advertisement: June 14, 2018

Amendment 1 Issued: July 27, 2018

Amendment 2 Issued: August 31, 2018

Amendment 3 Issued: September 17, 2018

Letting Date: October 19, 2018
DESIGN-BUILD AGREEMENT
FOR
THE I-20 AT SAVANNAH RIVER BRIDGE REPLACEMENTS AND ROADWAY WIDENING PROJECT
PI No. 210327-

Between

Georgia Department of Transportation,
State of Georgia

and

Superior Construction Company Southeast, LLC
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DESIGN-BUILD AGREEMENT
I-20 AT SAVANNAH RIVER BRIDGE REPLACEMENTS AND ROADWAY WIDENING PROJECT

This Design and Build Agreement for the I-20 at Savannah River Bridge Replacements and Roadway Widening Project (this “Agreement”, or “DB Agreement”, or the “DBA”) is entered into and effective as of 1/10/2019 by and between the Georgia Department of Transportation ("GDOT"), an agency of the State of Georgia, and Superior Construction Company Southeast, LLC (“DB Team”).

RECITALS

A. Pursuant to Section 32-2-81 (c) of the Official Code of Georgia Annotated (the “Code”), GDOT is authorized to “combine any or all of the environmental services, utility relocation services, right of way services, design services, and construction phases of a public road or other transportation purpose project into a single contract using a design-build procedure.”

B. Pursuant to Section 32-2-81 of the Code, “the term ‘design-build procedure’ means a method of contracting under which GDOT "contracts with another party for the party to both design and build the structures, facilities, systems, and other items specified in the contract." GDOT may use the design-build procedure for buildings, bridges and approaches, rail corridors, technology deployments, and limited or controlled access projects or projects that may be constructed within existing rights of way where the scope of work can be clearly defined or when a significant savings in project delivery time can be attained.

C. Pursuant to the provisions of the Code and Chapter 672-18 of the Rules of the State Department of Transportation (the “Rules”), GDOT issued a Request for Qualifications (“RFQ”) on March 30, 2018, as amended, requesting submittals of a Statement of Qualifications (“SOQ”) from respondents desiring to develop the I-20 at Savannah River Bridge Replacements and Roadway Widening Project (the “Project”) through a Design-Build Agreement.

D. GDOT received nine (9) responsive SOQs by May 11, 2018, and subsequently shortlisted or qualified five (5) responsive Proposers.

E. On June 14, 2018, GDOT issued to the shortlisted Proposers an RFP with respect to the Project.

F. On September 26, 2018, GDOT received responses to the RFP as amended, including the response of Superior Construction Company Southeast, LLC on behalf of DB Team (the “Proposal”).

G. As part of the RFP, GDOT required that shortlisted Proposers commit to entering into an Agreement with GDOT for the design and construction of the Project.

H. An RFP Technical Review Committee comprised of GDOT and SCDOT staff determined the DB Team was the Proposer which best met the selection criteria contained in the RFP.

NOW, THEREFORE, in consideration of the Work to be performed by DB Team, and DB Team’s obligations with respect thereto, the foregoing premises and the covenants and agreements set forth herein, the Parties hereby agree as follows:
Article 1  DEFINITIONS; DB DOCUMENTS; ORDER OF PRECEDENCE; PRINCIPAL PROJECT DOCUMENTS

1.1 Abbreviations and Definitions

Abbreviations and definitions for certain terms used in this Agreement and the other DB Documents are contained in Exhibit 1. Other definitions may be identified within the text of the DB Documents.

1.2 DB Documents; Order of Precedence

Each of the DB Documents is an essential part of the agreement between the Parties. The DB Documents are intended to be complementary and to be read together with this Agreement as a complete agreement. Each of the DB Documents (other than this Agreement) is hereby expressly incorporated herein by reference.

1.2.1 Subject to Article 1.2.2, in the event of any conflict, ambiguity or inconsistency among the DB Documents, the order of precedence, from highest to lowest, shall be as follows:

1.2.1.1 Supplemental Agreements, Agreement amendments, and all exhibits, riders, and attachments thereto;

1.2.1.2 The Agreement (also referred to as Volume 1) and all exhibits thereto (other than Exhibit 2);

1.2.1.3 Volume 2 “Technical Provisions for Design-Build Agreement” amendments, and all exhibits and attachments to such amendments;

1.2.1.4 Volume 2 “Technical Provisions for Design-Build Agreement”, and all exhibits and attachments to the Technical Provisions;

1.2.1.5 Volume 3 “Programmatic Technical Provisions for Design-Build Agreement” amendments, and all exhibits and attachments to such amendments (excluding Attachment 3-1);

1.2.1.6 Volume 3 “Programmatic Technical Provisions for Design-Build Agreement”, and all exhibits and attachments thereto, excluding Attachment 3-1;

1.2.1.7 Volume 3, Attachment 3-1 “Manuals” (Technical Documents) amendments; provided that, GDOT in its sole discretion may designate that such amendments or portions thereof take precedence over the Technical Provisions to the extent provided in Article 7.2.5;

1.2.1.8 Volume 3, Attachment 3-1 “Manuals” (Technical Documents);

1.2.1.9 DB Team’s Proposal commitments set forth in Exhibit 2 hereto, including DB Team’s Schematic Plan of Project and related Early Portions of the Work; provided that, to the extent specified in Exhibit 2, certain provisions therein shall supersede the specified provisions of the other DB Documents.
1.2.2 If the Proposal, including DB Team’s Schematic Plan of Project, includes statements, offers, terms, concepts or designs that can reasonably be interpreted as offers to provide higher quality items than otherwise required by the other DB Documents or to perform services or meet standards in addition to or better than those otherwise required, or otherwise contains terms or designs which are more advantageous to GDOT than the requirements of the other DB Documents, as reasonably determined by GDOT, then DB Team’s obligations hereunder shall include compliance with all such statements, offers, terms, concepts and designs, which shall have the priority of Agreement amendments (Article 1.2.1.1) and Technical Provisions amendments (Article 1.2.1.3), as applicable.

1.2.3 If the DB Documents contain differing provisions on the same subject matter, the provisions that establish the higher quality manner or method of performing the Work or use more stringent standards will prevail. Additional details in a lower priority DB Document shall be given effect except to the extent they irreconcilably conflict with requirements, provisions and practices contained in the higher priority DB Document. If the DB Documents contain differing provisions on the same subject matter that cannot be reconciled by applying the foregoing rules, then the provisions (whether setting forth performance or prescriptive requirements) contained in the document of higher order of precedence shall prevail over the provisions (whether setting forth performance or prescriptive requirements) contained in the document of lower order of precedence.

1.2.4 Where there is an irreconcilable conflict among any standards, criteria, requirements, conditions, procedures, specifications or other provisions applicable to the Project set forth in one or more manual(s) or publication(s) referenced within a DB Document or set of DB Documents with the same order of priority (including within documents referenced therein), the standard, criterion, requirement, condition, procedure, specification or other provision offering higher quality or better performance will apply, unless GDOT in its sole discretion approves otherwise in writing. If there is an irreconcilable conflict between manuals or publications referenced in DB Document of differing priorities, the order of precedence set forth in Article 1.2.1 will apply. If either Party becomes aware of any such conflict, it shall promptly notify the other party of the conflict in writing. GDOT shall issue a written determination respecting which of the conflicting items is to apply promptly after it becomes aware of any such conflict.

1.3 Construction and Interpretation of the DB Documents

1.3.1 The headers or captions of the Articles of this Agreement and Sections in the other DB Documents are for convenience only and shall not be deemed part of this Agreement or the DB Documents or considered in construing this Agreement or the DB Documents.

1.3.2 The language in all parts of the DB Documents shall in all cases be construed simply, as a whole and in accordance with its fair meaning and not strictly for or against any Party. The Parties hereto acknowledge and agree that the DB Documents are the product of an extensive and thorough, arm’s length exchange of ideas, questions, answers, information and drafts during the
Proposal preparation process, that each Party has been given the opportunity to independently review the DB Documents with legal counsel, and that each Party has the requisite experience and sophistication to negotiate, understand, interpret and agree to the particular language of the provisions of the DB Documents. Accordingly, in the event of an ambiguity in or Dispute regarding the interpretation of the DB Documents, the DB Documents shall not be interpreted or construed against the Party preparing it, and instead other rules of interpretation and construction shall be utilized. GDOT’s final answers to the questions posed during the Proposal preparation process for this Agreement shall in no event be deemed part of the DB Documents and shall not be relevant in interpreting the DB Documents except as they may clarify provisions otherwise considered ambiguous.

1.3.3 Reserved

1.3.4 References in this instrument to this “Agreement” mean, refer to and include this instrument as well as any riders, exhibits, addenda and attachments hereto (which are hereby incorporated herein by reference) or other documents expressly incorporated by reference in this instrument. Any references to any covenant, condition, obligation and/or undertaking “herein,” “hereunder” or “pursuant hereto” (or language of like import) mean, refer to and include the covenants, conditions, obligations and undertakings existing pursuant to this instrument and any riders, exhibits, addenda, attachments or other documents affixed to or expressly incorporated by reference in this instrument. All terms defined in this instrument shall be deemed to have the same meanings in all riders, exhibits, addenda, attachments or other documents affixed to or expressly incorporated by reference in this instrument unless the context thereof clearly requires the contrary. Unless expressly provided otherwise, all references to exhibits, articles and sections refer to same as set forth in this Agreement. Where a specific section is referenced, such reference shall include all subsections thereunder. Unless otherwise stated in this Agreement or the other DB Documents, words that have well-known technical or construction industry meanings are used in this Agreement or the other DB Documents in accordance with such recognized meaning. All references to a subsection or clause “above” or “below” refer to the denoted subsection or clause within the section in which the reference appears. Wherever the word “including,” “includes” or “include” is used in the DB Documents, it shall be deemed to be followed by the words “without limitation”. Wherever reference is made in the DB Documents to a particular Governmental Entity, it includes any public agency succeeding to the powers and authority of such Governmental Entity.

1.3.5 As used in this Agreement and the other DB Documents and as the context may require, the singular includes the plural and vice versa, and the masculine gender includes the feminine and vice versa.

1.4 Reserved

1.5 Reference Information Documents

1.5.1 DB Team acknowledges that GDOT has provided and disclosed to DB Team the Reference Information Documents (“RIDs”). The RIDs are not
mandatory or binding on DB Team. DB Team is not entitled to rely on the RIDs as presenting design, engineering, operating or maintenance solutions or other direction, means or methods for complying with the requirements of the DB Documents, Governmental Approvals or Law.

1.5.2 Except as expressly set forth herein, DB Team acknowledges that GDOT neither represents nor warrants that the information contained in the RIDs is complete or accurate or that such information is in conformity with the requirements of the DB Documents, Governmental Approvals or Laws, and GDOT is neither responsible or liable in any respect for any causes of action, claims or Losses whatsoever suffered by any DB Team-Related Entity by reason of any use of information contained in, or any action or forbearance in reliance on, the RIDs.

1.6 Errata to the GDOT Standard Specifications

In interpreting standards, policies and specifications referenced in the latest edition of the GDOT Standard Specifications, Construction of Transportation Systems, as well as the Manuals listed in Volume 3, Attachment 3-1, the following apply:

(a) References to the “Department” shall mean GDOT.

(b) References to the “Contractor” shall mean the DB Team.

(c) References to “Resident Engineer” or “Engineer” in the context of the provider of compliance judgment may mean the Designer Quality Assurance Manager or Engineer of Record, as applicable, or it may mean a GDOT representative, or any combination thereof, depending on the context, and as determined by GDOT in its sole discretion and without recourse for the DB Team.

(d) References to the “Contract” shall mean the Agreement.

(e) References to the “Inspector” shall mean a representative of the Quality Assurance Firm(s), GDOT, or both.

(f) References to “plan(s)” shall mean the DB Documents.

(g) References to “The Work” shall mean the Work.

(h) Cross-references to measurement and payment provisions contained in the referenced standards, policies and specifications shall be deemed to refer to the measurement and payment provisions contained in the DB Documents.

(i) Any conflicts, ambiguities, or lack of clarity in regard to items included in the provisions, terms, or definitions used will be interpreted and defined by GDOT in its sole discretion. The DB Team shall not take advantage of any apparent conflict, omission, ambiguity, inconsistency, inaccuracy, deficiency, or inadequacy related to the application of a requirement, action to be taken, or the definition of roles and responsibilities in the execution of the Work. Should it appear that any definition of roles and responsibilities is contrary to the philosophy of those established by the Agreement, it is the
responsibility of the DB Team to request a determination by GDOT related to the respective roles and responsibilities of the DB Team and GDOT.

Article 2 GRANT OF AUTHORITY AND RIGHT OF WAY

2.1 Grant of Authority for Undertaking

2.1.1 GDOT hereby grants to DB Team the revocable right, and DB Team accepts the obligation, to design and construct (including any maintenance obligations during such period as required pursuant to the DB Documents) the Project in accordance with the requirements of this Agreement and the other DB Documents.

2.2 Right of Way; Construction Easement; Ownership

2.2.1 The Project shall be constructed on and within the property as identified in the NEPA Approval and any amendment thereto (the “Property”). GDOT or where applicable SCDOT shall provide DB Team with access rights to the Property, together with the Existing Right of Way as set forth in this Article 2.2.

2.2.1.1 Reserved

2.2.1.2 GDOT or where applicable SCDOT reserves the right to enter upon, possess, control and utilize the Property with or without payment of compensation to DB Team in accordance with this Agreement.

2.2.1.3 GDOT or where applicable SCDOT have granted, and have further reserved the right to grant, to other parties, utility and other permits and easements and modifications thereto and rights of use to the Property subject to the limitations of the DB Documents.

2.2.2 Existing Right of Way, State Proposed/State Acquired Right of Way

2.2.2.1 Upon the terms and conditions of this Agreement, including as set forth in this Article 2.2, and subject to the terms and conditions of the DB Documents, as of the Effective Date, GDOT and SCDOT shall and does, subject to and upon issuance of NTP 1:

(a) grant to DB Team a non-exclusive right of access, ingress and egress (and the right to grant to DB Team-Related Entities a non-exclusive right of access, ingress and egress) to all real property comprising the Existing Right of Way as more particularly described and designated in Exhibit 4, subject to the exclusions and reservations set forth in this Agreement, in accordance with the terms described in the DB Documents, and

2.2.2.2 DB Team represents that it has reviewed the Existing Right of Way and confirmed that the access rights to the property and timing for the grant of such rights as identified therein are sufficient and complete so as to allow DB
Team access to all areas of the Property as required for the performance and completion of the Work.

2.2.3 Reserved

2.2.4 Reserved

**Article 3**  
**CONTRACT TIME**

**3.1 Term of Agreement**

3.1.1 This Agreement shall remain in effect until Final Acceptance, subject to the survival of all such obligations as expressly provided herein, including without limitation, any warranty periods (the “Term”); provided that this Agreement shall be subject to earlier termination in accordance with the terms of this Agreement and the DB Documents.

**3.2 Project Schedule**

3.2.1 As a material consideration for entering into this Agreement, DB Team hereby commits, and GDOT is relying upon DB Team’s commitment, to develop, design and fully construct the Project in accordance with the milestones and time periods set forth in this Agreement and the other DB Documents, including without limitation, in the Technical Provisions, the Project Schedule and Completion Deadlines, including Interim Completion Deadlines, subject only to delays caused by Relief Events specifically provided hereunder.

3.2.2 The time limitations set forth for DB Team’s performance of its covenants and obligations as required pursuant to the DB Documents, including without limitation performance of the Work as required pursuant to the Completion Deadlines, including Interim Completion Deadlines, and Project Schedule, are of the essence, and except where this Agreement expressly provides for extension of time due to a Relief Event or allows delay subject to payment of Liquidated Damages or other compensation to GDOT, DB Team waives any right at law or in equity to tender or complete performance beyond the applicable time period, or to require GDOT to accept such performance. All references to days shall mean Calendar Days unless otherwise specified.

3.2.3 DB Team shall achieve the Interim Completion Date of each Early Portion of the Work on or before each of the applicable Interim Completion Deadlines, Substantial Completion on or before the Substantial Completion Deadline and Final Acceptance on or before the Final Acceptance deadline, time being of the essence.

3.2.4 DB Team hereby represents and warrants that the Project Schedule is in the form described in the Technical Provisions, has been developed in accordance with Section 2.5 of the Technical Provisions, and is consistent with the Milestone Schedule set forth in Exhibit 9 to this Agreement. DB Team shall use the Proposal Schedule as a foundation to prepare the Project Baseline Schedule for GDOT’s review and approval, as set forth in Section 2.5 of
the Technical Provisions. The Parties shall use the Proposal Schedule for planning and monitoring the progress of the Work until such time that the Project Baseline Schedule is approved by GDOT. The proposed Project Baseline Schedule shall be consistent with the Proposal Schedule and Milestone Schedule except to the extent for adjustments as provided in the DB Documents and as approved by GDOT.

3.2.5 All Float contained in the Project Schedule shall be considered a shared resource among GDOT and the DB Team, available to any or all such parties as needed to absorb delay caused to the Critical Path components as set forth in the Project Schedule or Milestone Schedule deadlines, whether on account of Relief Events or other events of delay not constituting Relief Events. All Float shall be shown as such in the Project Schedule on each affected schedule path. GDOT shall have the right to examine the identification of (or failure to identify) Float on the Project Schedule in determining whether to approve or accept the Project Schedule. Once identified, DB Team shall monitor and account for Float in accordance with Critical Path methodology.

3.3 Contract Time, Date of Commencement, and Notice to Proceed

3.3.1 DB Team’s time period for completion of the Work is the period from the Effective Date through the Final Acceptance Date, as may be adjusted for any Relief Event as expressly provided in the Agreement (the “Contract Time”). All Work shall be performed in accordance with the Milestone Schedule attached as Exhibit 9.

3.3.1.1 GDOT anticipates issuing NTP 1 promptly following the Effective Date, and shall in any case provide for issuance of NTP 1 within thirty (30) days from DB Team’s satisfaction of the conditions for execution of the Agreement. Issuance of NTP 1 authorizes DB Team to commence preliminary design activities. Title 23, Code of Federal Regulations (CFR), Section 636.103 (23 CFR Section 636.103) defines preliminary design to include, but is not limited to, preliminary engineering and other activities and analyses, such as topographic surveys, metes and bounds surveys, geotechnical investigations, hydrologic analysis, hydraulic analysis, utility engineering, traffic studies, financial plans, revenue estimates, hazardous materials assessments, general estimates of the types and quantities of materials, and other Work needed to establish the parameters for the Final Design. Prior to completion of the Environmental Documents review process, any such preliminary engineering and other activities and analyses must not materially affect the objective consideration of alternatives in the Environmental Documents review process. Preliminary design activities shall be completed in accordance with the Management Plans, the Technical Provisions, and other activities anticipated to be performed after NTP 1, including satisfying the conditions to issuance of NTP 3 under Article 3.3.1.3.

3.3.1.2 Issuance of NTP 2 authorizes the DB Team to perform all NTP 1 activities, Final Design activities, and any other activities required for start of the Construction Work. Title 23, CFR, Section 636.103 (23 CFR Section 636.103) defines Final Design as any design activities following preliminary design and expressly includes the preparation of final construction Plans and detailed specifications for the performance of Construction Work. NTP 2 will be issued once
the Environmental Documents are approved, or with NTP 1 if the Environmental Documents have been approved by the Agreement execution date.

3.3.1.3 Issuance of NTP 3, also referred to as Released for Construction (“RFC”), authorizes DB Team to perform all other Work and activities pertaining to the Project, subject to conforming RFC Plans as may be related to commencement of any Element of the Construction Work. DB Team may not proceed to commence any construction activity with respect to the Project except as authorized pursuant to an RFC. An RFC may be issued for the entire project or any Construction Phase of the project. GDOT anticipates issuing NTP 3 after GDOT’s issuance of Right of Way certification and within five (5) days from DB Team’s satisfaction of the following conditions:

(a) Submittal by DB Team to GDOT and acceptance by GDOT of the Project Quality Management Plan and other Quality Management Plans in accordance with Article 9 of this Agreement and Section 2.3 of the Technical Provisions;

(b) Submittal by DB Team to GDOT and acceptance by GDOT of DB Team’s Safety Plan under Section 2.4 of the Technical Provisions;

(c) Submittal by DB Team to GDOT and acceptance by GDOT of DB Team’s Released for Construction Plans for the phases of the Project under Section 3 of the Technical Provisions;

(d) Submittal by DB Team to GDOT and acceptance by GDOT of DB Team’s proposed Schedule of Values under Section 2.5 of the Technical Provisions;

(e) Submittal by DB Team to GDOT and acceptance by GDOT of the DB Team’s proposed Project Baseline Schedule under Section 2.5 of the Technical Provisions;

(f) Submittal by DB Team to GDOT and acceptance by GDOT of DB Team’s Traffic Control Plan under Section 18.3 of the Technical Provisions for the approved Project Phase;

(g) Submittal by DB Team to GDOT and acceptance by GDOT of DB Team’s Transportation Management Plan under Section 18.2 of the Technical Provisions;

(h) Submittal by DB Team to GDOT and acceptance by GDOT of the Public Information and Communications Plan (PICP) under Section 2.7.2 of the Technical Provisions;

(i) Submittal by DB Team to GDOT and acceptance by GDOT of DB Team’s Construction Phasing Plan of Project under Section 2.2.5 of the Technical Provisions;
3.3.1.4 Notwithstanding any provision to the contrary in this Article 3.3, DB Team shall not perform, nor be obligated to perform, any portion of the Work prior to issuance of approval of the Environmental Documents, except for Work authorized under 23 C.F.R. 636.103, Preliminary Work.

3.3.2 DB Team shall satisfy all conditions prior to issuance of NTP 3. DB Team shall satisfy all conditions to commencement of the Construction Work and commence such Construction Work with diligence and continuity, by the deadlines therefor set forth in Milestone Schedule attached as Exhibit 9, and any adjustments set forth therein, all as the same may be extended pursuant to this Agreement.
3.3.3 Prior to the start of any Construction Work, the DB Team shall satisfy all conditions set forth in Section 2 and Section 3 of the Technical Provisions.

Article 4  CONTROL OF THE WORK

4.1 DB Team Quality Management

The DB Team shall perform the quality control, that is all operation techniques and activities performed or conducted to fulfil the contract requirements, and quality management necessary to meet its obligations under the DB Documents and in accordance with GDOT Standard Specification 105.

4.2 Reserved

4.3 Reserved

4.4 Limitations on DB Team’s Right to Rely

4.4.1 No review, comment, objection, rejection, acceptance, disapproval, acceptance, certification (including certificates of Substantial Completion and Final Acceptance), concurrence, monitoring, testing, verification sampling, inspection, spot checking, auditing or other oversight by or on behalf of GDOT or their representatives or agents, and no lack thereof by GDOT, or their representatives or agents, shall constitute acceptance of materials or Work or waiver of any legal or equitable right under the DB Documents, at Law, or in equity. GDOT shall be entitled to remedies for Nonconforming Work and to identify additional Work which must be done to bring the Work and Project into compliance with requirements of the DB Documents, regardless of whether previous review, comment, objection, rejection, acceptance, disapproval, acceptance, certification, concurrence, monitoring, testing, inspection, spot checking, auditing or other oversight were conducted or given by GDOT, or their representatives or agents. Regardless of any such activity or failure to conduct any such activity by GDOT, or its representatives or agents, DB Team at all times shall have an independent duty and obligation to fulfill the requirements of the DB Documents. DB Team agrees and acknowledges that any such activity or failure to conduct any such activity by GDOT, or their representatives or agents:

(a) is solely for the benefit and protection of GDOT;

(b) does not relieve DB Team of its responsibility for the selection and the competent performance of all DB Team-Related Entities;

(c) does not create or impose upon GDOT any duty or obligation toward DB Team to cause it to fulfill the requirements of the DB Documents;

(d) shall not be deemed or construed as any kind of warranty, express or implied, by GDOT;

(e) may not be relied upon by DB Team or used as evidence in determining whether DB Team has fulfilled the requirements of the DB Documents;
(f) may not be asserted by DB Team against GDOT as a defense, legal or equitable, to, or as a waiver of or relief from, DB Team's obligation to fulfill the requirements of the DB Documents; and

(g) shall not be deemed or construed as any assumption of risk by GDOT as to the quality of Work or materials.

4.4.2 DB Team shall not be relieved or entitled to reduction of its obligations to perform the Work in accordance with the DB Documents, or any of its other liabilities and obligations, including its indemnity obligations, as the result of any activity identified in Article 4.4.1 or failure to conduct any such activity by GDOT. Such activity by GDOT shall not relieve DB Team from liability for, and responsibility to cure and correct Nonconforming Work or DB Team Defaults.

4.4.3 To the maximum extent permitted by Law, DB Team hereby releases and discharges GDOT from any and all duty and obligation to cause DB Team's Work or the Project to satisfy the standards and requirements of the DB Documents. GDOT is an intended third-party beneficiary of this Article 4.4.

4.4.4 Notwithstanding the provisions of Articles 4.4.1, 4.4.2 and 4.4.3:

(a) DB Team shall be entitled to rely on written approvals, acceptances, lack of responses from GDOT (i) for the limited purpose of establishing that the approval, acceptance or lack of response occurred or (ii) that are within its sole discretion, but only to the extent that DB Team is prejudiced by a subsequent decision of such party to rescind such approval or acceptance;

(b) DB Team shall be entitled to rely on the certificates of Substantial Completion and Final Acceptance from GDOT for the limited purpose of establishing that Substantial Completion and Final Acceptance, as applicable, have occurred, and the respective dates thereof;

(c) GDOT is not relieved from any liability arising out of a knowing and intentional material misrepresentation under any written statement GDOT delivers to DB Team; and

(d) GDOT is not relieved from performance of its express responsibilities under the DB Documents in accordance with all standards applicable thereto.

4.5 Inspection and Testing; Limitations

4.5.1 At all times during the term of this Agreement, GDOT shall have the right to conduct testing, acceptance testing, materials sampling and testing, oversight inspection, acceptance inspection, monitoring, verification, and validation, of DB Team's Work, as well as auditing and other oversight functions set forth in the DB Documents, including without limitation:

(a) monitoring and auditing DB Team and its processes, books and records, and deliverables to determine compliance with requirements of the DB Documents and the accepted Management Plans, including audit review of Design Documents, Plans, Construction Documents and other Submittals;
(b) conducting field monitoring and inspections on an audit basis as indicated in the DB Documents, including in connection with GDOT’s certifications of Substantial Completion and Final Acceptance;

(c) develop quality reports, regular audit reports, reports on Defects, other reports, and findings, opinions, evaluations, comments, objections and recommendations, all as more particularly set forth in the DB Documents;

(d) reviewing and commenting on all Submittals for which GDOT review and comment or acceptance is required under the DB Documents, unless expressly provided otherwise in the DB Documents, or unless waived in writing by the Parties for a specific Submittal or type of Submittal;

(e) attending and witnessing DB Team’s tests and inspections;

(f) auditing the books and records of Key Contractors to confirm compliance with the DB Documents and applicable Law;

(g) investigating, analyzing and reporting on Safety Compliance and performance of Safety Compliance Orders; and

(h) reviewing, commenting on and giving recommendations, objections or disapprovals regarding the Project Payment Request and revisions thereto, and processing such Project Payment Request.

4.5.2 GDOT shall have the right to attend and witness any tests and verifications to be conducted pursuant to the Technical Provisions and applicable Management Plans. DB Team shall provide to GDOT all applicable test results and reports (which may be provided in electronic format in accordance with the Technical Provisions) within ten (10) days after DB Team receives them.

4.6 Oversight by GDOT for FHWA and Federal Compliance

4.6.1 In addition to GDOT’s rights of oversight, inspection, monitoring and auditing of DB Team’s Work, GDOT shall independently have the right at all times to monitor, inspect, sample, measure, attend, observe or conduct tests and investigations, and conduct any other oversight respecting any part or aspect of the Project or the Work, to the extent necessary or advisable (a) to comply with FHWA, U.S. Army Corps of Engineers or other applicable federal agency requirements, and (b) to verify on an audit basis DB Team’s compliance with the DB Documents and Management Plans as provided in Article 22.2.

4.6.2 DB Team acknowledges and agrees that GDOT will have the right to audit, monitor and inspect DB Team and its Contractors compliance with Good Industry Practice and its responsibilities and obligations under the DB Documents.

4.6.3 GDOT will not conduct formal prior reviews of Design Documents except to the extent necessary or advisable to comply with FHWA, U.S. Army Corps of Engineers or other applicable federal agency requirements, provided that the aforementioned shall not limit GDOT’s rights pursuant to this Agreement.
FHWA and GDOT reserve the right to conduct “over-the-shoulder” reviews of Design Documents or other Submittals as they may deem necessary or appropriate, including pursuant to Article 17.3.8, provided that they shall not have any obligation to conduct such reviews nor assume any responsibility for DB Team's Work, regardless of whether or not electing to perform or performing any such reviews.

4.6.4 Nothing in the DB Documents shall preclude, and DB Team shall not interfere with, any review, audit or oversight of Submittals, Work or books and records that the GDOT or FHWA may desire to conduct.

4.7 Rights of Cooperation and Access; Increased Oversight

4.7.1 DB Team shall coordinate and cooperate, and require its Contractors to coordinate and cooperate, with GDOT and any such parties as provided in Article 4.5 and Article 4.6 to facilitate the full, efficient, effective and timely performance of all such monitoring, inspection, sampling, measuring, testing, reporting, auditing, and other oversight functions. DB Team shall cause its representatives to be available at all reasonable times for consultation with GDOT and such other parties as required.

4.7.2 Without limiting the foregoing and subject to GDOT complying with DB Team's reasonable safety requirements, DB Team shall afford GDOT (a) safe and unrestricted access to the Project at all times, (b) safe access during normal business hours to DB Team's Project offices and operations buildings, (c) safe access during normal business hours to the Project Specific Locations and (d) unrestricted access to data respecting the Project design, construction, operations and maintenance, and the Utility Adjustment Work. Without limiting the foregoing, DB Team shall deliver to GDOT upon request accurate and complete books, records, data and information regarding Work, the Project and the Utility Adjustment Work, in the format required by the Technical Provisions.

4.7.3 GDOT shall have the right to increase the type and level of their oversight as provided in Article 4.6 and Article 17.3.8.

4.8 Limits of Responsibility for Oversight, Review, Recommendations, Inspection and Acts by GDOT

4.8.1 Although GDOT, and its representatives and agents, may consult with DB Team during the course of the Work, no such party shall have control over, charge of, or responsibility for any of the Work, including without limitation, any design or engineering thereof, or means, methods, techniques, sequences or procedures in connection therewith, nor shall any such party be responsible for DB Team's failure to perform the Work in accordance with the requirements of the DB Documents. Any such review is not for the purpose of determining the accuracy and completeness of information or work product, all of which are DB Team's responsibility. Any review, recommendation, acceptance, inspection, response, act or omission with respect to any Submittals, or with respect to the Project, the Work (whether Construction Work or Design Work), or the Construction Documents shall be pursuant to, and solely in furtherance of the inspection powers as set forth in O.C.G.A. § 50-21-24(8).
4.8.2 DB Team shall, at all times and notwithstanding any such acts or omissions by GDOT as provided in this Article 4 or elsewhere in this Agreement, be fully responsible for all architectural design and engineering required for the Project. DB Team expressly waives and releases (a) all claims for right of contribution against either GDOT, or its respective representatives and agents, other than for such parties’ sole negligence, arising from or related to any third-party claims, including without limitation for personal injury, death, or property damage, and (b) all claims and defenses by DB Team against either GDOT, or its respective representatives and agents in derogation of the limitations of this Article 4, including this Article 4.8, and/or that any or all of such parties otherwise have, or by their acts or omissions, assumed any responsibility for, or related to, the design or construction of the Project, or any means, methods, or techniques in respect thereof. DB Team hereby further expressly waives any claim or defense the basis of which is to assert that GDOT may not delegate the responsibility for any Element of the design and construction of the Project involving public roadways, signs, or traffic controls to DB Team as provided in this Agreement.

Article 5 CONTRACT SUM, PAYMENTS, AND PUBLIC FUNDS

5.1 Payment of Contract Sum

5.1.1 GDOT shall pay DB Team the Contract Sum for Work properly performed in accordance with the DB Documents and the terms and conditions set forth in GDOT Standard Specifications, Section 109. DB Team, in consideration for all Work performed in accordance with the DB Documents, shall be entitled to receive the Contract Sum, which amount is inclusive of all fees, overhead, profit, insurance and bond premiums, labor and material costs, installations, delivery, warehouse and handling charges, duties, taxes and other assessments.

5.2 Reserved

5.3 GDOT Monetary Obligations and Overall Limitation of Liability

5.3.1 Notwithstanding anything to the contrary in the DB Documents, in no event shall GDOT’s outstanding liability to DB Team under the DB Documents, including liability related to Compensation Events and Compensation Amounts, exceed the amount of compensation that would be payable to DB Team pursuant to a Termination for Convenience under Article 19.1.

5.3.2 The payment of any moneys owed by GDOT under the DB Documents, including without limitation amounts payable in connection with a termination, upon the occurrence of a GDOT Event of Default, or in any suit for monetary damages alleging breach of this Agreement by GDOT, shall be limited to funds available to GDOT for such payments.

5.3.3 Reserved

5.3.4 Reserved
Article 6  PROJECT PLANNING AND ACCEPTANCES; PROJECT ADMINISTRATION, REVIEW AND OVERSIGHT; PUBLIC INFORMATION

6.1  Preliminary Planning and Engineering Activities; Site Conditions

6.1.1  DB Team shall perform or cause to be performed all architectural and engineering activities appropriate for design and construction of the Project in accordance with Good Industry Practice and the DB Documents, which may include, subject to the scope of Work set forth in the DB Documents or as required by GDOT by Supplemental Agreement or Directive Letter: (a) Utility Adjustments (b) technical studies and analyses; (c) geotechnical investigations; (d) right of way mapping, surveying and appraisals; (e) Subsurface Utility Engineering (SUE) investigations and mapping; (f) Hazardous Materials investigations; and (g) design and construction surveys.

6.1.2  Except to the extent that DB Team is entitled to a Relief Event and/or a Compensation Event under this Agreement, DB Team shall bear the risk of any incorrect or incomplete review, examination and investigation by it of the Site or the Existing Improvements and surrounding locations, and of any incorrect or incomplete information resulting from preliminary architectural and engineering activities conducted by DB Team, GDOT, or any other Person. DB Team acknowledges and agrees that GDOT makes no warranties or representations as to any surveys, data, reports or other information provided by GDOT or other Persons concerning surface conditions and subsurface conditions, including the presence of Utilities, Hazardous Materials, contaminated groundwater, archeological, paleontological and cultural resources, and Threatened or Endangered Species, affecting the Site, the Existing Improvements, or surrounding locations. DB Team acknowledges that such information is for DB Team’s reference only and has not been verified.

6.1.3  Except to the extent that DB Team is entitled to a Relief Event and/or a Compensation Event under this Agreement, DB Team shall bear the risk of all conditions occurring on, under or at the Site and the Existing Improvements, including (a) physical conditions of an unusual nature, differing materially from those ordinarily encountered in the area, (b) changes in surface topography, (c) variations in subsurface moisture content, (d) Utility facilities, (e) the discovery at, near or on the Property of any archeological, paleontological or cultural resources, and (f) the discovery at, near or on the Property of any Threatened or Endangered Species.

6.2  Governmental Approvals and Third-Party Agreements

6.2.1  GDOT retains responsibility for obtaining all Provided Approvals based on the design schematic contained in the NEPA Approvals. GDOT shall deliver to DB Team true and complete copies of all Provided Approvals. DB Team shall obtain all other Governmental Approvals and, except to the extent the DB Documents expressly provide GDOT is responsible therefor, all third-party approvals and agreements required in connection with the Project or the Work, including any modifications, renewals and extensions of the Provided Approvals (including those required in connection with a Compensation Event). DB Team shall deliver to GDOT true and complete copies of all new or amended...
Governmental Approvals and third-party approvals and agreements. In no event shall GDOT be responsible or liable for any delays in obtaining Provided Approvals to the extent such delays are caused by differences between the schematic contained in the NEPA Approvals and DB Team’s Final Design, unless such differences are due to a GDOT Change.

6.2.2 Prior to submitting to a Governmental Entity any application for a Governmental Approval (or any proposed modification, renewal, extension or waiver of a Governmental Approval or provision thereof), DB Team shall submit the same, together with any supporting environmental studies and analyses, to GDOT (a) for acceptance or (b) for review and comment, as specified in the Technical Provisions in Table 4-2.

6.2.3 Except as expressly set forth in this Agreement to the contrary, in the event DB Team’s design differs from the schematic contained in the approved Environmental Documents upon which the Provided Approvals were based, as among GDOT and DB Team, DB Team shall support necessary actions, and shall bear all risk of delay, resulting from or arising out of any associated change in the Project location and design, including (a) conducting all necessary environmental studies and preparing all necessary Environmental Documents in compliance with applicable Environmental Laws, and (b) obtaining and complying with all necessary new Governmental Approvals (including any modifications, renewals and extensions of the Provided Approvals, and other existing Governmental Approvals). GDOT and FHWA will independently evaluate all environmental studies and documents and fulfill the other responsibilities assigned to them by 23 CFR Part 771.

6.2.4 Subject to clauses of Article 14.2 for Compensation Event and clauses of Article 14.1 for Relief Event and except to the extent required under the Technical Provisions, in the event DB Team is unable to obtain necessary Governmental Approvals for any design that differs from the schematics contained in the approved Environmental Documents upon which Provided Approvals were based, DB Team shall be obligated to design and construct the Project according to a design in compliance with the requirements of the Provided Approvals, and no such circumstance shall constitute a Relief Event or Compensation Event.

6.2.5 At DB Team’s request, GDOT shall reasonably assist and cooperate with DB Team in obtaining from Governmental Entities the Governmental Approvals (including any modifications, renewals and extensions of existing Governmental Approvals from Governmental Entities) required to be obtained by DB Team under the DB Documents.

6.2.5.1 GDOT and DB Team shall work jointly to establish a scope of work and budget for GDOT Recoverable Costs related to the assistance and cooperation GDOT will provide as contemplated herein, subject to any rights of DB Team in the case of a Compensation Event.

6.2.5.2 Such costs and expenses shall be subject to the limitations for GDOT Recoverable Costs provided however that, notwithstanding the limitations of subpart (a) in the definition of GDOT Recoverable Costs, such reimbursable
amounts shall expressly include costs and expenses incurred to conduct further or supplemental environmental studies as a result of (i) any DB Team Proposed Right of Way or (ii) DB Team Release(s) of Hazardous Material.

6.2.6 DB Team shall comply with all conditions imposed by and undertake all actions required by and all actions necessary to maintain in full force and effect all Governmental Approvals, including performance of all environmental mitigation measures required by the DB Documents or Governmental Approvals and including payment of mitigation credits and any other fees required for Governmental Approvals, except to the extent that responsibility for performance of such measures and payment is expressly assigned to GDOT in the DB Documents.

6.2.7 In the event that any Governmental Approvals required to be obtained by DB Team must formally be issued in GDOT’s name, DB Team shall undertake necessary efforts to obtain such approvals subject to GDOT’s reasonable cooperation with DB Team, as the case may be, at DB Team’s expense (except in connection with a Compensation Event), in accordance with Article 6.2.5, including execution and delivery of appropriate applications and other documentation in form accepted by GDOT. Refer to Section 4.2 of the Technical Provisions for more specific provisions on applications in GDOT’s name for Environmental Approvals.

6.2.8 In the event that GDOT or FHWA must act as the lead agency and directly coordinate with a Governmental Entity in connection with obtaining Governmental Approvals which are the responsibility of DB Team, DB Team shall provide all necessary support to facilitate the approval, mitigation or compliance process. Such support may include conducting necessary field investigations, surveys, and preparation of any required reports, documents and applications.

6.2.9 DB Team shall be responsible for compliance with all applicable Laws in relation to Project Specific Locations and Additional Properties for obtaining any Environmental Approval or other Governmental Approval required in connection with Project Specific Locations.

6.2.10 DB Team shall not enter into any agreement with any Governmental Entity, Utility Owner, railroad, property owner or other third party having regulatory jurisdiction over any aspect of the Project or Work or having any property interest affected by the Project or the Work that in any way purports to obligate GDOT, or the State or an agency or department thereof, or states or implies that GDOT has an obligation, to the third party to carry out any installation, design, construction, maintenance, repair, operation, control, supervision, regulation or other activity after the end of the Term, unless GDOT otherwise accepts in writing in its sole discretion. DB Team has no power or authority to enter into any such agreement with a third party in the name or on behalf of GDOT.
6.3 Review and Oversight

6.3.1 Submittal, Review and Acceptance Terms and Procedures

6.3.1.1 This Article 6.3 sets forth uniform terms and procedures that shall govern all Submittals pursuant to the DB Documents and component plans thereunder. In the event of any irreconcilable conflict between the provisions of this Article 6.3 and any other provisions of the DB Documents and component plans thereunder concerning submission, review and acceptance, rejection, or approval procedures, this Article 6.3 shall exclusively govern and control, except to the extent that the conflicting provision expressly states that it supersedes this Article 6.3.

6.3.2 Time Periods

6.3.2.1 Except as expressly set forth elsewhere in the DB Documents or as provided below, whenever GDOT is entitled to review and comment, approve, or accept a Submittal, GDOT shall promptly respond within thirty (30) days from the date it receives an accurate and complete Submittal, together with a completed transmittal form, in form to be mutually agreed upon, and all necessary information and documentation concerning the subject matter included. Any period of review by GDOT more than thirty (30) days, or as specifically set forth elsewhere in the DB Documents providing for a different time period, may be deemed a GDOT Caused-Delay and give rise to Relief Event, subject to the provisions and satisfying all DB Document requirements for Relief Events. The time periods set forth in the DB Documents for GDOT’s review and acceptance or approval of Submittals, as and to the extent required shall apply to and restart with all re-submittals which DB Team may be required to provide.

6.3.2.2 The time periods set forth herein with respect to GDOT’s review and acceptance, rejection, or approval, or comment on Submittals shall be subject to adjustment as provided in Section 3 of the Technical Provisions for multiple concurrent Submittals.

6.3.2.3 All time periods for GDOT to act upon Submittals shall be extended by the period of any delay caused by any Relief Event impacting same, including as set forth in clauses of Article 14.1 for Relief Event or otherwise as and to the extent of any delay of DB Team or any DB Team-Related Entity.

6.3.2.4 During any time that GDOT is entitled under Article 17.3.8 to increase the level of its auditing, monitoring, inspection, sampling, measuring, testing and oversight of the Project, the Utility Adjustments and DB Team’s compliance with its obligations under the DB Documents, the applicable period for GDOT to act on any Submittals received during such time and not related to curing the DB Team Default(s) that instigated the Article 17.3.8 action shall automatically be extended by fourteen (14) days.

6.3.2.5 GDOT shall endeavor to reasonably accommodate a written request from DB Team for expedited action on a specific Submittal, within the practical limitations on availability of personnel appropriate for acting on the types of Submittal in question; provided DB Team sets forth in its request specific,
abnormal circumstances demonstrating the need for expedited action. This provision shall not apply, however, during any time described in Articles 6.3.2.3 and Article 6.3.2.4.

6.3.3 GDOT Discretionary Acceptances

If the Submittal is one where the DB Documents indicate approval or acceptance is required from GDOT in its sole discretion, then GDOT’s lack of determination, decision, or other action within the applicable time period under Article 6.3.2 shall be deemed non-acceptance.

6.3.4 Other GDOT Acceptances

6.3.4.1 Whenever the DB Documents indicate that a Submittal or other matter is subject to GDOT’s approval or acceptance, and no particular standard therefor is stated, then the standard shall be reasonableness.

6.3.4.2 If the reasonableness standard applies to GDOT’s right of approval or acceptance of a Submittal, and GDOT delivers no approval or acceptance within the applicable time period under Article 6.3.2, then DB Team may deliver to GDOT a written notice stating the date within which GDOT was to have decided or acted. If GDOT does not respond or act within seven (7) days after receipt of the notice, then a delay may constitute GDOT-Caused Delay under Article 14, subject to the provisions and satisfying all DB Document requirements for Relief Events and Compensation Events. Regardless of the actual days of delay, the start of any GDOT-Caused Delay shall be measured from fourteen (14) days from the end of the last review period for that Submittal. DB Team hereby agrees to plan for and account for such notice periods within the Project Schedule.

6.3.4.3 If GDOT requires an approval of a Submittal, such approval is a formal conditional determination in writing by GDOT that a particular matter, Submittal, or item is good or satisfactory for the Project. Such determination may be based on requirements or commitments beyond those set forth in the DB Documents and may reflect preferences of GDOT.

6.3.5 GDOT Review and Comment

6.3.5.1 Whenever the DB Documents indicate that a Submittal or other matter is subject to GDOT’s review, comment, review and comment, disapproval or similar action not entailing a prior approval or acceptance and GDOT delivers no comments, exceptions, objections, rejections or disapprovals within the applicable time period under Article 6.3.2, then DB Team may proceed thereafter at its election and risk, without prejudice to GDOT’s rights to later object, reject, or disapprove.

6.3.5.2 No such failure or delay by GDOT in delivering comments, exceptions, objections, rejections or disapprovals within the applicable time period under Article 6.3.2 shall constitute a GDOT-Caused Delay, GDOT Change, Relief Event or Compensation Event.
6.3.5.3 When used in the DB Documents, the phrase “completion of the review and comment process” or similar terminology means either (a) GDOT has reviewed, provided comments, exceptions, objections, rejections or disapprovals, and all the same have been resolved, or (b) the applicable time period has passed without GDOT providing any comments, exceptions, objections, rejections or disapprovals.

6.3.6 Submittals Not Subject to Prior Review, Comment or Acceptance

Whenever the DB Documents indicate that DB Team is to deliver a Submittal to GDOT but express no requirement for GDOT review, comment, disapproval, prior acceptance or other GDOT action, then DB Team is under no obligation to provide GDOT any period of time to review the Submittal or obtain acceptance of it before proceeding with further Work, and GDOT shall have the right, but is not obligated, to at any time review, comment on, take exception to, object to, reject or disapprove the Submittal. No failure or delay by GDOT in delivering comments, exceptions, objections, rejections or disapprovals with respect to any Submittal as set forth in this Article 6.3 shall constitute a Relief Event or Compensation Event.

6.3.7 Resolution of GDOT Comments and Objections

6.3.7.1 If the Submittal is one not governed by Article 6.3.3 or Article 6.3.6, GDOT’s exception, objection, rejection or disapproval shall be deemed reasonable, valid and binding if based on any of the following grounds:

(a) The Submittal or subject provision thereof fails to comply with any applicable covenant, condition, requirement, commitment, term, or provision of the DB Documents or Management Plans thereunder;

(b) The Submittal or subject provision thereof is not to a standard equal to or better than the requirements of Good Industry Practice;

(c) DB Team has not provided all content or information required in respect of the Submittal or subject provisions thereof, provided that GDOT assumes no duty, obligation or liability regarding completeness or correctness of any Submittal, including a Submittal that is to be delivered to a Governmental Entity as a proposed Governmental Approval, or in order to obtain, modify, amend, supplement, renew, extend, waive or carry out a Governmental Approval;

(d) Adoption of the Submittal or subject provision thereof, or of any proposed course of action thereunder, would result in a conflict with or violation of any Law or Governmental Approval; or

(e) In the case of a Submittal that is to be delivered to a Governmental Entity as a proposed Governmental Approval, or in order to obtain, modify, amend, supplement, renew, extend, waive or carry out a Governmental Approval, it proposes commitments, requirements, actions, terms or conditions that are not arrangements that GDOT offers or accepts for addressing similar circumstances affecting its own projects.
6.3.7.2 DB Team shall timely and promptly respond to all of GDOT’s comments and objections to a Submittal and, except as provided below, make modifications to the Submittal as necessary to fully reflect and resolve all such comments and objections, in accordance with the review processes set forth in this Article 6.3. DB Team acknowledges that GDOT may provide comments and objections which reflect concerns regarding interpretation or preferences of the commenter or which otherwise do not directly relate to grounds set forth in Article 6.3.7.1. DB Team agrees to undertake reasonable efforts to accommodate or otherwise resolve any such comments or objections through the review processes described in this Article 6.3.

6.3.7.3 If DB Team fails to notify GDOT within such time period, GDOT may deliver to DB Team a written notice stating the date by which DB Team was to have addressed GDOT’s comments and that if DB Team does not address those comments within five (5) Business Days after receipt of this notice, then that failure shall constitute DB Team’s agreement to make all changes necessary to accommodate and resolve the comment or objection and full acceptance of all responsibility for such changes without right to a Relief Event or Compensation Event.

6.3.7.4 The foregoing shall in no way be deemed to obligate DB Team to incorporate any comments or resolve objections that would render the Submittal erroneous, defective or less than Good Industry Practice, except pursuant to a GDOT Change.

6.3.7.5 After GDOT receives DB Team’s explanation as to why the modifications are not required as provided in Article 6.3.7.2, Article 6.3.7.3 and Article 6.3.7.4, the Parties shall attempt in good faith to resolve the Dispute. If they are unable to resolve the Dispute, it shall be resolved according to Article 17.7 except (a) as provided otherwise in Article 6.3.3, and (b) if GDOT elects to issue a Directive Letter pursuant to Article 13.1 with respect to the disputed matter, the DB Team shall proceed in accordance with GDOT’s directive while retaining any claim as to the disputed matter.

6.4 Community Outreach and Public Information

DB Team shall provide on-going information to the public concerning the development of the Project, in accordance with the Public Information and Communications Plan prepared by DB Team pursuant to Section 2.7 of the Technical Provisions, if applicable.

Article 7 DEVELOPMENT OF THE PROJECT

7.1 General Obligations of DB Team

DB Team, in addition to performing all other requirements of the DB Documents, shall:

7.1.1 Furnish all design, engineering and other services, provide construction management and all work, including all materials, equipment, labor, and installations, and undertake all efforts necessary or appropriate (excluding only those materials, services and efforts which the DB Documents expressly
specify will be undertaken by GDOT or other Persons) to construct the Project and maintain it during construction, so as to achieve Substantial Completion and Final Acceptance by the applicable Milestone Schedule Deadlines;

7.1.2 At all times provide a Project Manager approved by GDOT who (a) will have full responsibility for the prosecution of the Work, including Design Work and Construction Work, (b) will act as agent and be a single point of contact in all matters on behalf of DB Team, (c) will be present (or his/her designee approved by GDOT will be present) at the Site at all times that Design Work or Construction Work is performed, and (d) will be available to respond to GDOT;

7.1.3 Comply with, and require that all Contractors comply with, all requirements of all applicable Laws;

7.1.4 Cooperate with GDOT and Governmental Entities with jurisdiction in all matters relating to the applicable portions of the Work, including Design Work and Construction Work for the Project, including their review, inspection and oversight of the design and construction; and

7.1.5 Use commercially reasonable efforts to mitigate delay to design and construction of the Project and mitigate damages due to delay in all circumstances, to the extent possible, including by re-sequencing, reallocating, or redeploying DB Team's and its Contractors' forces to other work.

7.2 Performance, Design and Construction Standards

7.2.1 DB Team shall furnish all aspects of the Design Work and all Design Documents, and shall construct the Project and perform the Construction Work as designed, free from Defects, and in accordance with (a) Good Industry Practice, (b) the requirements, terms and conditions set forth in the DB Documents, (c) the Project Schedule, (d) all Laws, (e) the requirements, terms and conditions set forth in all Governmental Approvals, and (f) the requirements of the accepted Quality Management Plan (QMP) or to be prepared thereunder, in each case taking into account the Existing Right of Way, Required Right of Way, and any Additional Property limits and other constraints affecting the Project and the Property.

7.2.2 Reserved

7.2.3 DB Team acknowledges that prior to the Effective Date it had the opportunity to identify any provisions of the Technical Provisions or Technical Documents that are erroneous or create a potentially unsafe condition, and the opportunity and duty to notify GDOT in writing of such fact and of the changes to the provision that DB Team believed were the minimum necessary to render it correct and safe. If it is reasonable or necessary to adopt changes to the Technical Provisions or Technical Documents after the Effective Date to make the provisions correct and safe, such changes shall not be grounds for a Relief Event or Compensation Event unless (a) DB Team neither knew nor had reason to know prior to the Effective Date that the provision was erroneous or created a potentially unsafe condition or (b) DB Team knew of and reported to GDOT the erroneous or potentially unsafe provision prior to the Effective Date and GDOT did not adopt
reasonable and necessary changes. Except for a circumstance as set forth under (b) herein, if DB Team commences or continues any Design Work or Construction Work affected by such a change after the need for the change was discovered or suspected, or should have been discovered or suspected through the exercise of reasonable care, DB Team shall bear any additional costs associated with redoing the Work already performed. Inconsistent or conflicting provisions of the DB Documents shall not be treated as erroneous provisions under this Article 7.2.3, but instead shall be governed by Article 1.2.

7.2.4 References in the Technical Provisions or Technical Documents to manuals or other publications governing the Design Work or Construction Work prior to the Substantial Completion Date shall mean the most recent editions in effect at the date of the RFP advertisement, unless expressly provided otherwise. Any changes to the Technical Provisions and Technical Documents, including Safety Standards, respecting Design Work or Construction Work prior to the Substantial Completion Date shall be subject to the Supplemental Agreement process for a GDOT Change in accordance with Article 13. Safety Compliance changes shall be in accordance with Article 12.1.

7.2.5 The Parties anticipate that from time to time after the Effective Date, GDOT will adopt, through revisions to existing manuals and publications or new manuals and publications, changed, added or replacement standards, criteria, requirements, conditions, procedures, specifications and other provisions, including Safety Standards, relating to Design Work and Construction Work. GDOT shall have the right to add such changed, added or replacement standards, criteria, requirements, conditions, procedures, specifications and other provisions, including Safety Standards, to Volume 3 by notice to DB Team, whereupon they shall constitute amendments, and become part, of the Technical Documents. If such changed, added or replacement Technical Documents or Safety Standards encompass matters that are addressed in the Technical Provisions or Technical Documents as of the Effective Date, they may, upon inclusion in Volume 3, replace and supersede inconsistent provisions of the Technical Provisions and Technical Documents to the extent designated by GDOT in its sole discretion. GDOT will identify the superseded provisions in its notice to DB Team. Notwithstanding the foregoing, in the absence of a GDOT Change and except as provided otherwise in Article 7.5.3 with respect to Adjustment Standards, if GDOT adopts the changed, added or replacement standards, criteria, requirements, conditions, procedures, specifications and other provisions, including changed, added or replacement Safety Standards, prior to the Final Acceptance Date, DB Team shall not be obligated to (but may) incorporate the same into its design and construction of the Project prior to the Final Acceptance Date.

7.3 Design Implementation and Submittals

7.3.1 DB Team, through the appropriately qualified and licensed design professionals identified in DB Team’s Key Personnel as identified in Exhibit 2 and in accordance with Section 2 of the Technical Provisions, shall prepare designs, Plans and specifications in accordance with the DB Documents. DB Team shall cause the Engineer of Record for the Project to sign and seal all Released for Construction Documents, any revisions to the Released for Construction
Documents, all design changes, all Shop Drawings; and for conformance, the Record Drawings (As-Builts).

7.3.2 DB Team shall deliver to GDOT accurate and complete duplicates of all Interim Design, and Preliminary and Final Plans and Construction Documents within the time and in the form required by the Technical Provisions.

7.3.3 The Engineer of Record shall initiate or sign-off on all requests for information prior to their being submitted to GDOT.

7.4 Reserved

7.5 Utility Adjustments

7.5.1 DB Team’s Responsibility

7.5.1.1 DB Team is responsible for causing, in accordance with the Project Schedule, all Utility Adjustments necessary to accommodate construction, operation, maintenance and/or use of the Project. DB Team shall coordinate, monitor, and otherwise undertake the necessary efforts to cause Utility Owners performing Utility Adjustment Work to perform such work timely, in coordination with the Work, and in compliance with the standards of design and construction and other applicable requirements specified in the DB Documents.

7.5.1.2 In addition to GDOT’s Project administration, GDOT shall independently have the right at all times to approve Utility Adjustments as provided herein. DB Team shall coordinate and be required to procure GDOT approval as required.

7.5.1.3 Regardless of the arrangements made with the Utility Owners, the DB Team shall continue to be the responsible party to GDOT for timely performance of all Utility Adjustment Work so that upon completion of the Work, all Utilities that might impact the Project or be impacted by it (whether located within or outside the Construction Maintenance Limits) are compatible with the Project. GDOT will provide to DB Team the benefit of any provisions in recorded utility or other easements affecting the Project which require the easement holders to relocate at their own expense (unless specified otherwise in the Technical Provisions or a Utility Agreement), subject, however, to any provisions of applicable Law affecting the easement holder’s obligations for Utility Adjustments.

7.5.2 Standard Utility Agreements

The DB Team will be responsible for completion of all required Standard Utility Agreements. The DB Team will work with the State Utilities Preconstruction Manager, or assigned designee, to acquire the appropriate Agreement template and coordinate the completion of all required Standard Utility Agreements with Utility Owners. Upon completion of the Standard Utility Agreement with the Utility Owner, the signed agreement should be forwarded to the District Utilities Manager for review and acceptance. Upon the acceptance by the District, the Standard Utility Agreement shall be forwarded to the State Utilities Preconstruction Manager for processing and final acceptance. As described in the
7.5.3 Requirements

Each Utility Adjustment (whether performed by DB Team, Sub-Contractor or by the Utility Owner) shall comply with the Adjustment Standards in effect as of the date of advertisement of the contract, together with any subsequent amendments and additions to those standards that (a) are necessary to conform to applicable Law, or (b) are adopted by the Utility Owner and affect the Utility Adjustment pursuant to the applicable Standard Utility Agreement(s). In addition, all Utility Adjustment Work shall comply with all applicable Laws, the applicable Standard Utility Agreement(s), and all other requirements specified in Section 6 of the Technical Provisions.

7.5.4 Failure of Utility Owners to Cooperate/Escalation

DB Team shall use diligent efforts to obtain the cooperation of each Utility Owner as necessary for Utility Adjustments. It shall be the DB Team’s responsibility to coordinate and track each utilities progress in relation to the Utility Work Plan or Revised Utility Work Plan previously accepted by GDOT. Once the DB Team has determined that the Utilities work progress is at least 20% behind the accepted Utility Work Plan; the DB Team will notify the Utility Owner, and GDOT of such apparent delay through written correspondence. Such written correspondence shall detail the delay in question and request the Utility to submit a proposal on how the Utility Owner plans to rectify such delay and maintain the project’s schedule prescribed by the previously accepted Utility Work Plan. The Utility will respond to this letter within ten (10) Business Days. The response shall include a proposal to cure the delay identified by the DB Team. In some cases, the complexity of the project may require that a utility coordination meeting be held to address the issues identified by the DB Team. If the Utility determines that this is the case, then the Utilities response letter shall include a request to hold a utility coordination meeting with the DB Team, the Office of Innovative Delivery Utility Liaison, the District Utility Manager and the Construction Manager for utility delay resolution. If the utility delay cannot be resolved through the coordination efforts described above after twenty (20) Business Days from the date provided in the DB Team’s original written correspondence; the said Dispute shall escalate to the State Construction Engineer for further consideration. If additional escalation is required, DB Team shall follow escalation procedures as outlined in the UAM, Chapter 672-19 of the Rules, and O.C.G.A. § 32-6-171.

7.5.5 Utility Permits (GUPS)

7.5.5.1 It is anticipated that during the design and construction phases of the Work, from time to time Utility Owners will apply for utility permits to install new Utilities that would cross or longitudinally occupy the Property, or to modify, upgrade, repair, relocate or expand existing Utilities within the Property for reasons other than accommodation of the Project.

7.5.5.2 As specified in Article 7.5.5.1, for all such utility permit applications pending as of or submitted after the Effective Date, DB Team shall furnish the most recent Project design information and/or as-built Plans, as applicable, to the applicants, and shall assist each applicant with information
regarding the location of other proposed and existing Utilities. DB Team shall keep records of its costs related to new Utilities separate from other Project Costs.

7.5.6 Unexpected Utility Adjustments

Within one hundred twenty (120) days after the initial NTP 2, DB Team shall conduct an investigation for any unidentified Utility. If DB Team finds an unidentified Utility during the one hundred twenty (120) day time frame, DB Team may be entitled to a Compensation Event or a Relief Event. If DB Team finds an unidentified Utility after the one hundred twenty (120) day time frame, DB Team shall not be entitled to a Compensation Event or a Relief Event. If a Utility is shown on the SUE Plans and not to be impacted by DB Team's Final Design, but is later identified by DB Team as needing to be relocated, DB Team shall not be entitled to a Compensation Event or a Relief Event. Notwithstanding the foregoing, DB Team shall not be entitled to a Compensation Event or a Relief Event for any Utility whose location, size and dimensions were reasonably accurate and shown on the SUE Plans.

7.5.7 Early Adjustments

If any Adjustments are designated as Early Adjustments in Section 6 of the Technical Provisions, such Adjustments are anticipated to be completed by the Utility Owner prior to the deadline therefore set forth in the Technical Provisions. DB Team's obligation to provide Protection in Place for Utilities includes any Early Adjustments, whether or not timely completed. DB Team shall coordinate with GDOT and the Utility Owner as may be necessary for orderly completion of any Early Adjustments, and DB Team shall conduct its Work without interfering with or hindering the progress or completion of any Early Adjustments.

7.6 Conditions to Commencement of Construction Work

7.6.1 Construction Work Generally

Except to the extent expressly permitted in writing by GDOT, DB Team shall not commence or permit or suffer commencement of construction of the Project, or applicable portion thereof, until GDOT issues NTP 3 and all of the conditions of Article 3.3.1.3 have been met.

7.6.2 Utility Adjustments

DB Team shall not commence or permit or suffer commencement of construction of a Utility Adjustment included in the Construction Work until GDOT issues NTP 3, and the requirements of Article 7.5 have been met.

7.7 Substantial Completion, Punch List, Final Acceptance; Early Opening of Portions of the Project

7.7.1 Substantial Completion

7.7.1.1 GDOT will issue a written certificate of Substantial Completion at such time as Substantial Completion occurs which shall be subject to the terms and conditions of this Article 7.7.1.
7.7.1.2 Substantial Completion shall occur upon satisfactory completion of the requirements of GDOT Standard Specification 108.07.G.

7.7.1.3 All comments from EPD on the Post-Construction Stormwater Report have been addressed by the DB Team, and the EPD’s 90-day Post-Construction Stormwater Report disapproval period has expired.

7.7.1.4 DB Team shall provide GDOT with not less than twenty (20) days prior written notification of the date DB Team determines it will achieve Substantial Completion. A written request for Substantial Completion will not be taken into consideration unless the requirements of the DB Documents have been met, and the request has been approved in writing by the Construction Quality Assurance Firm confirming Substantial Completion requirements of Article 7.7 are met. During such notice period, DB Team and GDOT shall meet and confer and exchange information on a regular cooperative basis with the goal being GDOT’s orderly, timely inspection and review of the Project and the applicable Final Plans and Construction Documents, and GDOT’s issuance of a written certificate of Substantial Completion.

7.7.1.5 During the period specified in Article 7.7.1.4, GDOT shall conduct an inspection of the Project and its components, a review of the applicable Final Plans and Construction Documents and such other investigation as may be necessary to evaluate whether Substantial Completion is achieved. GDOT shall deliver a written report of findings and recommendations to the DB Team following such inspection, review and investigation and within five (5) days after the end of the period specified in Article 7.7.1.4. GDOT shall then either (a) issue the written certificate of Substantial Completion or (b) notify DB Team in writing setting forth, as applicable, why the Project has not reached Substantial Completion. If GDOT and DB Team cannot agree that the Substantial Completion has been completed by the Substantial Completion Date defined in Exhibit 9, such Dispute shall be resolved according to Article 17.

7.7.2 Punch List

7.7.2.1 The Construction Quality Assurance Firm (CQAF) shall prepare and provide an accurate preliminary punch list to GDOT and the Owner Verification Firm (OVF) sixty (60) days prior to the Substantial Completion walk through date. The OVF will prepare and maintain the final Punch List with input from GDOT. Each participant shall have the right to add items to the Punch List and none shall remove any item added by any other without such other’s express permission. If DB Team objects to the addition of an item by GDOT, the item shall be noted as included under protest, and if the Parties thereafter are unable to reconcile the protest, the Dispute shall be resolved according to Article 17. The OVF shall deliver to GDOT and the DB Team a true and complete copy of the final Punch List, and each modification thereto, as soon as it is prepared.

7.7.2.2 DB Team shall immediately commence work on the Punch List items and diligently prosecute such work to completion, consistent with the DB Documents, prior to issuance of Final Acceptance.
7.7.3 Final Acceptance

7.7.3.1 Promptly after achieving Substantial Completion, DB Team shall perform all remaining Construction Work for the Project, including completion of all Punch List items, all landscaping other than vegetative ground cover, and aesthetic features. DB Team shall prepare and adhere to a timetable for planting and establishing the vegetative ground cover landscaping, taking into account weather conditions necessary for successful planting and growth, which timetable shall in any event provide for vegetative ground cover landscaping to be planted and established by twelve (12) months after Substantial Completion.

7.7.3.2 GDOT will issue a written certificate of Final Acceptance at such time as all of the following have occurred for the Project:

(a) All requirements for Substantial Completion have been satisfied;

(b) All Punch List items have been completed and delivered to the reasonable satisfaction of GDOT;

(c) GDOT has received a complete set of the Record Drawings in form and content required by Section 3.9 of the Technical Provisions;

(d) All Utility Adjustment Work and other work that DB Team is obligated to perform for or on behalf of third parties has been accepted by such third parties, and DB Team has paid for all work by third parties that DB Team is obligated to pay for, other than disputed amounts;

(e) DB Team has paid in full all Liquidated Damages that are due to GDOT pursuant to this Agreement and are not in Dispute, and has provided to GDOT reasonable security for the full amount of Liquidated Damages that may then be the subject of an unresolved Dispute;

(f) There exist no uncured DB Team Defaults that are the subject of a Warning Notice, or with the giving of notice or passage of time, or both, could become the subject of a Warning Notice (except any DB Team Default for which Final Acceptance will affect its cure);

(g) DB Team has received, and paid all associated fees for, all applicable Governmental Approvals and other applicable third-party approvals required pursuant to the DB Documents, and there exists no uncured material violation of the terms and conditions of any such Governmental Approval or other third-party approvals;

(h) DB Team has delivered to GDOT all warranties, manuals and other Deliverables as required pursuant to the Technical Provisions; and

(i) DB Team has delivered to GDOT verification of all required post construction period, including completed operations, Insurance Policies required under the DB Documents.
7.7.3.3 DB Team shall provide GDOT with written notification when DB Team determines it has achieved Final Acceptance. During the fifteen (15) day period following receipt of such notification, DB Team and GDOT shall meet and confer and exchange information on a regular cooperative basis with the goal being GDOT’s orderly, timely inspection and review of the Project and the Record Drawings, and GDOT’s issuance of a written certificate of Final Acceptance.

7.7.3.4 During such fifteen (15) day period, GDOT shall conduct an inspection of the Punch List items, a review of the Record Drawings and such other investigation as may be necessary to evaluate whether the conditions to Final Acceptance are satisfied. GDOT shall deliver a written report of findings and recommendations to DB Team following such inspection, review and investigation and in any case by the end of such fifteen (15) day period.

7.7.3.5 Within five (5) days after expiration of such fifteen (15) day period GDOT shall either (a) issue a certificate of Final Acceptance or (b) notify DB Team in writing setting forth, as applicable, why Final Acceptance has not been achieved. If GDOT and DB Team cannot agree as to the date of Final Acceptance, such Dispute shall be resolved according to Article 17.

7.7.4 Early Opening of Portions of the Project

The Proposer may open portions of the Work before Substantial Completion, in which case each will be identified in the Proposal Schedule and, with the same duration from NTP 1, the Project Schedule when each of those portions will be safe to open.

If the DB Team determines that a portion of the Work identified in the Project Schedule is safe to open to traffic, that portion must include the following prior to being considered safe to open: all lanes in that direction paved to final pavement surface layer, permanent striping (temporary tape may be used in lane drop tapers), temporary signing, and temporary barrier wall installed. When it determines that that portion of Work is safe to open, the DB Team may notify GDOT thereof through written notice identifying the portion of the Work and asserting that the DB Team believes that it is safe to open. Prior to notifying GDOT, the Engineer of Record shall review the condition of that portion of the Work and make a determination that it is safe to open or will produce a checklist of any remaining Work that must be completed prior to that portion of the Work being considered safe to open, with required changes to the Work identified, and submit the checklist to GDOT. Upon receipt of such list, GDOT will review the list and accept, revise, or reject the list for completeness or sufficiency of the items identified and proposed resolution. The DB Team may not open any portion of the Work unless GDOT provides written notice to the DB Team that such portion of the Work is safe to open.

The DB Team and GDOT together will inspect that portion of the Work asserted to be safe to open. GDOT will respond within five (5) days after the agreed-upon date of the inspection. If GDOT concurs, GDOT will provide written notice to the DB Team that such portion of the Segment is safe to open. If GDOT does not concur, it will provide the DB Team a list of the items that need to be corrected or completed prior to opening that portion of the Work. This process will repeat until GDOT concurs and provides written notice that that portion of the Work is safe to open and will identify the date when GDOT’s determination was made. The date so identified is the Interim Completion Date for that portion of the Work.
If the Interim Completion Date is later than the Interim Completion Deadline, as identified in Exhibit 9 to the Agreement, the DB Team is liable for Liquidated Damages per Article 17.4.1.

The DB Team remains responsible for all repair or replacement for portions of the Work released prior to Final Acceptance. Maintenance responsibilities remain with the DB Team until GDOT issues Final Acceptance. Designation of safe to open for any portion of the Project shall not start a warranty period for any portion of the Work or void or alter any terms of the Agreement.

Opening of portions of the Project prior to Substantial Completion or Final Acceptance does not constitute acceptance of the Work or a waiver of any provisions of the DB Documents.

7.8 Hazardous Materials Management

DB Team shall comply with all requirements set forth in GDOT Standard Specification 107.22 and Exhibit 11. If unexpected Hazardous Materials are encountered within South Carolina Work, the DB Team shall stop Work immediately in the affected area and notify GDOT, which will work in conjunction with SCDOT to address the matter.

7.9 Environmental Compliance

Throughout the course of the Design Work and Construction Work, DB Team’s Work shall take into account, be coordinated to allow for, and be performed in accordance with all environmental mitigation measures required under the Environmental Document approvals, including but not limited to the NEPA/GEPA Approval and any other Governmental Approvals for the Project, or under the DB Documents, and shall comply with all other conditions and requirements of the Environmental Approvals in accordance with Section 4 of the Technical Provisions, provided that the foregoing shall not require nor imply any requirement for DB Team to perform any remediation or disposal of Pre-existing Hazardous Materials or GDOT Release(s) of Hazardous Materials.

7.10 Meetings

7.10.1 DB Team shall conduct regular progress meetings with GDOT at least once a week during the course of Design Work and Construction Work. These meetings shall be attended by the DB Team’s Lead Contractor’s project manager and the Engineer of Record or Authorized Representatives of each and any other Key Personnel and other personnel as needed for productive use of the meetings.

7.10.2 In addition, GDOT and DB Team, through their respective Authorized Representatives, shall meet from time to time at the other Party’s request to discuss and resolve matters relating to the Work or the Project.

7.10.3 DB Team shall schedule all meetings with GDOT at a date, time, and place reasonably convenient to both Parties and, except in the case of urgency, shall provide GDOT with written notice and a meeting agenda at least one (1) Business Day in advance of each meeting.

7.10.4 DB Team shall be responsible to document and maintain the full subject matter of all meetings and shall distribute copies of meeting minutes to
GDOT not later than the timeframes specified in the Technical Provisions, and in the absence of any specified timeframe, within five (5) days following such meetings.

7.11 **Contractor Warranties and Correction of Non-Conforming and Defective Work**

7.11.1 DB Team shall obtain customary and reasonable warranties from all Contractors with respect to design, materials, workmanship, installations, equipment, tools, supplies, software or services, all of which DB Team shall cause to be expressly extended and assigned to GDOT, or its designee; provided that the foregoing requirement shall not apply to standard, pre-specified manufacturer warranties of mass-marketed materials, products (including software products), equipment or supplies where the warranty cannot be extended to GDOT using commercially reasonable efforts. To the extent that any Contractor warranty would be voided by reason of DB Team’s negligence in incorporating material or equipment into the Work, DB Team shall be responsible for correcting such defect.

7.11.2 Contractor warranties (if any) are in addition to all rights and remedies available under the DB Documents or applicable Law or in equity, and shall not limit DB Team’s liability or responsibility imposed by the DB Documents or applicable Law with respect to the Work, including liability for design defects, latent construction defects, strict liability, breach, negligence, willful misconduct or fraud.

7.11.3 When any act, omission, or other action of DB Team occurs that violates the requirements, conditions, or terms of the DB Documents, or affects the health, safety, or welfare of the public or natural resources, GDOT shall have the right, but not the obligation, to require and direct DB Team to take prompt action to replace, repair, or restore such damage, injury or condition within a timeframe established by GDOT, at DB Team’s sole cost and expenses and without entitlement to a Relief Event or Compensation Event.

7.12 **Maintenance During Construction Work**

7.12.1 GDOT shall be responsible for the operation and maintenance of the Existing Right of Way and any acquired right or interest in any Required Right of Way until the Construction Commencement Date. Upon NTP 3, DB Team shall assume full responsibility for maintenance of all Elements within the Construction Maintenance Limits in accordance with the Construction Maintenance Limits Plan and the requirements of the DB Documents.

7.12.2 Upon Final Acceptance, GDOT will assume responsibility for the operation and maintenance of the entire Project, provided that where GDOT has opened any portion of the Project to the public prior to Final Acceptance, GDOT shall then assume responsibility for the operations and maintenance of such portions of the Project at such earlier time, provided, however that in all cases, DB Team shall remain responsible for all Work until Final Acceptance and nothing contained herein shall otherwise limit any warranty obligations of DB Team with respect to any Defect or non-conforming Work.
7.13 For Best Value Projects Only: Impact of ATCs on the Project

7.13.1 If implementation of an ATC forming part of the Project requires the approval or consent of any Government Entity (other than GDOT) or other third party, then (a) DB Team will have full responsibility for, and bear the full risk of, obtaining any such approval or consent, and (b) if such approval or consent is not granted, or there is an unreasonable and unjustified delay in obtaining such approval or consent (subject to Article 13) (i) DB Team shall perform the Work as if such ATC had never formed part of the Project, and shall not be entitled to any additional time or compensation as a result thereof. The foregoing shall not limit DB Team’s rights under Article 14.2 (i) for Compensation Events or under Article 14.1 (s) for Relief Event on account of delays or impact costs solely related to the re-evaluation of the NEPA Approval after expiration of the GDOT Re-evaluation Period.

Article 8 SECURITY AND INCIDENT RESPONSE

8.1 Security and Incident Response

8.1.1 DB Team is responsible for the safety and security of the applicable portion of the Project that is under the control of any DB Team-Related Entity and the workers and public thereon during the performance of the Work.

8.1.2 DB Team shall comply with all rules, directives and guidance of the U.S. Department of Homeland Security and comparable State agency, and shall coordinate and cooperate with all Governmental Entities providing security, first responder and other public emergency response services, including, without limiting the foregoing, whenever the National Terrorism Advisory System (NTAS) or successor system issues an “Imminent” or “Elevated” Threat Alert or comparable level of threat or alert for any region in which the Project is located or which the Project serves. Unless directed otherwise by GDOT, DB Team, at its expense, shall assign management personnel with decision-making authority to be personally present at the relevant emergency operations center serving the region, including during a disaster affecting the Project proclaimed by the Governor of Georgia, Governor of South Carolina, the President of the United States, or their respective designees. DB Team shall provide such service twenty-four (24) hours a day, seven (7) days a week, until such level or threat or alert has expired, or until the lead agency at the operations center determines such staffing level is no longer necessary.

8.1.3 DB Team shall perform and comply with the provisions of the Technical Provisions concerning Incident Response, safety and security.

Article 9 MANAGEMENT SYSTEMS AND OVERSIGHT

9.1 Project Management

9.1.1 DB Team is responsible for all quality assurance activities necessary to manage the Work, including the Utility Adjustment Work. DB Team
shall undertake all required aspects of quality assurance for the Project and Work in accordance with the DB Documents and Good Industry Practice.

9.1.2 DB Team shall develop the necessary plans and documentation in accordance with the Proposal, this Agreement, and Section 2 and Section 3 of the Technical Provisions, and Good Industry Practice.

9.1.3 DB Team shall submit to GDOT for acceptance in its good faith discretion in accordance with the procedures described in Article 6.3 of this Agreement and the Technical Provisions each component part, plan and any proposed changes or additions to or revisions of any such component part, plan or other documentation identified in the DB Documents. Each component part, plan and other documentation of the Management Plans or any submittal identified in this Agreement, Section 3 of the Technical Provisions, including in Table 3-1, and the DB Documents, and each proposed change or addition to or revision of any such component part, plan or other documentation shall constitute a separate Submittal for purposes of Article 6.3. GDOT may propose any change required to comply with Good Industry Practice or to reflect a change in working practice to be implemented by DB Team.

9.1.4 DB Team shall not commence or permit the commencement of any aspect of the design or construction before the relevant component parts, plans and other documentation of the Management Plans applicable to such Work have been submitted to and accepted by GDOT.

9.1.5 Reserved

9.1.6 DB Team shall carry out internal audits of the Management Plans at the times prescribed in the Management Plans.

9.1.7 DB Team shall cause each of its Contractors at every level to comply with the applicable requirements of the DB Documents.

9.1.8 The DB Team shall designate a Quality Manager who shall, irrespective of their other responsibilities, have defined authority for ensuring the establishment and maintenance of the Management Plans and reporting to GDOT on the performance of the Management Plans.

9.2 Traffic Management

9.2.1 Upon GDOT issuance of NTP 3 and until Final Acceptance of the Project, DB Team shall be responsible for the general management of traffic on the applicable portion of the Project under the control of any DB Team-Related Entity. DB Team shall manage traffic to preserve and protect safety of traffic on such portions and Related Transportation Facilities and, to the maximum extent practicable, to avoid disruption, interruption or other adverse effects on traffic flow, throughput or level of service on the Related Transportation Facilities. DB Team shall conduct and carry out traffic management in accordance with all applicable Technical Provisions, Technical Documents, Laws and Governmental Approvals, and in accordance with the Transportation Management Plan, as well as any directives as may be required pursuant to Article 8.1.2.
9.2.2 DB Team shall prepare and submit to GDOT, for GDOT acceptance, a Transportation Management Plan by Project Phase for managing traffic on the Project and Related Transportation Facilities, during the period of construction (from the period from NTP 3 to Final Acceptance), addressing (a) orderly and safe movement and diversion of traffic on the Project and Related Transportation Facilities, and (b) orderly and safe diversion of traffic on the Related Transportation Facilities necessary in connection with field maintenance and repair work in response to Incidents, Emergencies and lane closures. The Transportation Management Plan shall promote safe and efficient operation of the Project and Related Transportation Facilities at all times during construction of the Project, including during Utility Adjustment Work. DB Team shall prepare the Transportation Management Plan according to the schedule set forth in Section 18 of the Technical Provisions. The Transportation Management Plan shall comply with the Technical Provisions and Technical Documents concerning traffic management and traffic operations.

9.2.3 GDOT shall have at all times, without obligation or liability to DB Team, the right to:

9.2.3.1 Issue a Directive Letter to DB Team regarding traffic management and control (with which DB Team shall comply), or directly assume traffic management and control, of the Project during any period that (a) GDOT designates the Project or portion of the Project for immediate use as an emergency evacuation route or a route to respond to a disaster proclaimed by the Governor of Georgia, Governor of South Carolina, the President of the United States, or by any other federal or State agency, or any of the aforementioned respective designees, including reversing the direction of traffic flow during such period, (b) GDOT designates the Project or a portion of the Project for immediate use as an alternate route for diversion of traffic from any interstate or Highway temporarily closed to all lanes in one or both directions due to Incident or Emergency or (c) the Commissioner determines such action will be in the public interest as a result of an emergency or natural disaster; and

9.2.3.2 Provide on the Project, via message signs or other means consistent with Good Industry Practice, non-discriminatory traveler and driver information, and other public information (e.g. AMBER alerts), provided that the means to disseminate such information does not materially interfere with the Work.

Article 10 CONTRACTING AND LABOR PRACTICES

10.1 Reserved

10.2 Responsibility for Work, Contractors and Employees

10.2.1 DB Team shall retain or cause to be retained only Contractors that are qualified, experienced and capable in the performance of the portion of the Work assigned. DB Team shall assure that each Contractor has at the time of execution of the Contract, and maintains at all times during performance of the assigned Work, all licenses required by applicable Laws. DB Team shall require
all Contractors to adhere to the requirements herein with respect to Subcontractors.

10.2.2 The retention of Contractors by DB Team will not relieve DB Team of its responsibilities hereunder or for the quality of the Work or materials or services provided by it.

10.2.3 Each Contract shall include terms and conditions sufficient to ensure compliance by all Contractors and Subcontractors, all parties performing any Work on behalf thereof, with the requirements of the DB Documents, and shall include those terms that are specifically required by the DB Documents to be included therein, including, to the extent applicable, those set forth in Exhibit 8 and any other applicable Federal Requirements.

10.2.4 Nothing in the DB Documents will create any contractual relationship between GDOT and any Subcontractor. No Contract entered into by or under DB Team shall impose any obligation or liability upon GDOT to any Subcontractor, or any of their respective employees.

10.2.5 DB Team shall supervise and be fully responsible for the actions, omissions, negligence, willful misconduct, or breach of applicable Law or contract by any Contractor or DB Team-Related Entity, or their respective members, officers, directors, partners, and employees, as though DB Team directly employed all such individuals.

10.3 Reserved

10.4 Key Personnel

10.4.1 DB Team shall retain, employ and utilize the individuals specifically listed in Exhibit 2 to fill the corresponding Key Personnel positions listed therein. DB Team shall not change or substitute any such individuals except due to retirement, death, disability, incapacity, or voluntary or involuntary termination of employment, or as otherwise accepted by GDOT pursuant to Article 10.4.2. In such circumstances, DB Team shall promptly propose a replacement with comparable experience for such position.

10.4.2 DB Team shall notify GDOT in writing of any proposed replacement for any Key Personnel position. Any proposed replacement for a Key Personnel position must be equal or better than the original Key Personnel. GDOT shall have the right to review the qualifications and character of each individual to be appointed to a Key Personnel position (including personnel employed by Contractors to fill any such position) and to accept or disapprove use of such individual in such position prior to the commencement of any Work by such individual. If DB Team fails to provide a proposed replacement that is sufficiently qualified to GDOT within thirty (30) days after notifying GDOT of a proposed replacement for any Key Personnel position, then such failure shall constitute a DB Team Default pursuant to Article 17.1.1.
10.4.3 DB Team shall cause each individual filling a Key Personnel position to dedicate the full amount of time necessary for the proper prosecution and performance of the Work.

10.4.4 DB Team shall provide to GDOT the phone numbers and email addresses for all Key Personnel. GDOT requires the ability to contact Key Personnel twenty-four (24) hours per day, seven (7) days per week.

10.5 Reserved

10.6 Labor Standards

10.6.1 In the performance of its obligations under the DB Documents, DB Team at all times shall comply, and require by contract that all Contractors and vendors comply, with all applicable federal and State labor, occupational safety and health standards, rules, regulations and federal and State orders.

10.6.2 All individuals performing the Work shall have the skill and experience and any licenses or certifications required to perform the Work assigned to them.

10.6.3 If any individual employed by DB Team or any Contractor is not performing the Work in a proper, safe and skillful manner, then DB Team shall, or shall cause such Contractor to, remove such individual and such individual shall not be re-employed on the Work. If, after notice and reasonable opportunity to cure, such individual is not removed or if DB Team fails to ensure that skilled and experienced personnel are furnished for the proper performance of the Work, then GDOT may suspend the affected portion of the Work by delivering to DB Team written notice of such suspension. Such suspension shall in no way relieve DB Team of any obligation contained in the DB Documents or entitle DB Team to any additional compensation or time extension hereunder.

10.6.4 DB Team and its Contractors shall comply with the Georgia Immigration & Compliance Act ("Immigration Act"), O.C.G.A. § 13-10-90, et seq. DB Team must certify compliance with the Immigration Act using the form attached as Exhibit 19. The required certificates and affidavits must be filed with GDOT and copies maintained by DB Team and each Contractor as of the Effective Date, recertified as of July 15 of each year, and again recertified upon final completion of the Work under the applicable Contract. State officials, including officials of the Georgia Department of Labor and GDOT, retain the right to inspect and audit the Project and employment records of DB Team and all Contractors without notice during normal working hours until the Work under the applicable Contract is complete, and as otherwise specified by Law.

10.7 Reserved

10.8 Non-Discrimination; Equal Employment Opportunity

10.8.1 DB Team shall not, and shall cause the Contractors to not, discriminate on the basis of race, color, national origin, sex, age, religion or handicap in the performance of the Work under the DB Documents. DB Team
shall carry out, and shall cause the Contractors to carry out, applicable requirements of 49 CFR Part 26. Failure by DB Team to carry out these requirements is a material breach of this Agreement, which may result in a Default Termination Event and the termination of this Agreement or such other remedy permitted hereunder as GDOT deems appropriate (subject to DB Team’s rights to notice and opportunity to cure set forth in this Agreement), but is not limited to (1) withholding monthly progress payments; (2) assessing sanctions; (3) liquidated damages; and/or (4) disqualifying the Contractor from future bidding as non-responsible.

10.8.2 DB Team shall include the immediately preceding paragraph in every Contract (including purchase orders and in every Contract of any DB Team-Related Entity for Work), and shall require that they be included in all Contracts at lower tiers, so that such provisions will be binding upon each Contractor.

10.9 Disadvantaged Business Enterprise

10.9.1 General

10.9.1.1 DB Team shall comply with 49 CFR Part 26 and GDOT’s Disadvantaged Business Enterprise (DBE) policy and program, including GDOT’s DBE Program Criteria for Acceptability attached as Exhibit 13. The purpose of GDOT’s DBE policy and program is to ensure that DBEs shall have an equal opportunity to participate in the performance of contracts financed in whole or in part with federal funds. DB Team shall comply with all applicable requirements set forth in GDOT’s DBE policy and program.

10.9.1.2 DB Team shall include provisions to effectuate GDOT’s DBE policy and program in every Contract to which it is a party (including purchase orders and task orders for Work), and shall require that they be included in all Contracts at lower tiers (including purchase orders and task orders for Work), so that such provisions will be binding upon each Contractor. The DB Team shall ensure that all contracts and subcontracts (including purchase orders and task orders for Work) with DBEs to supply labor or materials are required to be performed in accordance with 49 CFR Part 26.53.

10.9.1.3 DB Team shall maintain a dedicated DBE manager throughout the Term of the Agreement. The DBE manager must be approved by GDOT and cannot be replaced except by prior GDOT approval. The DBE manager shall meet the requirements set forth in Section 2.1.1.1 of the Technical Provisions.

10.9.2 DBE Participation Goals

10.9.2.1 The DBE Project goal is eleven percent (11%) of the overall Project cost (including design, construction, professional services, management and administration, and inspection) with respect to the race conscious participation by the DB Team. DB Team’s DBE commitments list is attached as Exhibit 14.

10.9.2.2 DB Team shall exercise good faith efforts to achieve such DBE participation goal for the Project.
10.9.2.3 DBE reporting shall meet all FHWA and GDOT’s DBE policy and program requirements except that reporting will be done quarterly throughout the Term of the Agreement. Failure to meet the participation goal or any of the commitments made in Exhibit 14 in any two (2) consecutive quarters shall require a recovery plan. The recovery plan shall be submitted within thirty (30) Days from the quarterly reporting describing why the participation goal was not achieved and why commitment(s) are not met. In addition, describe proposed actions to be taken in subsequent quarters to attain the participation goal and meet Exhibit 14 commitments. The recovery plan and proposed actions must be acceptable by GDOT and FHWA.

10.9.3 Compliance with DBE Participation Goals

10.9.3.1 DB Team shall not terminate, and shall not allow a Contractor to terminate, a DBE Subcontractor listed in its Proposal (or an approved substitute DBE firm) without GDOT’s prior written consent. This includes, but is not limited to, instances in which a Contractor seeks to perform work originally designated for a DBE Subcontractor with its own forces or those of an affiliate, a non-DBE firm, or with another DBE firm.

10.9.3.2 DB Team shall include a provision in every Contract to which it is a party stating that the Contractor shall utilize the specific DBEs listed to perform the work and supply the materials for which each is listed unless the contractor obtains GDOT’s consent as provided in 49 CFR Part 26.3(f) and that unless GDOT’s consent is provided under 49 CFR Part 26.3(f), the Contractor shall not be entitled to any payment for work or material unless it is performed or supplied by the listed DBE.

10.9.3.3 DB Team shall make available to GDOT upon request a copy of all DBE subcontracts.

10.9.3.4 Before transmitting to GDOT a request to terminate and/or substitute a DBE Subcontractor, the DB Team or Contractor must give notice in writing to the DBE Subcontractor, with a copy to GDOT, of its intent to request to terminate and/or substitute, and the reason for the request. The DB Team or Contractor must give the DBE five (5) days to respond to the notice and advise GDOT and the DB Team or Contractor of the reasons, if any, why it objects to the proposed termination of its subcontract and why GDOT should not approve the termination and/or substitution.

10.9.3.5 GDOT may only provide written consent allowing the DB Team or a Contractor to terminate a DBE firm listed in the Proposal if GDOT agrees that that the DB Team or Contractor has good cause to terminate the DBE firm. For the purposes of 49 CFR Part 26.3(f), good cause includes the following circumstances:

(a) The listed DBE Subcontractor fails or refuses to execute a written contract;

(b) The listed DBE Subcontractor fails or refuses to perform the work of its subcontract in a way consistent with normal industry standards. Provided, however, that good cause does not exist if the failure or refusal of the DBE
Subcontractor to perform its work on the subcontract results from the bad faith or discriminatory action of the DB Team or Contractor;

(c) The listed DBE Subcontractor fails or refuses to meet the DB Team’s or Contractor’s reasonable, nondiscriminatory bond requirements.

(d) The listed DBE Subcontractor becomes bankrupt, insolvent, or exhibits credit unworthiness;

(e) The listed DBE Subcontractor is ineligible to work on public works projects because of suspension and debarment proceedings pursuant 23 CFR Parts 180, 215 and 1200 or applicable state law;

(f) The listed DBE Subcontractor voluntarily withdraws from the project and provides written notice of its withdrawal;

(g) GDOT has determined that the listed DBE Subcontractor is not a responsible contractor;

(h) The listed DBE is ineligible to receive DBE credit for the type of work required;

(i) A DBE owner dies or becomes disabled with the result that the listed DBE contractor is unable to complete its work on the contract;

(j) Other documented good cause that GDOT determines compels the termination of the DBE Subcontractor. Provided, that good cause does not exist if the DB Team or Contractor seeks to terminate a DBE it relied upon to obtain the work so that the DB Team or Contractor can self-perform the work for which the DBE contractor was engaged or so that the DB Team or Contractor can substitute another DBE or non-DBE contractor after contract award.

10.9.3.6 When a DBE Subcontractor is terminated as provided above, or fails to complete its work for any reason, DB Team or Contractor is required to make good faith efforts to find another DBE Subcontractor to substitute for the original DBE. These good faith efforts shall be directed at finding another DBE to perform at least the same amount of work under the Contract as the DBE that was terminated, to the extent needed to meet the established DBE participation goal. The good faith efforts shall be documented by the DB Team or Contractor. If GDOT requests documentation of such good faith efforts, the DB Team or Contractor shall submit the documentation within seven (7) days, which may be extended for an additional seven (7) days if necessary at the request of the DB Team or Contractor, and GDOT shall provide a written determination stating whether or not good faith efforts have been demonstrated.

10.10 Job Training Program

10.10.1 DB Team, at its own cost and expense, shall include on-the-job training and shall submit to GDOT for review and acceptance a plan meeting
all requirements set forth in GDOT Standard Specification 158. There are 17,000 required training hours for this project.

10.11 Prevailing Wages

10.11.1 DB Team shall pay or cause to be paid to all applicable workers employed by it or its Contractors to perform the Work not less than the prevailing rates of wages, as provided in the statutes and regulations applicable to public work contracts, including the Davis-Bacon Act, and as provided in Exhibit 8. DB Team shall comply and cause its Contractors to comply with all Laws pertaining to prevailing wages. For the purpose of applying such Laws, the Project shall be treated as a public work paid for in whole or in part with public funds (regardless of whether public funds are actually used to pay for the Project). The foregoing shall not apply to Contracts at any tier with Governmental Entities.

10.11.2 It is DB Team’s sole responsibility to determine the wage rates required to be paid. In the event rates of wages and benefits change while this Agreement is in effect, DB Team shall bear the cost of such changes and shall have no claim against GDOT on account of such changes. Without limiting the foregoing, no claim will be allowed which is based upon DB Team’s lack of knowledge or a misunderstanding of any such requirements.

10.11.3 DB Team shall comply and cause its Contractors, other than GDOT or Governmental Entities acting as Contractors, to comply with all Laws regarding notice and posting of intent to pay prevailing wages, of prevailing wage requirements and of prevailing wage rates.

10.12 Prompt Payment to Contractors and Pay When Paid Provisions

DB Team shall comply with the Georgia Prompt Payment Act, Code Section 13-11-1 et seq. Further, neither DB Team, the Design-Build Contractor or Contractor, nor any Subcontractor shall impose retainage upon any consultant, laborer, subcontractor, vendor, materialman, or supplier with whom any of them have contracted.

10.13 Suspension and Debarment

DB Team shall deliver to GDOT, not later than January 31 of each year through Final Acceptance, and upon Final Acceptance, signed certifications regarding suspension, debarment, ineligibility, voluntary exclusion, convictions and civil judgments from DB Team, from each affiliate of DB Team (as “affiliate” is defined in 29 CFR 98.905 or successor regulation of similar import), and from each Contractor whose Contract amount equals or exceeds $100,000. The annual certification shall be substantially in the form of paragraphs 1.a through 1.d of Attachment 7 to Exhibit 8 (Federal Requirements).

10.14 DB Team Identification

Any uniforms, badges, logos and other identification worn by personnel of DB Team-Related Entities or on vehicles used to access the Project site shall bear colors, lettering, design or other features to assure clear differentiation from those of GDOT and their employees.
Article 11 RELATED AND OTHER FACILITIES

11.1 Integration with Related Transportation Facilities

11.1.1 DB Team shall locate, configure, design, and construct the termini, interchanges, entrances and exits of the Project so that the Project will be compatible and integrated with the location, configuration, design, operation and maintenance of, and provide a smooth, safe transition of traffic to and from, Related Transportation Facilities, as set forth in Section 1 and Section 11 of the Technical Provisions. The design for the Project shall include and provide for such compatibility, integration and transition. The design and construction of the Project, shall satisfy all provisions of the Technical Provisions and Management Plans relating to compatibility, integration and transition with or at Related Transportation Facilities, including those concerning signage, signaling and communications with Users.

11.1.2 Without limiting the foregoing, DB Team shall cooperate and coordinate with GDOT and any third party that owns, constructs, manages, operates or maintains a Related Transportation Facility with regard to the construction, maintenance and repair programs and schedules for such Related Transportation Facilities, in order to minimize disruption to the operation thereof.

11.1.3 To assist DB Team, GDOT shall provide to DB Team during normal working hours, reasonable access to plans, surveys, drawings, as-built drawings, specifications, reports and other documents and information in the possession of GDOT or its contractors and consultants pertaining to Related Transportation Facilities. DB Team, at its expense, shall have the right to make copies of the same. DB Team, at its expense, shall conduct such other inspections, investigations, document searches, surveys and other work as may be necessary to achieve compatibility, integration and transition with those Related Transportation Facilities identified in Section 11 of the Technical Provisions.

11.1.4 GDOT shall provide reasonable assistance to DB Team, upon its request and at its expense, in obtaining cooperation and coordination from third parties that own, manage, operate or maintain Related Transportation Facilities and in enforcing rights, remedies and warranties that DB Team may have against any such third parties. Such assistance may include GDOT’s participation in meetings and discussions. In no event shall GDOT be required to bring any legal action or proceeding against any such third party.

11.1.5 GDOT shall have at all times, without obligation or liability to DB Team, the right to conduct traffic management activities on GDOT’s Related Transportation Facilities and all other facilities of the State transportation network in the area of the Project in accordance with its standard traffic management practices and procedures in effect from time to time.
Article 12 SAFETY COMPLIANCE

12.1 Safety Compliance

12.1.1 Safety Compliance Orders

12.1.1.1 GDOT shall use good faith efforts to inform DB Team at the earliest practicable time of any circumstance or information relating to the Project which in GDOT’s reasonable judgment is likely to result in a Safety Compliance Order. Except in the case of Emergency, GDOT shall consult with DB Team prior to issuing a Safety Compliance Order concerning the risk to public or worker safety, alternative compliance measures, cost impacts, and the availability of DB Team resources to fund the Safety Compliance work.

12.1.1.2 GDOT’s duties shall include monitoring and inspecting for the purpose of determining whether any circumstances exist that warrant issuance of a Safety Compliance Order with respect to the Design Work and the Construction Work, and giving reports and recommendations to DB Team with respect thereto.

12.1.1.3 Subject to conducting such prior consultation, GDOT may issue Safety Compliance Orders to DB Team at any time from and after the Effective Date.

12.1.2 Duty to Comply

12.1.2.1 Subject to Article 12.1.1, DB Team shall implement all Safety Compliance as expeditiously as reasonably possible following issuance of the Safety Compliance Order. DB Team shall diligently prosecute the work necessary to achieve such Safety Compliance until completion, subject to any remedies allowed from the occurrence of a Relief Event.

12.1.2.2 DB Team shall perform all work required to implement Safety Compliance at DB Team’s sole cost and expense. Without limiting the foregoing and for the avoidance of doubt, in no event shall DB Team be entitled to (a) issue a Change Request, or (b) except as provided in Article 12.1.3, claim that a Compensation Event or Relief Event has occurred or resulted from the existence of a Safety Compliance Order.

12.1.3 Contesting Safety Compliance Orders

DB Team may contest a Safety Compliance Order by delivering to GDOT written notice setting forth (a) DB Team’s claim that no Safety Compliance conditions exist to justify the Safety Compliance Order, (b) DB Team’s explanation of its claim in reasonable detail and (c) DB Team’s estimate of impacts on costs and schedule attributable to the contested Safety Compliance Order. If GDOT does not receive such written notice prior to issuance of a Safety Compliance Order, or within fifteen (15) days after GDOT issues an emergency Safety Compliance Order, then DB Team thereafter shall have no right to contest. If DB Team timely contests a Safety Compliance Order, DB Team nevertheless shall implement the Safety Compliance Order, but if it is finally determined under the Dispute Resolution Procedures that Safety Compliance conditions did not exist, then the Safety Compliance Order shall be treated as a Directive Letter for a GDOT Change.
Article 13  GDOT CHANGES; DB TEAM CHANGES; DIRECTIVE LETTERS

This Article 13 sets forth the requirements for obtaining all Supplemental Agreements under this Agreement. DB Team hereby acknowledges and agrees that the Contract Sum is full and adequate compensation for performance of all of the Work, subject only to those exceptions specified in Article 14 and this Article 13.

DB Team unconditionally and irrevocably waives the right to any monetary compensation or other relief in addition to that specifically provided under the terms of this Agreement, except in accordance with Article 14 and this Article 13. The foregoing waiver encompasses all theories of liability, whether in contract, tort (including negligence), equity, quantum meruit or otherwise, and encompasses all theories to extinguish contractual obligations, including impracticability, mutual mistake, and frustration of purpose. Nothing in the Technical Provisions or Technical Documents shall have the intent or effect or shall be construed to create any right of DB Team to any Supplemental Agreement or additional monetary compensation or other relief, any provision in the Technical Provisions or Technical Documents to the contrary notwithstanding.

13.1 Directive Letters

13.1.1 GDOT may at any time issue a Directive Letter to DB Team regarding any matter for which a Supplemental Agreement can be issued or in the event of any Dispute regarding the interpretation of requirements, scope of the Work, or whether DB Team has performed in accordance with the requirements of the DB Documents. The Directive Letter will state that it is issued under this Article 13.1, will describe the Dispute or Work in question, articulate GDOT’s position, provide direction, and will state the basis for determining compensation, if any. If applicable and subject to Article 13.2.5, DB Team shall proceed immediately as directed in the letter, pending the execution of a formal Supplemental Agreement (or, if the letter states that the Work is within DB Team’s original scope of Work or is necessary to comply with the requirements of the DB Documents, DB Team shall proceed with the Work as directed but shall have the right to assert that a GDOT Change has occurred).

13.1.2 The fact that a Directive Letter was issued by GDOT shall not be considered evidence that in fact a GDOT Change occurred. The determination whether a GDOT Change in fact occurred shall be based on an analysis of the original requirements of the DB Documents and a determination as to whether the Directive Letter in fact constituted a change in those requirements.

13.1.3 In the event that a Directive Letter is issued, which results in a Force Account, the procedures of Article 14.4 will be followed.

13.2 GDOT Changes

GDOT may, at any time and without notice to any Surety, authorize, cause and/or require, pursuant to a Request for Change Proposal or Directive Letter, changes in the Work, including additions or deletions, or in terms and conditions of the Technical Provisions or Technical Documents (including changes in the standards applicable to the Work).

13.2.1 GDOT’s Request for Change Proposal
If GDOT desires to initiate a GDOT Change or to evaluate whether to initiate such a change, then GDOT may, at its discretion, issue a Request for Change Proposal. The Request for Change Proposal shall set forth the nature, extent and details of the proposed GDOT Change.

Within seven (7) days after DB Team receives a Request for Change Proposal, or such longer period to which the Parties may mutually agree, GDOT and DB Team shall consult to define the proposed scope of the change. Within seven (7) days after the initial consultation, or such longer period to which the Parties may mutually agree, GDOT and DB Team shall consult concerning the estimated financial and schedule impacts.

Within thirty (30) days following GDOT’s delivery to DB Team of the Request for Change Proposal, DB Team shall provide GDOT with a written response as to whether, in DB Team’s opinion, the proposed change constitutes a GDOT Change, will impact DB Team’s costs and/or will cause a delay to a Completion Deadline, and if so, a detailed assessment of the cost and schedule impact of the proposed GDOT Change, including the following:

DB Team’s detailed estimate of the impacts on costs of carrying out the proposed GDOT Change;

The effect of the proposed GDOT Change on the Project Schedule, including achievement of the Milestone Schedule Deadlines, taking into consideration DB Team’s duty to mitigate any delay to the extent reasonably practicable; and

Any other relevant information related to carrying out the proposed GDOT Change.

GDOT shall be entitled, but not required, to obtain, from a qualified independent consultant of GDOT’s choosing, a report prepared in accordance with Good Industry Practice as to the proposed GDOT Change related to the Design Work or the Construction Work, including recommendations and comments concerning DB Team’s estimate of the cost impacts and projected impact on the Project Schedule and Milestone Schedule Deadlines. GDOT shall pay for the work of any such consultant.

GDOT and DB Team, giving due consideration to any such report and study as may be commissioned by GDOT, shall exercise good faith efforts to negotiate a mutually acceptable Supplemental Agreement, including adjustment of the Project Schedule and Completion Deadlines, any Compensation Amount to which DB Team is entitled, and the timing and method for payment of any Compensation Amount, in accordance with Article 14.

If GDOT and DB Team are unable to reach agreement on a Supplemental Agreement, GDOT may, in its sole discretion, deliver to DB Team a Directive Letter pursuant to Article 13.1 directing DB Team to proceed with the performance of the Work in question notwithstanding such disagreement under Force Account provisions. Upon receipt of such Directive Letter, (a) DB Team shall implement and perform the Work in question as directed by GDOT and (b)
GDOT will make interim payment(s) to DB Team on a monthly basis for the costs of the Work in question subject to Article 5, to the extent they satisfy Force Account provisions.

13.2.6 GDOT shall be responsible for payment of the Compensation Amount agreed upon, or under Force Account provisions, or determined through the Dispute Resolution Procedures, through one of the payment mechanisms set forth in Articles 13.4 and 13.5 and the Project Schedule and Milestone Deadlines shall be adjusted as agreed upon or determined through the Dispute Resolution Procedures, and in accordance with this Article 13 to reflect the effects of the Supplemental Agreement.

13.3 DB Team Changes

13.3.1 DB Team’s Change Requests

13.3.1.1 DB Team may request GDOT to accept modifications to the Technical Provisions or Technical Documents by submittal of a written Change Request using a form approved by GDOT. The Change Request shall set forth DB Team’s detailed estimate of impacts on costs and schedule attributable to the requested change.

13.3.1.2 GDOT, in its sole discretion, may accept or reject any Change Request proposed by DB Team, provided that GDOT will accept a Change Request necessary to bring the Technical Provisions or Technical Documents into compliance due to an applicable Change in Law per Article 14.2(a). GDOT may condition its acceptance on new or a modification of compensation for GDOT under this Agreement in order to benefit equally in the estimated net cost savings and revenue benefit, if any, attributable to the proposed change. If GDOT accepts such change, DB Team shall execute a Supplemental Agreement and shall implement such change in accordance with the Supplemental Agreement, applicable Technical Provisions, Technical Documents, the Management Plans, Good Industry Practice, and all applicable Laws.

13.3.1.3 DB Team shall be solely responsible for payment of any increased costs and for any Project Schedule delays or other impacts resulting from a DB Team proposed Change Request. If the Change Request results in a decrease in the costs of designing, constructing or operating the Project, the savings in costs shall be allocated between DB Team and GDOT as set forth in the Supplemental Agreement.

13.3.1.4 DB Team may implement and permit a Utility Owner to implement, without a Change Request or Supplemental Agreement, changes to a Utility Adjustment design that do not vary from the Technical Provisions or Technical Documents, but such changes are subject to GDOT’s acceptance as part of a Utility Work Plan as provided in Section 6.3.2.5 of the Technical Provisions.

13.3.1.5 No Change Request shall be required to implement any change to the Work that is not specifically regulated or addressed by the DB Documents or applicable Law.
13.3.1.6 Certain minor changes without significant cost savings or revenue benefits may be accepted in writing by GDOT, and in such event, shall not require a Supplemental Agreement. Any other change in the requirements of the DB Documents shall require a Supplemental Agreement.

13.3.2 DB Team’s Notice of Compensation Event and/or Relief Event

Except as otherwise expressly provided in this Agreement, if at any time DB Team determines that a change to the work has occurred or is imminent, and that change creates a Compensation Event or Relief Event, DB Team shall submit a written notice of Compensation Event and/or Relief Event to GDOT per this Article 13 stating that a Relief Event, Compensation Event, or both has occurred or will occur. The first notice shall be labeled “Compensation/Relief Event No. 1” and subsequent notices shall be numbered sequentially.

Time is of the essence in DB Team’s delivery of its written notice of Compensation Event or written notice of a Relief Event. Accordingly, if for any reason DB Team fails to deliver a notice of Compensation Event and/or Relief Event in strict accordance with this Article 13.3.2:

(a) Within seven (7) days following the date (herein the “starting date”) on which DB Team first became aware (or should have been aware, using all reasonable due diligence) of the Relief Event, DB Team shall be deemed to have irrevocably and forever waived and released the right to relief for adverse effect attributable to the Relief Event accruing after such seven (7) day deadline and until the date DB Team submits the written notice of Compensation Event and/or Relief Event for the Relief Event; and

(b) Within ninety (90) days following the starting date, DB Team shall be deemed to have irrevocably and forever waived and released any and all right to relief (including extension of time for performance of Design Work or Construction Work) for any adverse effect attributable to such Relief Event.

13.3.2.2 Notices for Compensation Events shall include:

(a) a description of the Compensation Event and its date of occurrence in reasonable detail;

(b) the reasons why the DB Team believes additional compensation will or may be due;

(c) a detailed statement of the basis that the work is not required by the Agreement;

(d) identify particular elements of performance for which additional compensation may be sought;

(e) DB Team’s current estimate of the anticipated adverse and beneficial effects of the Compensation Event on the Project and on DB Team’s ability to perform any of its obligations under the DB Documents;
(f) a written analysis and calculation of DB Team’s current estimate of the estimated increase or decrease in costs, (including a separate breakdown of costs that impact design and those that impact construction activities) the extent applicable to the Compensation Event: and

(g) provide an estimate of the time within which a response to the notice is required to minimize cost or delay of performance.

13.3.2.3 If, following issuance of the notice of Compensation event, DB Team receives or becomes aware of any further information relating to the Compensation Event, it shall submit such further information to GDOT not later than seven (7) days of DB Team’s receipt or knowledge, as the case may be. GDOT may request from DB Team any further information that GDOT may reasonably require, and DB Team shall supply the same within a reasonable period but not later than seven (7) days after such GDOT request.

13.3.2.4 Notices of Relief Events shall include:

(a) a statement of the Relief Event upon which the delay or inability to perform is based, including its nature, the reasons why the DB Team believes additional time will or may be due, and the date of its occurrence and its actual or, if it has not concluded, its anticipated duration;

(b) the effect of the Relief Event on DB Team’s ability to perform any of its obligations under the DB Documents, including details of the relevant obligations,

(c) an impacted delay analysis meeting the requirements of Section 2.5 of the Technical Provisions regarding a Time Impact Analysis and indicating all affected activities on any Critical Path, with activity durations, predecessor and successor activities and resources; and showing Float available pursuant to Article 3.2.5, the likely duration of that effect, and identify any potential impact to the Critical Path affecting a Completion Deadline; and

(d) an explanation of the measures that DB Team proposes to undertake to mitigate the delay and other consequences of the Relief Event.

13.3.2.5 Within seven (7) days of the conclusion of an asserted Relief Event, DB Team shall update its notice of a Relief Event with the date of its actual or estimated conclusion. If, following issuance of a notice of Relief Event, but prior to its conclusion, DB Team receives or becomes aware of any further information relating to the Relief Event and/or any delay in performance or failure to perform, it shall submit such further information to GDOT not later than seven (7) days of DB Team’s receipt or knowledge of the additional information. GDOT may request from DB Team any further information that GDOT may reasonably require, and DB Team shall supply the same within a reasonable period but not later than seven (7) days after such GDOT request.

13.3.2.6 If any notice of Compensation or Relief Event concerns any hazardous condition or material described in Article 7.8, the DB Team shall be deemed to have waived the right to collect any and all costs incurred in connection
therewith to the extent that GDOT is not afforded the opportunity to inspect such material or condition before it is disturbed.

### 13.3.3 Proposed Supplemental Agreement Procedure

#### 13.3.3.1 The DB Team shall deliver a Proposed Supplemental Agreement under this Article 13.3.3 to GDOT within thirty (30) days (or longer time period if acceptable to GDOT) after delivery of the notice of Compensation and/or Relief Event in a form acceptable to GDOT. GDOT may require design and construction costs to be covered by separate Supplemental Agreements. If the DB Team requests a time extension, then GDOT, in its sole discretion, may require the DB Team to provide two alternative Proposed Supplemental Agreements, one of which shall provide for a time extension and any additional costs permitted thereunder, and the other of which shall show all acceleration costs associated with meeting an original Completion Deadline, as well as any additional costs permitted hereunder. If it is not feasible to recover to the original Completion Deadline or if the DB Team believes that the costs associated with such a recovery are prohibitive, then the DB Team shall recommend a date to be shown in the alternative Supplemental Agreement form.

#### 13.3.3.2 DB Team shall prepare a scope of work, cost estimate, Time Impact Analysis, if any, and other information as required by the DB Documents for each Proposed Supplemental Agreement. All Proposed Supplemental Agreements shall satisfy the requirements of Article 14 and shall be sufficient in detail to enable GDOT to ascertain the basis and the amount of each Proposed Supplemental Agreement. The Proposed Supplemental Agreement shall at a minimum include:

(a) A scope of work describing in detail satisfactory to the GDOT all activities associated with the asserted change event.

(b) A cost estimate that sets out the estimated costs in such a way and in sufficient detail that a fair evaluation can be made. It shall be in a form approved by GDOT and shall include as separate items: labor, materials, equipment, overhead (which includes all indirect costs) and profit, as and to the extent allowed under Articles 13 and 14. If the work is to be performed by Subcontractors and if the work is sufficiently defined to obtain Subcontractor quotes, DB Team shall obtain quotes (with breakdowns showing cost of labor, materials, equipment, overhead and profit) on the Subcontractor’s stationery and shall include such quotes as back-up for the DB Team estimate.

(c) If the DB Team claims that a Relief Event has occurred affecting the Critical Path and a Completion Deadline, it shall provide or update a prior submitted Time Impact Analysis indicating all activities represented or affected by the asserted change in accordance with this Article 13 and Section 2.5 of the Technical Provisions. The impacted delay analysis shall only modify the Activities that have been impacted by the event that justifies the extension.

(d) The DB Team shall provide such other supporting documentation as may be required by the Department.
(e) All Proposed Supplemental Agreements shall include a narrative justification detailing all causes of the asserted change, making specific reference and cite to the applicable provisions of the Agreement and DB Documents that permit a Supplemental Agreement to be issued, and describing the data and documents that establish the necessity of such asserted change.

13.3.3.3 Each lump sum and force account Proposed Supplemental Agreement shall meet all applicable requirements of Articles 13 and 14. The Proposed Supplemental Agreement submitted by DB Team will address any and all costs and delays and meet all requirements of this Article 13.3.3. GDOT shall review the Proposed Supplemental Agreement, and after negotiation and upon agreement of the terms and verification that all applicable requirements of Articles 13 and 14 are met, The DB Team and GDOT shall execute a Supplemental Agreement.

Each Proposed Supplemental Agreement shall contain a sworn certification in form acceptable to GDOT by the DB Team (and Subcontractor(s), for any Subcontractor involved in the Work or event contemplated by the Supplemental Agreement) that the Proposed Supplemental Agreement is made in good faith and in accordance with the terms of the DB Documents, the amount of time and/or compensation requested accurately reflects the appropriate adjustments and includes all known and anticipated impacts or amounts whatsoever that may be incurred as a result of the event or matter giving rise to such proposed change and that the DB Team (and Subcontractor(s), as applicable) has no reason to believe and does not believe that the factual basis for the Supplemental Agreement is falsely represented.

13.4 Final Relief Event and Compensation Event Determinations

Any final Relief Event Determination and/or final Compensation Event Determination that has been mutually accepted by GDOT and DB Team shall be set forth in a Supplemental Agreement in accordance with Article 13.3. Such Supplemental Agreement shall provide for modification of the Contract Time and the Project Schedule, including to the extent so established by such Relief Event Determination, the Milestone Schedule Deadlines, and modification of the Contract Sum pursuant to any such Compensation Event Determination, as the case may be. All Supplemental Agreements shall be all-inclusive, comprehensive, and complete, and shall not include any conditions with respect to pricing or schedule or any other matters. The DB Team is not entitled to any additional costs or time whether deriving from or related to a Supplemental Agreement.

13.5 Reserved

Article 14 RELIEF EVENTS; COMPENSATION EVENTS

14.1 Relief Events

14.1.1 A Relief Event is one or more of the following events, subject to any limitations, claims, submission requirements, and other conditions set forth in the Agreement, provided that no relief will be available to the extent that (i) the events are within DB Team's control or are due to any wrongful act, wrongful
omission, negligence, recklessness, willful misconduct, breach of contract or Law or violation of a Governmental Approval of any of the DB Team-Related Entities; or (ii) the events (or the effects of such events) could have been avoided by the exercise of reasonable caution, due diligence, or other reasonable efforts by Design-Build Team:

(a) Force Majeure Event;
(b) Latent defects in Existing Improvements;
(c) Change in Law;
(d) Discriminatory Action;
(e) GDOT’s failure to perform or observe any of the covenants or obligations of GDOT under the Agreement or other DB Documents;
(f) GDOT Change;
(g) GDOT-Caused Delay;
(h) Performance of work in the Construction Maintenance Limits or Operations and Maintenance Limits, by Separate Contractors within the ROW, carried out by or on behalf of GDOT or a Governmental Entity, excluding any Utility Adjustment Work by a Utility Owner, that directly disrupts DB Team’s onsite Work, and delays the Critical Path of the Work;
(i) Discovery at, near or on the Existing Right of Way or Property of (a) any Pre-existing Hazardous Materials or Hazardous Materials not otherwise constituting a DB Team Release of Hazardous Materials, provided that where such condition was identified in the existing Phase 1 Hazardous Materials Investigation in the RIDs, in which case DB Team shall account for same in the Project Schedule and impacts shall be limited to such conditions not identified therein (whether in type or quantity), or (b) any archeological, paleontological or cultural resources not known or which could not have reasonably been known to the DB Team prior to the Proposal Due Date;
(j) Discovery at, near or on the Existing Right of Way or Property of any Threatened or Endangered Species (regardless of whether the species is listed as threatened or endangered as of the Proposal Due Date), excluding any such presence of species known to DB Team prior to the Proposal Due Date or that would become known to DB Team by undertaking reasonable investigation prior to the Proposal Due Date;
(k) Any spill of Hazardous Material by a third party who is not acting in the capacity of a DB Team-Related Entity which (i) occurs after the Proposal Due Date, (ii) is required to be reported to a Governmental Entity and (iii) renders use of the roadway or construction area unsafe or potentially unsafe absent assessment, containment and/or remediation;
(l) Issuance of a temporary restraining order or other form of injunction by a court that prohibits prosecution of any material portion of the Work, unless the injunction is the result of an action or inaction by the Design-Build Team;

(m) Suspension, termination or interruption of an approval of Environmental Documents, except to the extent that such suspension, termination or interruption results from failure by any DB Team-Related Entity to locate or design the Project or carry out the work in accordance with the approval of Environmental Documents or other Governmental Approval (which failure may include (i) modification by or on behalf of Design-Build Team of the design concept included in the Environmental Documents approval, (ii) means or methods used by any Design-Build Team-Related Entity for carrying out the Work, or (iii) decision or action by or on behalf of Design-Build Team to use or acquire Additional Property);

(n) Any change in the design concept of the Project or any portion thereof resulting from judicial or administrative action taken with respect to a legal challenge to any approval of Environmental Documents as compared to the design concept indicated in the alternative that was the subject of the approval of Environmental Documents, except to the extent the change in design concept had already been incorporated into Design-Build Team's design schematics assumed in connection with the DB Contract Sum;

(o) Subject to clause (s) of this Article 14.1, failure to obtain, or unreasonable and unjustified delay in obtaining or otherwise maintaining once issued, a Governmental Approval from any Governmental Entity, except to the extent that such failure or delay results from failure by any Design-Build Team-Related Entity to locate or design the Project or carry out the work in accordance with the approval of Environmental Documents or other Governmental Approval (which failure may include (i) modification by or on behalf of Design-Build Team of the design concept included in the approval of Environmental Documents, (ii) means or methods used by any Design-Build Team-Related Entity for carrying out the Work, or (iii) decision or action by or on behalf of Design-Build Team to use or acquire Additional Property);

(p) GDOT’s (i) lack of good and sufficient title to any parcel in the Existing Right of Way or the Property, to the extent it interferes with or adversely affects performance of Work, (ii) inability or failure to obtain an interest (including by easement or other right of access) to real property not identified in the Proposed Right of Way and required for construction of the Project as demonstrated by Design-Build Team, exclusive of any Additional Properties, Project Specific Locations, or parcels that are solely for the convenience of Design-Build Team, to the extent it interferes with or adversely affects performance of Work, or (iii) the existence at any time following issuance of NTP 3 of any title reservation, condition, easement or encumbrance on any parcel in the Existing Right of Way or Property owned by GDOT, of record or not of record, to the extent it interferes with or adversely affects performance of Work, except any title reservations, conditions, easements or encumbrances concerning Utilities or
otherwise caused, permitted or suffered by a Design-Build Team-Related Entity;

(q) Unreasonable and unjustified delay by a Utility Owner with whom Design-Build Team has been unable to enter into a Utility Agreement in connection with a Utility Adjustment, or failure or delay of any Utility in obtaining any required easement, right of way, or other property interest as may be required, provided that all of the “conditions to assistance” described in Article 7.5.4 of the Agreement have been satisfied;

(r) Failure to obtain, or unreasonable and unjustified delay in obtaining, an approval from GDOT with respect to a Permitted Design Exception, except to the extent that such failure or delay in obtaining the GDOT approval results from failure by any Design-Build Team-Related Entity to carry out the Work in accordance with the DB Documents;

(s) Failure to obtain, or unreasonable and unjustified delay in obtaining, a Governmental Approval required for a re-evaluation of an approval of Environmental Documents due to an approved ATC; provided that Design-Build Team shall only be entitled to relief for such failure or delay after expiration of the applicable GDOT Re-evaluation Period; or

(t) Material delays as a result of any modification to the approval of Environmental Documents, as a result of the Environmental Documents, and all approved supplements and re-evaluations pertaining to the Project as of the Effective Date provided that any such modifications are not the result of an ATC, Additional Properties, or attributable to Design-Build Team’s design.

14.1.2 Extensions of Time for Relief Events

14.1.2.1 If DB Team complies with the notice and information requirements in this Article 14.1, then within sixty (60) days after receiving the Proposed Supplemental Agreement (and, if applicable, any required updates thereto) GDOT, acting reasonably, and with consideration given recommendations made by GDOT, shall issue a Relief Event Determination. GDOT shall specify in the Relief Event Determination (a) the relevant obligations for which relief is given, (b) the period of time that Milestone Schedule Deadlines or periods set forth in the Project Schedule will be extended based on the number of days of delay affecting a Critical Path, after consumption of Float available pursuant to Article 3.2.5, that is directly attributable to the Relief Event and that cannot be avoided through reasonable mitigation measures and (c) if applicable, the period of time, if any, that the Contract Time will be extended. DB Team shall be relieved from the performance of obligations to the extent specified in the Relief Event Determination.

14.1.2.2 DB Team shall not be excused from compliance with applicable Laws, Technical Provisions or Technical Documents due to the occurrence of a Relief Event, except temporary inability to comply as a direct result of a Relief Event.
14.1.2.3 If GDOT is obligated to but does not provide a Relief Event Determination within such thirty (30) day period or if DB Team disagrees with the length of the extension of the Contract Time or other relief set forth in the Relief Event Determination, DB Team shall have the right to assert a claim against GDOT for the relevant Relief Event and have such claim determined according to the Dispute Resolution Procedures. Any Dispute regarding the occurrence of a Relief Event, the terms of the Relief Event Determination or waiver of DB Team’s right to relief shall be resolved according to the Dispute Resolution Procedures.

14.1.2.4 Without limiting DB Team’s rights with respect to monetary relief for Compensation Events as set forth in this Agreement, the extensions of time as provided, if any, pursuant to this Article 14.1 are DB Team’s sole remedy for a Relief Event.

14.1.3 Limitations on Time Extensions

The DB Team shall be required to demonstrate to GDOT’s satisfaction that the change in the Work or other event or situation which is being asserted as a Relief Event will result in or has caused an identifiable and measurable delay of the Work which will impact or has impacted the Critical Path affecting a Completion Deadline.

Any extension of a Completion Deadline allowed hereunder shall exclude any delay to the extent that it did not impact the Critical Path affecting a Completion Deadline or was a concurrent delay with any other delay for which the DB Team is not entitled to an extension.

14.2 Compensation Events

A Compensation Event is any of the following events, subject to any limitations, claims submission requirements, and other conditions set forth in the Agreement, provided that no relief will be available to the extent that (i) the events are within Design-Build Team’s control, or are due to any wrongful act, wrongful omission, negligence, recklessness, willful misconduct, breach of contract or Law or violation of a Governmental Approval of any of the Design-Build Team-Related Entities; (ii) the events (or the effects of such events) could have been avoided by the exercise of reasonable caution, due diligence, or other reasonable efforts by Design-Build Team:

(a) Change in Law;
(b) Discriminatory Action;
(c) Material breach by GDOT of its material obligations under the Agreement or other DB Documents, including unreasonable failure to issue a certificate of Substantial Completion or a certificate of satisfaction of conditions precedent to Final Acceptance after Design-Build Team satisfies all applicable conditions and requirements for obtaining such certificates;
(d) GDOT-Caused Delay, other than with respect to GDOT’s failure to provide response to Design-Build Team Submittals as provided under clause (d) of the definition of a GDOT-Caused Delay;
(e) GDOT Change;
(f) A GDOT Release of Hazardous Material or remediation of Pre-Existing Hazardous Materials, but excluding the extent of any Design-Build Team Release of Hazardous Materials;

(g) Issuance by a court in a legal proceeding challenging any approval of Environmental Documents or a temporary restraining order or other form of temporary injunction that prohibits prosecution of any material portion of the Work, unless the injunction is the result of an action or inaction by the Design-Build Team;

(h) Any change in the design concept of the Project or any portion thereof resulting from judicial or administrative action taken with respect to a legal challenge to any approval of Environmental Documents as compared to the design concept indicated in the alternative that was the subject of the approval of Environmental Documents, except to the extent the change in design concept had already been incorporated into Design-Build Team’s design schematics as approved pursuant to this Agreement;

(i) Subject to clause (n) of this Article 14.2, failure to obtain, or unreasonable and unjustified delay in obtaining or otherwise maintaining once issued, a Governmental Approval from any Governmental Entity, except to the extent that such failure or delay results from failure by any Design-Build Team-Related Entity to locate or design the Project or carry out the work in accordance with the approval of Environmental Documents or other Governmental Approval (which failure may include (i) modification by or on behalf of Design-Build Team of the design concept included in the approval of Environmental Documents, (ii) means or methods used by any Design-Build Team-Related Entity for carrying out the Work, or (iii) decision or action by or on behalf of Design-Build Team to use or acquire Additional Property);

(j) GDOT’s (i) lack of good and sufficient title to any parcel in the Existing Right of Way or the State Proposed/State Acquired Right of Way or Property owned by GDOT, to the extent it interferes with or adversely affects performance of Work, (ii) inability or failure to obtain an interest (including by easement or other right of access) to real property not identified in the State Proposed/State Acquired Right of Way and required for construction of the Project as demonstrated by Design-Build Team, exclusive of any Additional Properties, Project Specific Locations, or parcels that are solely for the convenience of Design-Build Team, to the extent it interferes with or adversely affects performance of Work, or (iii) the existence at any time following issuance of NTP 3 of any title reservation, condition, easement or encumbrance on any parcel in the Existing Right of Way or Property owned by GDOT, of record or not of record, to the extent it interferes with or adversely affects performance of Work, except any title reservations, conditions, easements or encumbrances (A) concerning Utilities or (B) caused, permitted or suffered by a Design-Build Team-Related Entity;

(k) Failure to obtain, or unreasonable and unjustified delay in obtaining, an approval from GDOT with respect to a Permitted Design Exception, except to the extent that such failure or delay in obtaining the GDOT approval results from failure by any Design-Build Team-Related Entity to carry out the Work in accordance with the DB Documents;

(l) Failure to obtain, or unreasonable and unjustified delay in obtaining, a Governmental Approval required for a re-evaluation of an approval of
Environmental Documents due to an approved ATC; provided that Design-Build Team shall only be entitled to compensation for such failure or delay after expiration of the applicable GDOT Re-evaluation Period;

(m) Performance of work in the Construction Maintenance Limits or Operations and Maintenance Limits, by Separate Contractors within the ROW, carried out by or on behalf of GDOT or a Governmental Entity, excluding any Utility Adjustment Work by a Utility Owner, that directly disrupts DB Team’s onsite Work; or

(n) Material delays as a result of any modification to the approval of Environmental Documents, as a result of the Environmental Documents, and all approved supplements and re-evaluations pertaining to the Project as of the Effective Date provided that any such modifications are not the result of an ATC, Additional Properties, or attributable to Design-Build Team’s design.

14.2.1 Determining Compensable Amounts

The Compensation Amount, if any, for design or construction shall be determined by applying the following provisions.

14.2.1.1 Cost impacts shall:

(a) Exclude (i) third-party entertainment costs, lobbying and political activity costs, costs of alcoholic beverages, costs for first class travel in excess of prevailing economy travel costs, and costs of club memberships, in each case to the extent that such costs would not be reimbursed to an employee of GDOT in the regular course of business, and (ii) unallowable costs under the following provisions of the federal Contract Cost Principles, 48 CFR 31.205: 31.205-8 (contributions or donations), 31.205-13 (employee morale, health, welfare, food service, and dormitory costs and credits), 31.205-14 (entertainment costs), 31.205-15 (fines, penalties, and mischarging costs), 31.205-27 (organization costs), 31.205-34 (recruitment costs), 31.205-35 (relocation costs), 31.205-43 (trade, business, technical and professional activity costs), 31.205-44 (training and education costs), and 31.205-47 (costs related to legal and other proceedings);

(b) Exclude amounts paid or to be paid to Affiliates in excess of the pricing DB Team could reasonably obtain in an arms’ length, competitive transaction with an unaffiliated Contractor;

(c) Exclude those costs incurred in asserting, pursuing, or enforcing any Compensation Event, Relief Event or Dispute;

(d) Be reduced by any savings in costs resulting from the Compensation Event;

(e) Be subject to DB Team’s obligation to mitigate cost increases and augment cost decreases in accordance with this Article 14.2.

(f) Costs caused by the breach of contract or fault or negligence, or act or failure to act of any DB Team-Related Entity.
(g) Costs, which could reasonably, and in accordance with Good Industry Practice, have been avoided by the DB Team, including by resequencing, reallocating, or redeploying its forces to other portions of the Work (including any additional costs reasonably incurred in connection with such reallocation or redeployment) or to other activities unrelated to the Work.

(h) Costs for any rejected Work that failed to meet the requirements of the DB Documents and any necessary remedial Work.

(i) Damages or expenses barred under Section 105.13 of the latest edition of GDOT Standard Specifications: Construction of Transportation Systems.

14.2.1.2 In all cases the Compensation Amount shall be net of all insurance available to DB Team including deductibles, or deemed to be self-insured by DB Team under Article 16, with respect to cost or revenue impacts of the Compensation Event.

14.2.1.3 The Compensation Amount shall not include any amount on account of federal, State, or local income taxes. Further and notwithstanding anything to the contrary herein, the Compensation Amount shall not include, under any circumstances, costs incurred by DB Team or any Contractors on account of charges or expenses due to (a) the business organization existence or maintenance of its business of any DB Team-Related Entity or (b) labor or employment matters as a result of any Change in Law.

14.2.2 If the Compensation Event is under clause (g) of Article 14.2, then the Compensation Amount shall be limited to the incremental increase in costs of initial design and construction due to delay and disruption directly attributable to the court order.

14.2.3 DB Team shall share with GDOT all data, documents, and information pertaining to bids for any work that is the subject of a Compensation Amount, and all of the aforementioned shall be on an Open Book Basis.

14.2.4 Any Dispute between GDOT and the DB Team regarding occurrence of a Compensation Event, determination of the Compensation Amount or waiver of DB Team’s right to compensation shall be resolved according to the Dispute Resolution Procedures. The dispute resolution body(ies) shall apply the provisions of this Article 14.2 in determining the Compensation Amount.

14.2.5 Following a determination of the Compensation Amount by mutual agreement or the Dispute Resolution Procedures, GDOT shall pay such Compensation Amount (a) through periodic payments of the Compensation Amount in accordance with the scheduling and payment provisions in Section 2 of the Technical Provisions, (b) in a lump sum, payable as determined by mutual agreement or through the Dispute Resolution Procedures, or (c) in such other manner as agreed upon by the Parties. GDOT, in its sole discretion, shall be entitled to select one or any combination of the foregoing methods of compensation.
14.2.6 Without limiting DB Team’s rights with respect to non-monetary relief for Relief Events as set forth in this Agreement, the Compensation Amount shall represent the sole right to compensation and damages for the adverse financial effects of a Compensation Event. As a condition precedent to GDOT’s obligation to pay any portion of the Compensation Amount, DB Team shall execute a full, unconditional, irrevocable release, in form reasonably acceptable to GDOT, of any claims, Losses or other rights to compensation or other monetary relief associated with such Compensation Event, except for the right to the subject Compensation Amount, DB Team’s right to non-monetary relief for a Relief Event, and the right to terminate this Agreement in accordance with Article 19.4 and to receive any applicable Termination Compensation.

14.2.7 Limitations on Acceleration Costs

Acceleration costs shall be compensable hereunder only with respect to Supplemental Agreements issued by GDOT.

Acceleration costs are those fully documented increased costs reasonably incurred by the DB Team (i.e., costs over and above what the DB Team would otherwise have incurred) which are directly attributable to increasing the performance level of the Work in an attempt to complete necessary activities of the Work earlier than otherwise anticipated, such as for additional equipment, additional crews, overtime and shift premiums, increased supervision, and any unexpected movement of materials, equipment, or crews necessary for resequencing in connection with acceleration efforts. Acceleration costs do not include any costs for disruption damages as described below in Article 14.2.8.

14.2.8 No Disruption Damages

Disruption damages, whether from a single event or continual, multiple or repetitive events, are not allowed or recoverable under the Agreement. Disruption damages include costs of (i) rearranging the DB Team’s Work plan not associated with an extension of a Completion Deadline, and (ii) loss of efficiency, momentum or productivity.

14.2.9 Limitations on Delay Damages

14.2.9.1 Delay damages are compensable and are limited to the provisions of Standard Specifications 105.13.B.

14.2.9.2 Before the DB Team may obtain any increase in the Contract Sum to compensate for any delay damages or acceleration costs, the DB Team shall have demonstrated to GDOT’s satisfaction that:

(a) The Project Schedule in fact sets forth a reasonable method for completion of the Work;

(b) The change in the Work or other event or situation that is the subject of the requested Supplemental Agreement has caused or will result in an identifiable and measurable delay of the Work and impact the Critical Path affecting milestones listed in Exhibit 9;
(c) The delay damage was not due to any breach of contract or fault or negligence, or act or failure to act of any DB Team-Related Entity, and could not reasonably have been avoided by the DB Team, including by resequencing, reallocating or redeploying its forces to other portions of the Work (subject to reimbursement for additional costs reasonably incurred in connection with such reallocation or redeployment) or other activities unrelated to the Work;

(d) The delay for which compensation is sought is not concurrent with any other delay for which the DB Team is not entitled to delay damages; and

(e) The DB Team has suffered or will suffer actual costs due to such delay, each of which costs shall be justified and documented in a manner satisfactory to GDOT.

14.2.9.3 Delay damages shall only be available for delays to the Completion Deadline for Substantial Completion. For delays to any other Completion Deadline the only relief available is suspension of Liquidated Damages for the duration of the proven delay.

14.3 Lump Sum Compensation

The preferred approach by both parties is that Supplemental Agreements will be paid on a lump sum basis, if the parties can agree on a lump sum amount. Lump sum prices shall be based on the original allocations of the Contract Sum to comparable activities. If reference to price allocations is inappropriate, or when requested by GDOT or the DB Team, negotiation for lump sum Supplemental Agreements shall be on an Open Book Basis and may be based on the pricing contained in the escrowed bid documents as well as Subcontractors' bid prices.

If the parties cannot agree on a lump sum amount for Supplemental Agreements, the Supplemental Agreements will be paid as Force Account Supplemental Agreements described in Article 14.4.

14.4 Force Account Compensation

14.4.1 GDOT may at its discretion issue a Directive Letter or Force Account Supplemental Agreement whenever the Parties cannot agree to a lump sum Supplemental Agreement or GDOT determines that a Force Account Supplemental Agreement is advisable.

14.4.2 The Force Account shall instruct the DB Team to perform the Work, indicating expressly the intention to treat the items as changes in the Work, and setting forth the kind, character, and limits of the Work as far as they can be ascertained, the terms under which changes to the Contract Sum will be determined, and the estimated total change in the Contract Sum anticipated thereunder.

14.4.3 Force Account work is subject to the provisions of 109.05.B of the latest edition of GDOT Standard Specifications: Construction of Transportation Systems. No other direct or indirect compensation will be allowed, including for other miscellaneous costs for which no specific allowance is provided.
14.4.4 Upon final determination of the allowable costs, GDOT shall issue a modified Supplemental Agreement setting forth the final adjustment to the Contract Sum.

14.4.5 Force Account Records

14.4.5.1 Unless and until a lump sum Supplemental Agreement is issued, or in the case that a Directive Letter or Supplemental Agreement is issued directing work be performed under Force Account provisions, the DB Team shall maintain its records in such a manner as to provide a clear distinction between: (i) the direct cost of Work for which it is entitled (or for which it believes it is entitled) to an increase in the Contract Sum; and (ii) the costs of all other operations.

14.4.5.2 The DB Team shall contemporaneously collect, record in writing, segregate, and preserve: (a) all data necessary to determine the costs described in this Article 14.4 with respect to all Work which is the subject of a requested Supplemental Agreement, specifically including costs associated with Design Work (for which a negotiated Supplemental Agreement has not been issued); and (b) all data necessary to show the actual impact (if any) of any change on the Critical Path affecting a Completion Deadline with respect to all Work which is the subject of a Supplemental Agreement or a Proposed Supplemental Agreement, if the impact on the Critical Path affecting a Completion Deadline is in dispute.

14.4.5.3 Such data shall be provided on forms approved by GDOT. The cost of furnishing such reports is included in the DB Team’s predetermined overhead and profit.

14.4.5.4 The DB Team shall furnish daily, on forms approved by GDOT, reports of all Force Account Work. The cost of furnishing such reports shall be included in the DB Team’s overhead and profit percentages. The reports shall include:

(a) Name, classification, date, daily hours, total hours, rate, and extension for each laborer, equipment operator, and supervisor, excluding superintendents.

(b) Designation, dates, daily hours, total hours, rental rate, and extension for each unit of machinery and equipment.

(c) Quantities of materials, prices and extensions.

(d) Transportation costs of materials, machinery, and equipment.

(e) Invoices for materials used and for transportation charges.

(f) Cost of property damage, liability, and worker’s compensation insurance premiums, unemployment insurance contributions, and Social Security tax.

The reports shall also state the total costs to date for the Force Account Work.
14.4.5.5 Labor costs for Project management and administration, and construction field management above but not including the Superintendent, according to the DB Team's organization and standard work practices, are included in the markup as provided in Standard Specification 109.05.B.1.

14.4.5.6 The cost of labor for non-construction-related Work, whether provided by the DB Team or a Subcontractor, will equal the sum of the following: (i) actual wages (i.e. the base wage paid to the employee exclusive of any fringe benefits); plus (ii) an overhead based on the audited Federal Acquisition Regulations (FAR) field rates. The DB Team will also be paid for profit on non-construction labor of five (5) percent of labor costs plus overhead.

14.4.5.7 If materials used on the Force Account Supplemental Agreement Work are not specifically purchased for the Work but are taken from the DB Team's stock, the DB Team shall furnish an affidavit certifying that such materials were taken from the DB Team's stock, that the quantity claimed was actually used, and that the price and transportation costs claimed represent actual costs to the DB Team.

14.4.5.8 All Force Account Supplemental Agreement reports shall be signed by the Project Manager. GDOT will compare its records with the DB Team's reports, make the necessary adjustments, and compile the costs of Force Account Supplemental Agreement Work. When such reports are agreed upon and signed by both parties, they will become the basis of payment and may be billed in the next Payment Request, but shall not preclude subsequent adjustment based on a later audit.

Article 15 REPRESENTATIONS AND COVENANTS

15.1 DB Team Representations and Covenants

DB Team hereby represents to and covenants with GDOT as follows:

15.1.1 During all periods necessary for the performance of the Work, DB Team and its Contractor(s) will maintain all required authority, license status, professional ability, skills and capacity to perform the Work.

15.1.2 As of the Effective Date, DB Team has evaluated the constraints affecting design and construction of the Project, including the Property, the Existing Right of Way and Required Right of Way limits as well as the conditions of the Environmental Documents, and has reasonable grounds for believing and does believe that the Project can be designed and built within such constraints.

15.1.3 Except as to parcels that GDOT lacked title or access to prior to the Effective Date, DB Team, in accordance with Good Industry Practice and the requirements of the DB Documents, shall have examined the Site and surrounding locations, performed appropriate field studies and geotechnical investigations of the Site, investigated and reviewed available public and private records, and undertook other activities sufficient to familiarize itself with surface conditions and subsurface conditions, including the presence of Utilities,
Hazardous Materials, contaminated groundwater, archaeological, paleontological and cultural resources, and Threatened or Endangered Species, affecting the Site or surrounding locations; and as a result of such review, inspection, examination and other activities DB Team is familiar with and accepts the physical requirements of the Work, subject to GDOT’s obligations regarding Hazardous Materials under Article 7.8 and Exhibit 11 and DB Team's rights to seek relief under Article 14.

15.1.4 DB Team has familiarized itself with the requirements of any and all applicable Laws, including with limitation O.C.G.A. §48-13-30, et. seq., and the conditions of any required Governmental Approvals prior to entering into this Agreement. Except as specifically permitted under Article 13 or Article 14, DB Team shall be responsible for complying with the foregoing at its sole cost and without any additional compensation or time extension on account of such compliance, regardless of whether such compliance would require additional time for performance or additional labor, equipment and/or materials not expressly provided for in the DB Documents. As of the Effective Date, DB Team has no reason to believe that any Governmental Approval required to be obtained by DB Team will not be granted in due course and thereafter remain in effect so as to enable the Work to proceed in accordance with the DB Documents.

15.1.5 All Work furnished by DB Team will be performed by or under the supervision of Persons who hold all necessary, valid licenses to practice in the State, by personnel who are skilled, experienced and competent in their respective trades or professions, who are professionally qualified to perform the Work in accordance with the DB Documents and who shall assume professional responsibility for the accuracy and completeness of the Design Documents, Construction Documents and other documents prepared or checked by them.

15.1.6 As of the Effective Date, DB Team is an LLC duly organized and validly existing under the laws of Florida has the requisite power and all required licenses to carry on its present and proposed activities, and has full power, right and authority to execute and deliver the DB Documents, Principal Project Documents as and to the extent applicable, and to perform each and all of the obligations of DB Team provided for herein and therein. DB Team is duly qualified to do business, and is in good standing, in the State as of the Effective Date, and will remain duly qualified and in good standing throughout the term of this Agreement and for as long thereafter as any obligations remain outstanding under the DB Documents.

15.1.7 The execution, delivery and performance of the DB Documents, and all other Principal Project Documents to which DB Team is (or will be) a party have been (or will be) duly authorized by all necessary corporate action of DB Team; each Person executing the DB Documents and all other such Project related documents, on behalf of DB Team has been (or at the time of execution will be) duly authorized to execute and deliver each such document on behalf of DB Team; and the DB Documents, and all such other Project related documents have been (or will be) duly executed and delivered by DB Team.

15.1.8 Neither the execution and delivery by DB Team of the DB Documents and the Principal Project Documents to which DB Team is (or will be)
a party, nor the consummation of the transactions contemplated hereby or thereby, is (or at the time of execution will be) in conflict with or has resulted or will result in a default under or a violation of the governing instruments of DB Team.

15.1.9 As of the Effective Date, each of the DB Documents, the Principal Project Documents to which DB Team is (or will be) a party constitutes (or at the time of execution and delivery will constitute) the legal, valid and binding obligation of DB Team, enforceable against DB Team and, if applicable, each member of DB Team, in accordance with its terms, subject only to applicable bankruptcy, insolvency and similar laws affecting the enforceability of the rights of creditors generally and the general principles of equity.

15.1.10 As of the Effective Date, there is no action, suit, proceeding, investigation or litigation pending and served on DB Team which challenges DB Team’s authority to execute, deliver or perform, or the validity or enforceability of, the DB Documents, and all other Project related documents to which DB Team is a party, or which challenges the authority of DB Team official executing the DB Documents, or the Principal Project Documents. DB Team has disclosed to GDOT prior to the Effective Date any pending and un-served or threatened action, suit, proceeding, investigation or litigation with respect to such matters of which DB Team is aware.

15.1.11 As of the Proposal Due Date, DB Team disclosed to GDOT in writing all organizational conflicts of interest of DB Team and its Contractors of which DB Team was actually aware; and between the Proposal Due Date and the Effective Date, DB Team has not obtained knowledge of any additional organizational conflict of interest, and there have been no organizational changes to DB Team or its Contractors identified in its Proposal, which have not been accepted in writing by GDOT. For this purpose, organizational conflict of interest has the meaning set forth in Section 1.6 of the RFP (Instructions to Proposers).

15.1.12 To the extent the Design-Build Contractor is not the DB Team, DB Team represents and warrants, as of the effective date of the Design-Build Contract, as follows: (a) the Design-Build Contractor is duly organized, validly existing and in good standing under the laws of the state of its organization; (b) with respect to Persons that individually hold more than ten percent (10%) of the capital stock of the Design-Build Contractor (including options, warrants and other rights to acquire capital stock), such stock is owned by the Persons whom DB Team has set forth in a written certification delivered to GDOT prior to the Effective Date; (c) the Design-Build Contractor has the power and authority to do all acts and things and execute and deliver all other documents as are required to be done, observed or performed by it in connection with its engagement by DB Team; (d) the Design-Build Contractor has all necessary expertise, qualifications, experience, competence, skills and know-how to perform the design and construction of the Project in accordance with the DB Documents; and (e) the Design-Build Contractor is not in breach of any applicable Law that would have a material adverse effect on the design and construction of the Project.

15.1.13 The execution and delivery by DB Team of this Agreement and all other Project related documents to which DB Team is a party will not result,
at the time of execution, in a default under any other agreement or instrument to which it is a party or by which it is bound.

15.1.14 The execution and delivery by DB Team of the DB Documents and performance by DB Team of its obligations thereunder will not conflict with any Laws applicable to DB Team that are valid and in effect on the Effective Date.

15.1.15 The Design-Build Contractor shall comply in full with the provisions of Code Sections 50-24-1 through 50-24-6 of the Official Code of Georgia Annotated, relating to the “Drug-free Workplace Act”.

15.1.16 No event which, with the passage of time or the giving of notice, would constitute a DB Team Default has occurred and has not yet been cured.

15.1.17 Reserved

15.1.18 DB Team certifies, by entering into this Agreement, that neither it nor its principals are presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from entering into this Agreement by any federal agency or by any department, agency or political subdivision of the State, including GDOT. For purposes of this Article 15.1.18, the term "principal" means an officer, director, owner, partner, Key Personnel, employee, or other person with primary management or supervisory responsibilities, or a person who has a critical influence on or substantive control over the operations of DB Team.

15.1.19 DB Team represents, warrants and certifies by entering into this Agreement, that neither it nor its Affiliates is presently in arrears in payment of Taxes, permit fees or other statutory, regulatory or judicially required payments to GDOT or the State.

15.1.20 DB Team acknowledges and agrees, that as a requirement to enter into the DB Documents, the Proposal documents delivered pursuant to the RFP constitute all the information used in the preparation of the Proposal, and that no other Proposal preparation information will be considered in the resolution of Disputes. The DB Team also agrees that nothing in the Proposal documents delivered pursuant to the RFP shall change or modify the terms or conditions of the DB Documents.

15.2 GDOT Representations and Covenants

GDOT hereby represents to and covenants with DB Team as follows:

15.2.1 As of the Effective Date, GDOT has full power, right and authority to execute, deliver and perform the DB Documents and the Principal Project Documents to which GDOT is a party and to perform each and all of the obligations of GDOT provided for herein and therein.
15.2.2 As of the Effective Date, each of the DB Documents and the Principal Project Documents to which GDOT is (or will be) a party constitutes (or at the time of execution and delivery will constitute) the legal, valid and binding obligation of GDOT, enforceable against GDOT in accordance with its terms, subject only to applicable bankruptcy, insolvency and similar laws affecting the enforceability of the rights of creditors generally and the general principles of equity.

15.2.3 The execution and delivery by GDOT of this Agreement and the Principal Project Documents to which GDOT is a party will not result, at the time of execution, in a default under any other agreement or instrument to which it is a party or by which it is bound.

15.2.4 The execution and delivery by GDOT of the DB Documents and performance by GDOT of its obligations thereunder will not conflict with any Laws applicable to GDOT that are valid and in effect on the Effective Date.

15.2.5 Reserved

15.2.6 As of the Effective Date, there is no action, suit, proceeding, investigation or litigation pending and properly served on GDOT, or, to GDOT’s knowledge, without obligation to investigate, threatened, which challenges GDOT’s authority to execute, deliver or perform, or the validity or enforceability of, the DB Documents, and all other Project related documents to which GDOT is a party.

15.2.7 As of the Effective Date, there has been no amendment, variation, modification or waiver of any terms of the Joint Resolution since its adoption.

15.2.8 As of the Effective Date, there has been no amendment, variation, modification or waiver of any terms of the Intergovernmental Agreement since its execution.

15.2.9 GDOT shall promptly notify DB Team if it becomes aware of any amendment, variation, modification or waiver of any terms of the Joint Resolution or the Intergovernmental Agreement.

15.2.10 GDOT shall at all times seek to enforce its rights under the Joint Resolution and the Intergovernmental Agreement to the extent necessary to fulfill its obligations under this Agreement.

15.3 Survival of Representations and Covenants

The representations and covenants of DB Team and GDOT contained herein shall survive expiration or earlier termination of this Agreement.

15.4 Special Remedies for Mutual Breach of Representations and Covenants

Notwithstanding any other provision of this Agreement, if there exists or occurs any circumstance or event that constitutes or results in a concurrent breach of any of the representations or covenants set forth in this Article 15 by both DB Team and GDOT but does not also constitute or
result in any other breach or default by either Party, then such breaches shall not form the basis for a Compensation Event by the DB Team or damage claim by GDOT against DB Team. Instead, the only remedies shall be for the Parties to take action to rectify or mitigate the effects of such circumstance or event, to pursue severance and reformation of the DB Documents and Principal Project Documents as set forth in Article 24.13, or Termination by Court Ruling as set forth in Article 19.11 and Exhibit 20.

Article 16 INSURANCE; PERFORMANCE SECURITY; INDEMNITY

16.1 Insurance Policies and Coverage

16.1.1 Insurance Certificates and Additional Insured Endorsements Requirements

16.1.1.1 Certificates of Insurance. The DB Team shall procure the insurance coverages identified below and in Exhibit 17 at the DB Team’s expense and shall furnish GDOT an insurance certificate listing GDOT as the certificate holder and as an additional insured. Certificates of Insurance shall be on a form approved for use in the State of Georgia by the Commissioner of Insurance that provides the following:

- (a) Name and address of authorized agent
- (b) Name and address of insured
- (c) Name of insurance company(ies)
- (d) Description of policies
- (e) Policy number(s)
- (f) Policy Period(s)
- (g) Limits of liability
- (h) Name and address of GDOT as certificate holder
- (i) Project Name and Number
- (j) Signature of authorized agent
- (k) Telephone number of authorized agent
- (l) Mandatory thirty (30) Day notice of cancellation or non-renewal (except ten (10) Days for non-payment).

16.1.2 Insurer Qualifications, Insurance Requirements. Each of the insurance coverages required below (i) shall be issued by a company licensed by the Insurance Commissioner to transact the business of insurance in the State of Georgia for the applicable line of insurance, and (ii) shall be an insurer (or, for qualified self-insureds or group self-insureds, a specific excess insurer providing
statutory limits) with a Best Policyholders Rating of “A-” or better and with a financial size rating of Class V or larger. Each such policy shall contain the following provisions:

16.1.2.1 The insurance company agrees that the policy shall not be canceled, reduced, allowed to lapse or allowed to expire until thirty (30) days, except ten (10) days for non-payment of premium, after GDOT has received written notice thereof, as evidenced by return receipt of certified mail or statutory mail, or until such time as other insurance coverage providing protection equal to protection called for in this Contract shall have been received, accepted and acknowledged by GDOT. Such notice shall be valid only as to the Project as shall have been designated by Project Number and Name in said notice.

16.1.2.2 The policy shall not be subject to invalidation as to any insured by reason of any act or omission of another insured or any of its officers, employees, agents or other representatives (“Separation of Insureds”), except Professional Liability (Errors and Omissions).

16.1.2.3 Each Insurer is hereby notified that the statutory requirement that the Attorney General shall represent and defend the Indemnities remains in full force and effect and is not waived by issuance of any policy of insurance. In the event of litigation, any settlement on behalf of the indemnities must be expressly approved by the Attorney General. The DB Team and its insurance carrier may retain, but are not obligated to retain, counsel to assist with the defense of the Indemnities, in which case there will be mutual cooperation between the Attorney General and such counsel. See O.C.G.A. §45-15-12.

16.1.2.4 All deductibles shall be paid for by the DB Team.

16.1.2.5 The maximum deductible, except for Worker’s Compensation qualified self-insurers or group self-insurers, in any policy shall not exceed $250,000.00.

16.1.3 Required Insurance Coverages. The DB Team also agrees to purchase insurance and have the authorized agent state on the insurance certificate that the DB Team has purchased the following types of insurance coverages, consistent with the policies and requirements of O.C.G.A. §50-21-37. The minimum required coverages and liability limits are as follows:

16.1.3.1 Workers’ Compensation Insurance. The DB Team agrees to provide at a minimum Workers’ Compensation coverage in accordance with the statutory limits as established by the General Assembly of the State of Georgia. A group insurer must submit a certificate of authority from the Insurance Commissioner approving the group insurance plan. A self-insurer must submit a certificate from the Georgia Board of Workers’ Compensation stating the DB Team qualifies to pay its own workers’ compensation claims. The DB Team shall require all Subcontractors performing work under this Agreement to obtain an insurance certificate showing proof of Workers’ Compensation Coverage and shall submit a certificate on the letterhead of the DB Team in the following language:
This is to certify that all subcontractors performing work on this Project are covered by their own workers’ compensation insurance or are covered by the DB Team’s workers’ compensation insurance.

16.1.3.2 Employers’ Liability Insurance. The DB Team shall also maintain Employer’s Liability Insurance Coverage with limits of at least:

(a) Bodily Injury by Accident - $1,000,000 each accident; and
(b) Bodily Injury by Disease - $1,000,000 each employee.

The DB Team shall require all Subcontractors performing work under this Contract to obtain an insurance certificate showing proof of Employers Liability Insurance Coverage and shall submit a certificate on the letterhead of the DB Team in the following language:

This is to certify that all subcontractors performing work on this Project are covered by their own Employers Liability Insurance Coverage or are covered by the DB Team’s Employers Liability Insurance Coverage.

16.1.3.3 Commercial General Liability (CGL) Insurance. The DB Team shall provide Commercial General Liability Insurance (2004 ISO Occurrence Form or equivalent) that shall include, but need not be limited to, coverage for bodily injury and property damage arising from premises and operations liability, products and completed operations liability, blasting and explosion, collapse of structures, underground damage, personal injury liability and contractual liability. The CGL policy must include separate aggregate limits per Project and shall provide at a minimum the following limits:

<table>
<thead>
<tr>
<th>Coverage</th>
<th>Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Premises and Operations</td>
<td>$1,000,000.00 per Occurrence</td>
</tr>
<tr>
<td>2. Products and Completed Operations</td>
<td>$1,000,000.00 per Occurrence</td>
</tr>
<tr>
<td>3. Personal Injury</td>
<td>$1,000,000.00 per Occurrence</td>
</tr>
<tr>
<td>4. Contractual</td>
<td>$1,000,000.00 per Occurrence</td>
</tr>
<tr>
<td>5. General Aggregate</td>
<td>$2,000,000.00 per Project</td>
</tr>
</tbody>
</table>

Additional Requirements for Commercial General Liability Insurance are shown below at Article 16.1.3.6.

16.1.3.4 Commercial Business Automobile Liability Insurance. The DB Team shall provide Commercial Business Automobile Liability Insurance that shall include coverage for bodily injury and property damage arising from the operation of any owned, non-owned, or hired automobile. The Commercial Business Automobile Liability Insurance Policy shall provide not less than $1,000,000 Combined Single Limits for each occurrence. Additional Requirements for Commercial Business Automobile Liability Insurance are shown below at Article 16.1.3.6.

16.1.3.5 Commercial Umbrella Liability Insurance. The DB Team shall provide a Commercial Umbrella Liability Insurance to provide excess coverage above the Commercial General Liability, Commercial Business Automobile
Liability and the Workers’ Compensation and Employers’ Liability to satisfy the minimum limits set forth herein. The umbrella coverage shall follow form with the Umbrella limits required as follows:

<table>
<thead>
<tr>
<th>Contract Amounts Less Than $5,000,000</th>
<th>For Contract Amounts Equal to or Greater than $5,000,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>$2,000,000 per Occurrence</td>
<td>$2,000,000 per Occurrence</td>
</tr>
<tr>
<td>$4,000,000 Aggregate</td>
<td>$10,000,000 Aggregate</td>
</tr>
</tbody>
</table>

Additional Requirements for Commercial Umbrella Liability Insurance are shown below at Article 16.1.3.6.

16.1.3.6 Additional Requirements for Commercial Policies in Articles 16.1.3.3 through 16.1.3.5

(a) The DB Team shall cause its insurer to issue an Additional Insured Endorsement naming the officers, members, and employees of GDOT as additional Insureds.

(b) The policy must be on an “occurrence” basis.

16.1.3.7 Professional Liability (Errors and Omissions) Insurance. Limits shall not be less than the following:

(a) Reserved

(b) Professional Liability (Errors and Omissions): Insurance in an amount not less than five million dollars ($5,000,000.00) per claim must be maintained during the agreement term with a retroactive date no later than the date that design services commenced, and must include an extended discovery period of at least five (5) years following Substantial Completion. Such policy is to be project-specific and cover all the DB Team’s professional liabilities, whether occasioned by the DB Team, its employees, subconsultants, subcontractors or other agents arising out of design and engineering services performed under or in accordance with this Agreement.

(c) This form should be submitted to the GDOT along with the Contract at the Post Award meeting.

16.1.3.8 Maximum Deductible. The maximum deductible, except for Worker’s Compensation qualified self-insurers or group self-insurers, in any policy shall not exceed No policies shall specify a deductible of more than $250,000.

16.1.3.9 Disposition of Insurance Documents. Original certificate(s) of insurance with all endorsements attached must be deposited with GDOT evidencing the minimum insurance required.

16.1.4 Termination of Obligation to Insure. Unless otherwise expressly provided to the contrary, the obligation to insure as provided herein shall not terminate until GDOT shall have executed the certificate of Final Acceptance.
16.1.5 Failure of Insurers. The DB Team is responsible for any delay resulting from the failure of his insurance carriers to furnish proof of proper coverage in the prescribed form.

16.1.6 Inadequacy of Required Coverages - GDOT makes no representation that the scope of coverage and limits of liability specified for any Insurance Policy to be carried pursuant to this Agreement or approved variances therefrom are adequate to protect Design-Build Contractor against its undertakings under this Agreement to GDOT, or its liabilities to any third party. It is the responsibility of the DB Team and each Contractor to determine if any changes or additional coverages are required to adequately protect their interests. No such limits of liability or approved variances therefrom shall preclude GDOT from taking any actions as are available to it under the DB Documents, or otherwise at Law.

16.2 Performance and Payment Security

DB Team shall furnish Performance & Payment Bonds (“P&P Bonds”) meeting the requirements of this Article 16.2 as performance and payment security for the Work.

16.2.1 P&P Bonds

16.2.1.1 The DB Team shall furnish, or cause the furnishing of, P&P Bonds. DB Team shall obtain and deliver P&P Bonds in such amount as required pursuant to the terms set forth in the Standard Specification Section 103.05, identifying DB Team as the P&P Obligor, securing DB Team’s obligations to perform the Work and to ensure that payments owing to Claimants are made with respect to such Work.

16.2.1.2 The P&P Bonds shall be issued by a properly licensed and U.S. Treasury listed surety(ies) that have not less than “A” or better and Class VIII by A.M. Best and Company’s Insurance Reports Key Rating Guide, and listed on Treasury Department Circular 570, and be on the list of companies approved by the State for at least three (3) of the last five (5) years from the date of the proposed bond issuance. If P&P Bonds are issued by more than one surety, such P&P Bonds shall be executed on a joint and several basis.

16.3 Prosecution of Claims

16.3.1 Unless otherwise directed by GDOT in writing with respect to GDOT’s insurance claims and subject to the requirements of Articles 16.5 and 16.6 below, DB Team shall be responsible for reporting and processing all potential claims by GDOT or DB Team against the Insurance Policies required hereunder. DB Team agrees to report timely to the insurer(s) under such Insurance Policies any and all matters which may give rise to an insurance claim by DB Team or GDOT or another Indemnified Party and to promptly and diligently pursue such insurance claims in accordance with the claims procedures specified in such Insurance Policies, whether for defense or indemnity or both. DB Team shall enforce all legal rights against the insurer under the applicable Insurance Policies and applicable Laws in order to collect thereon, including pursuing necessary litigation and enforcement of judgments, provided that DB Team shall
be deemed to have satisfied this obligation if a judgment is not collectible through the exercise of lawful and diligent means.

**16.3.2** GDOT agrees to promptly notify DB Team of GDOT’s incidents, potential claims against GDOT, and matters which may give rise to an insurance claim against GDOT, to tender to the insurer GDOT’s defense of the claim under such Insurance Policies, and to cooperate with DB Team as necessary for DB Team to fulfill its duties hereunder.

**16.3.3** If in any instance DB Team has not performed its obligations respecting insurance coverage set forth in the DB Documents or is unable to enforce and collect any such insurance for failure to assert claims in accordance with the terms of the Insurance Policies or to prosecute claims diligently, then for purposes of determining DB Team’s liability and the limits thereon or determining reductions in compensation due from GDOT to DB Team on account of available insurance, DB Team shall be treated as if it has elected to self-insure up to the full amount of insurance coverage which would have been available had DB Team performed such obligations and not committed such failure. Nothing in this Article 16.3.3 or elsewhere in this Article 16.3 shall be construed to treat DB Team as electing to self-insure where DB Team is unable to collect due to the bankruptcy or insolvency of any insurer which at the time the Insurance Policy is written meets the rating qualifications set forth in this Article 16.3.

**16.3.4** DB Team shall not settle or accept any settlement of any insurance claim which is in excess of $100,000 or which involves any claim that has been asserted against GDOT, the State, or any agency or department thereof, without prior written approval of GDOT, provided that DB Team shall not be required to obtain GDOT approval for workers compensation claims.

**16.3.5** If in any instance DB Team has not promptly performed its obligation to report to applicable insurers and process any potential insurance claim tendered by GDOT or another Indemnified Party, then GDOT or the other Indemnified Party may, but is not obligated to, (a) notify DB Team in writing of GDOT’s intent to report the claim directly with the insurer and thereafter process the claim, and (b) proceed with reporting and processing the claim if GDOT or the other Indemnified Party does not receive from DB Team, within ten (10) days after so notifying DB Team, written proof that DB Team has reported the claim directly to the insurer. GDOT or the other Indemnified Party may dispense with such notice to DB Team if GDOT or the other Indemnified Party has a good faith belief that more rapid reporting is needed to preserve the claim.

**16.4 Reserved**

**16.5 Indemnity by DB Team**

**16.5.1** Subject to Article 16.5.2, DB Team shall release, protect, defend, indemnify and hold harmless the Indemnified Parties from and against any and all Third-Party Claims and Third-Party Losses arising out of, relating to or resulting from:
16.5.1.1 The breach or alleged breach of the DB Documents by DB Team;

16.5.1.2 The failure or alleged failure by any DB Team-Related Entity to comply with the Governmental Approvals, any applicable Environmental Laws or other Laws (including Laws regarding Hazardous Materials Management);

16.5.1.3 Any alleged patent or copyright infringement or other allegedly improper appropriation or use by any DB Team-Related Entity of trade secrets, patents, proprietary information, know-how, copyright rights or inventions in performance of the Work, or arising out of any use in connection with the Project of methods, processes, designs, information, or other items furnished or communicated to GDOT or another Indemnified Party pursuant to the DB Documents; provided that this indemnity shall not apply to any infringement resulting from GDOT’s failure to comply with specific written instructions regarding use provided to GDOT by DB Team;

16.5.1.4 The actual or alleged culpable act or omission, culpable error or misconduct of any DB Team-Related Entity in or associated with performance of the Work;

16.5.1.5 Any and all claims by any governmental or taxing authority claiming taxes based on gross receipts, purchases or sales, the use of any property or income of any DB Team-Related Entity with respect to any payment for the Work made to or earned by any DB Team-Related Entity;

16.5.1.6 Any and all stop notices, liens and claims filed in connection with the Work, including all expenses and attorneys’, accountants’ and expert witness fees and costs incurred in discharging any stop notice, lien or claim, and any other liability to Contractors, laborers and Suppliers for failure to pay sums due for their work, services, materials, goods, equipment or supplies, including interest and attorney’s fees, provided that GDOT is not in default in payments owing (if any) to DB Team with respect to such Work;

16.5.1.7 Any actual or threatened DB Team Release of Hazardous Materials;

16.5.1.8 The claim or assertion by any other developer or contractor that any DB Team-Related Entity interfered with or hindered the progress or completion of work being performed by the other contractor or developer, or failed to cooperate reasonably with the other developer or contractor, so as to cause inconvenience, disruption, delay or loss, except where the DB Team-Related Entity was not in any manner engaged in the management, prosecution, protection or performance of the Work;

16.5.1.9 Any dispute or claim by a Utility Owner related to any DB Team-Related Entity’s performance of, or failure to perform, the obligations under any Standard Utility Agreement;

16.5.1.10 (a) Any DB Team breach of or failure to perform an obligation that GDOT owes to a third Person, including, but not limited to, Governmental
Entities, under Law or under any agreement between GDOT and a third Person, where GDOT has delegated performance of the obligation to DB Team pursuant to the terms of the DB Documents, or (b) the negligent or willful acts or omissions of any DB Team-Related Entities which render GDOT unable to perform or abide by an obligation that GDOT owes to a third Person, including, but not limited to, Governmental Entities, under any agreement between GDOT and a third Person, where the agreement is previously disclosed or known to DB Team;

16.5.1.11 The fraud, bad faith, arbitrary or capricious acts, willful misconduct, negligence or violation of Law or contract by DB Team or Design-Build Contractor or any Affiliate of either in connection with DB Team's performance of real property acquisition services under the DB Documents;

16.5.1.12 Inverse condemnation, trespass, nuisance, interference with use and enjoyment of property or similar taking of or harm to real property by reason of (a) the failure of any DB Team-Related Entity to comply with Good Industry Practice, requirements of the DB Documents, Management Plans or Governmental Approvals, (b) the intentional misconduct or negligence of any DB Team-Related Entity, or (c) the entry onto or encroachment upon another's property by any DB Team-Related Entity;

16.5.1.13 If applicable, any violation of any federal or state securities or similar law by any DB Team-Related Entity;

16.5.1.14 Errors, inconsistencies or other defects in the design or construction of the Project and/or of Utility Adjustments, or the Work, included in the Design Work and/or Construction Work; or

16.5.1.15 Any claim asserted or alleged against GDOT in contradiction of Article 4.8.1.

16.5.2 Subject to the releases and disclaimers herein, including all the provisions set forth in Article 4.4, DB Team's indemnity obligation shall not extend to any Third-Party Claims and Third-Party Losses to the extent caused or contributed to by:

16.5.2.1 The sole negligence, recklessness or willful misconduct, bad faith or fraud of the Indemnified Party;

16.5.2.2 GDOT's breach of any of obligations under the DB Documents, subject to Article 4.3.1; or

16.5.2.3 An Indemnified Party’s violation of any Laws or Governmental Approvals;

16.5.2.4 Any material defect inherent in a prescriptive design, or construction specification included in the DB Documents that was not drafted or provided by DB Team under this Agreement, but only where prior to occurrence of the Third-Party Loss DB Team complied with such specification and did not actually know, or would not reasonably have known, while exercising reasonable diligence, that it was deficient or, if DB Team actually knew of the deficiency,
unsuccessfully sought GDOT’s waiver or acceptance of a Change Request from such specification; or

16.5.2.5 Any Compensation Event or Relief Event.

16.5.3 In claims by an employee of DB Team, a Contractor, anyone directly or indirectly employed by them or anyone for whose acts they may be liable, the indemnification obligation under this Article 16.5 shall not be limited by a limitation on the amount or type of damages, compensation or benefits payable by or for DB Team or a Contractor under workers’ compensation, disability benefit or other employee benefits laws.

16.5.4 For purposes of this Article 16.5, “Third-Party Claim” includes a claim, dispute, disagreement, cause of action, demand, suit, action, judgment, investigation, or legal or administrative proceeding which (a) is asserted, initiated or brought by any Indemnified Party’s employee, agent or contractor against an Indemnified Party, (b) is within the scope of the indemnities and (c) is not covered by the Indemnified Party’s worker’s compensation program. For purposes of this Article 16.5, “Third-Party Loss” includes any actual or alleged Loss sustained or incurred by such employee, agent or contractor.

16.6 Defense and Indemnification Procedures

16.6.1 If any of the Indemnified Parties receives notice of a claim that it believes is within the scope of the indemnities under Article 16.5, GDOT shall by writing as soon as practicable after receipt of the claim, (a) inform DB Team of the claim, (b) send to DB Team a copy of all written materials GDOT has received asserting such claim and (c) notify DB Team that should no insurer accept defense of the claim, the Indemnified Party will conduct its own defense unless DB Team accepts the tender of the claim in accordance with Article 16.6.3. As soon as practicable after DB Team receives notice of a claim or otherwise has actual knowledge of a claim, it shall tender the claim in writing to the insurers under all potentially applicable Insurance Policies and comply with all notice requirements contained in such Insurance Policies. GDOT and other Indemnified Parties also shall have the right to tender such claims to such insurers.

16.6.2 Subject to Article 16.6.4, if the insurer under any applicable Insurance Policy accepts the tender of defense, GDOT and DB Team shall cooperate in the defense as required by the Insurance Policy. If no insurer under potentially applicable Insurance Policies provides defense, then Article 16.6.3 shall apply.

16.6.3 If the defense is tendered to DB Team, then within thirty (30) days after receipt of the tender it shall notify the Indemnified Party whether it has tendered the matter to an insurer and (if not tendered to an insurer or if the insurer has rejected the tender) shall deliver a written notice stating that DB Team:

16.6.3.1 Accepts the tender of defense and confirms that the claim is subject to full indemnification hereunder without any “reservation of rights” to deny or disclaim full indemnification thereafter;
16.6.3.2 Accepts the tender of defense but with a “reservation of rights” in whole or in part, with a detailed statement as to the reasons for the “reservation of rights”; or

16.6.3.3 Rejects the tender of defense based on a determination that it is not required to indemnify against the claim under the terms of this Agreement, with a detailed statement as to the reasons for the denial.

16.6.4 If DB Team accepts the tender of defense under Article 16.6.3.1, DB Team acknowledges and agrees (and has caused the insurer to be so notified of the statutory requirements) that the Attorney General shall represent and defend the State, GDOT, and any officer, director, commissioner or employee of such Indemnified Parties; but GDOT will request that the Attorney General, without limiting the authority of the Attorney General, consider attorneys recommended by DB Team for appointment as Special Assistant Attorney General to represent and defend the referenced Indemnified Parties. DB Team may, at the option of the Attorney General, have the right to participate in the defense of the Indemnified Parties. In the event of litigation, any settlement on behalf of the Indemnified Parties must be expressly approved by the Attorney General. The foregoing shall not relieve DB Team’s obligation to bear the fees and costs of defending and settling such claim. During such defense:

16.6.4.1 DB Team shall fully and regularly inform the Indemnified Party and the Attorney General of the progress of the defense and of any settlement discussions; and

16.6.4.2 Each Indemnified Party shall fully cooperate in said defense, provide to DB Team all materials and access to personnel it requests as necessary for defense, preparation and trial and which or who are under the control of or reasonably available to the Indemnified Party, and maintain the confidentiality of all communications between it and DB Team concerning such defense.

16.6.5 If DB Team responds to the tender of defense as specified in Article 16.6.3.2 or Article 16.6.3.3, such Indemnified Parties shall also be represented by the Attorney General who shall otherwise control the defense of such claim, including settlement. The foregoing shall not relieve DB Team from its obligations to bear the fees and costs of defending and settling such claim.

16.6.6 Even if the Attorney General has appointed counsel selected by DB Team to represent any of the Indemnified Parties, the Attorney General may assume the defense of the applicable Indemnified Parties by delivering to DB Team written notice of such election and the reasons therefor, if the Indemnified Parties, at the time it gives notice of the claim or at any time thereafter, reasonably determines that:

16.6.6.1 A conflict exists between it and DB Team which prevents or potentially prevents DB Team from presenting a full and effective defense;

16.6.6.2 DB Team is otherwise not providing an effective defense in connection with the claim; or
16.6.6.3 DB Team lacks the financial capacity to satisfy potential liability or to provide an effective defense.

16.6.7 If any of the Indemnified Parties is entitled and elects to conduct its own defense pursuant hereto of a claim for which it is entitled to indemnification, DB Team shall reimburse on a current basis all reasonable costs and expenses any such Indemnified Parties incurs in investigating and defending, including, but not limited to, attorney’s fees. In the event the Indemnified Parties are entitled to and elect to conduct their own defense, then:

16.6.7.1 In the case of a defense conducted under Article 16.6.3.1, it shall have the right to settle or compromise the claim with DB Team’s prior written consent, which shall not be unreasonably withheld or delayed;

16.6.7.2 In the case of a defense conducted under Article 16.6.3.2, it shall have the right to settle or compromise the claim with DB Team’s prior written consent, which shall not be unreasonably withheld or delayed, or with approval of the court following reasonable notice to DB Team and opportunity to be heard and without prejudice to the Indemnified Party’s rights to be indemnified by DB Team; and

16.6.7.3 In the case of a defense conducted under Article 16.6.3.3, it shall have the right to settle or compromise the claim without DB Team’s prior written consent and without prejudice to its rights to be indemnified by DB Team.

16.6.8 A refusal of, or failure to accept, a tender of defense, as well as any Dispute over whether an Indemnified Party which has assumed control of defense is entitled to do so under Article 16.6.6, shall be submitted in accordance with the Dispute Resolution Procedures. DB Team shall be entitled to contest an indemnification claim and pursue, through the Dispute Resolution Procedures, recovery of defense and indemnity payments it has made to or on behalf of the Indemnified Party.

16.6.9 In determining responsibilities and obligations for defending suits pursuant to this Article 16.6, specific consideration shall be given by the Parties to the following factors: (a) the party performing the activity in question; (b) the location of the activity and incident; (c) contractual arrangements then governing the performance of the activity; and (d) allegations of respective fault contained in the claim.

16.6.10 Notwithstanding anything to the contrary set forth in Article 16.5 or this Article 16.6, the Attorney General is the only counsel authorized to represent GDOT or any State affiliated agencies or departments. In the event that there is any potential conflict of interest that could reasonably arise in the representation of any Indemnified Party and DB Team in the defense of any action, suit or proceeding pursuant to Article 16.5 above or in the event that state or local law requires the use of specific counsel, (i) such Indemnified Party may elect in its sole and absolute discretion whether to waive such conflict of interest, and (ii) unless such Indemnified Party elects to waive such conflict of interest, or in any event if required by state or local law, then the counsel designated by the Indemnified Party shall solely represent such Indemnified Party and, if applicable,
DB Team shall retain its own separate counsel, each at DB Team's sole cost and expense. The Attorney General will consider counsel recommended by DB Team for appointment as a Special Assistant Attorney General.

16.6.11 If a suit or proceeding based on a claimed infringement of a patent or copyright is brought against any of the Indemnified Parties, DB Team shall, at its own expense, defend or settle any such suit or proceeding if authorized to do so in writing by the Attorney General subject to the obligations of indemnification as set forth in Article 16.5.

16.6.12 DB Team, subject to Article 16.6, may settle the claim without the consent or agreement of the Indemnified Parties, unless the settlement (i) would result in injunctive relief or other equitable remedies or otherwise require the Indemnified Parties to comply with restrictions or limitations that adversely affect or materially impair the reputation and standing of the Indemnified Parties, (ii) would require the Indemnified Parties to pay amounts that DB Team or its insurer does not fund in full, (iii) would not result in the Indemnified Parties full and complete release from all liability to the plaintiffs or Claimants who are parties to or otherwise bound by the settlement, or (iv) directly involves any such Indemnified Parties (in which case the Attorney General shall be the only counsel authorized to represent such parties with respect to any such settlement).

Article 17 DEFAULT; REMEDIES; CLAIM FOR ADJUSTMENTS AND DISPUTES

17.1 Default by DB Team; Cure Periods

17.1.1 DB Team Default

Subject to relief from its performance obligations pursuant to Article 14.1.2.1 and Article 13.3.2.2, DB Team shall be in breach under this Agreement upon the occurrence of any one or more of the following events or conditions (each a “DB Team Default”):

17.1.1.1 DB Team (a) fails to begin the applicable Work within thirty (30) days following issuance of NTP 1; (b) fails to satisfy all conditions to issuance of NTP 3 under Article 3.3.1 by the NTP 3 Conditions Deadline; or (c) fails to satisfy all conditions to commencement of the applicable Construction Work, and fails to commence such Construction Work with diligence and continuity, as the same may be extended pursuant to this Agreement;

17.1.1.2 An Abandonment;

17.1.1.3 DB Team fails to achieve Substantial Completion by the Substantial Completion Deadline, as the same may be extended pursuant to this Agreement;

17.1.1.4 DB Team fails to achieve Final Acceptance by the Final Acceptance Deadline, or fails to achieve such required Elements of the Work by any applicable Milestone Deadline, as any such dates may be extended pursuant to this Agreement;
17.1.1.5 Any representation or covenant in the DB Documents made by DB Team, or any certificate, schedule, report, instrument or other document delivered by or on behalf of DB Team to GDOT pursuant to the DB Documents is materially false, materially misleading or materially inaccurate when made or omits material information when made;

17.1.1.6 DB Team fails to obtain, provide and maintain any insurance, bonds, or other performance security as and when required under this Agreement for the benefit of relevant parties, or fails to comply with any requirement of this Agreement pertaining to the amount, terms or coverage of the same;

17.1.1.7 DB Team makes or attempts to make or suffers a voluntary or involuntary assignment or transfer of all or any portion of this Agreement, the Project or DB Team’s Interest, or there occurs a Change of Control, in violation of Article 21;

17.1.1.8 DB Team materially fails to timely observe or perform or cause to be observed or performed any other material covenant, agreement, obligation, term or condition required to be observed or performed by DB Team under the DB Documents (including material failure to perform the Design Work, Construction Work, or any material portion thereof in accordance with the DB Documents); provided that this Article 17.1.1.8 shall not apply to DB Team Defaults specifically addressed by other provisions of Article 17.1.1;

17.1.1.9 After exhaustion of all rights of appeal, there occurs any suspension or debarment (distinguished from ineligibility due to lack of financial qualifications), or there goes into effect an agreement for voluntary exclusion, from bidding, proposing or contracting with any federal or State department or agency of (a) DB Team, (b) any member of DB Team with a material financial obligation owing to DB Team for equity or shareholder loan contributions, (c) any Affiliate of DB Team for whom transfer of ownership would constitute a Change of Control, or (d) any Key Contractor whose work is not completed;

17.1.1.10 DB Team fails to (a) deliver to GDOT any remedial plan as may be required pursuant to Article 17.3.5 or (b) otherwise fails to fully comply with the schedule or specific elements of, or actions required under, any such accepted remedial plan;

17.1.1.11 DB Team commences a voluntary case seeking liquidation, reorganization or other relief with respect to itself or its debts under any U.S. or foreign bankruptcy, insolvency or other similar Law now or hereafter in effect, seeks the appointment of a trustee, receiver, liquidator, custodian or other similar official of it or any substantial part of its assets; becomes insolvent, or generally does not pay its debts as they become due; admits in writing its inability to pay its debts; makes an assignment for the benefit of creditors; or takes any action to authorize any of the foregoing; or

17.1.1.12 An involuntary case is commenced against DB Team seeking liquidation, reorganization, dissolution, winding up, a composition or arrangement with creditors, a readjustment of debts or other relief with respect to DB Team or DB Team’s debts under any U.S. or foreign bankruptcy, insolvency or other similar
Law now or hereafter in effect; seeking the appointment of a trustee, receiver, liquidator, custodian or other similar official of DB Team or any substantial part of DB Team's assets; seeking the issuance of a writ of attachment, execution, or similar process; or seeking like relief, and such involuntary case shall not be contested by DB Team in good faith or shall remain undismmissed and unstayed for a period of sixty (60) days.

17.1.2 Forbearance and Cure Periods

For the purpose of GDOT's exercise of other remedies, subject to Article 17.2.2 and subject to remedies that this Article 17 expressly states may be exercised before lapse of a cure period, DB Team shall have the following cure periods with respect to the following DB Team Defaults:

17.1.2.1 Respecting a DB Team Default under Article 17.1.1.10, a period of five (5) days after GDOT delivers to DB Team written notice of the DB Team Default;

17.1.2.2 Respecting a DB Team Default under Article 17.1.1.6 or Article 17.1.1.7, a period of fifteen (15) days after GDOT delivers to DB Team written notice of the DB Team Default; provided that GDOT shall have the right, but not the obligation, to effect cure, at DB Team's expense, if a DB Team Default under Article 17.1.1.6 continues beyond five (5) days after such notice is delivered;

17.1.2.3 Respecting a DB Team Default under Article 17.1.1.1 or Article 17.1.1.2, a period of thirty (30) days after GDOT delivers to DB Team written notice of the DB Team Default; provided that as to a DB Team Default under Article 17.1.1.1, such cure period shall not preclude or delay GDOT's immediate exercise, without notice or demand, of its right, but not the obligation, to effect cure, at DB Team's expense;

17.1.2.4 Respecting a DB Team Default under Article 17.1.1.5, Article 17.1.1.8 or Article 17.1.1.9, a period of thirty (30) days after GDOT delivers to DB Team written notice of the DB Team Default; provided that (a) if the DB Team Default is of such a nature that the cure cannot with diligence be completed within such time period and DB Team has commenced meaningful steps to cure immediately after receiving the default notice, DB Team shall have such additional period of time, up to a maximum cure period of one hundred and eighty (180) days, as is reasonably necessary to diligently effect cure, (b) as to Article 17.1.1.5, cure will be regarded as complete when the adverse effects of the breach are cured, and (c) as to Article 17.1.1.9, if the debarred or suspended Person is a managing member, general partner or controlling investor of DB Team, cure will be regarded as complete when DB Team proves it has removed such Person from any position or ability to manage, direct or control the decisions of DB Team or to perform Work;

17.1.2.5 Respecting a DB Team Default under Article 17.1.1.11 or Article 17.1.1.12, no cure period, and there shall be no right to notice of a DB Team Default under Article 17.1.1.11 or Article 17.1.1.12; and

17.1.2.6 Respecting a DB Team Default arising from DB Team's failure to achieve any Milestone Deadline other than the Substantial Completion Deadline
or Final Acceptance Deadline, a forbearance period of thirty (30) days from the date of such DB Team Default shall apply, provided that DB Team shall, as a condition to such forbearance period, be required to (a) deliver to GDOT a remedial action plan within ten (10) days after written notice of such DB Team Default, pursuant to Article 17.3.5 (without further demand or notice by GDOT), and (b) with the delivery of such remedial action plan, acknowledge any associated Liquidated Damages that are accruing. Where such remedial action plan has been accepted by GDOT in writing, then such forbearance period as provided herein shall be extended or abbreviated as required by such remedial action plan, subject to DB Team’s diligent prosecution of the Work in accordance therewith. Any such DB Team Default shall be deemed cured upon satisfaction of the conditions set forth in such accepted remedial action plan and any Liquidated Damages shall cease to accrue upon the date of such satisfaction. Notwithstanding anything to the contrary herein, Liquidated Damages accruing during such forbearance period, as may be extended, shall not be waived by this Article 17.1.2.6 and shall be payable pursuant to the terms of this Agreement.

17.1.3 Certain Curative Actions; Status Report

17.1.3.1 If the DB Team Default consists of failure to give GDOT a required prior notice and opportunity to complete an applicable review and comment or acceptance procedure under Article 6.3 before action is taken by DB Team, such DB Team Default shall be curable only by reversing or suspending the action until the notice and review and comment or acceptance procedures are followed and completed, unless DB Team finished the action before receiving the notice of DB Team Default or unless waived by GDOT.

17.1.3.2 If the DB Team Default consists of any DB Team activity or failure to act which constitutes a change from DB Team’s activities immediately prior to the DB Team Default, such DB Team Default shall be curable only by reinstating the activity as it was being performed immediately prior to the DB Team Default.

17.1.3.3 For any DB Team Default for which a Warning Notice has been delivered by GDOT to DB Team, DB Team may request from GDOT a status report as to DB Team’s progress in effecting a cure, by delivering to GDOT a written request accompanied by DB Team’s own report as to its progress in effecting a cure. GDOT shall provide its response within ten (10) Business Days after receipt of DB Team’s written request and report. The response shall be provided solely for purposes of informing DB Team as to GDOT’s view of the progress in effecting a cure for the DB Team Default, shall not constitute an admission of any fact, shall not be admissible in evidence for any purpose, shall not form the basis for any Dispute, and shall not limit in any way GDOT’s right to terminate this Agreement in accordance with Article 19.3 should cure not be effected within the relevant period.

17.2 Warning Notices

17.2.1 Warning Notice Events
Without prejudice to any other right or remedy available to GDOT, GDOT may, but in no case shall be required to, deliver a written notice (a “Warning Notice”) to DB Team, stating explicitly that it is a “Warning Notice” and stating in reasonable detail the matter or matters giving rise to the notice and, if applicable, amounts due from DB Team, and reminding DB Team of the implications of such notice, whenever there occurs any of the following:

17.2.1 Any DB Team Default under Article 17.1.1.1, 17.1.1.2, 17.1.1.7, 17.1.1.8, or 17.1.1.10;

17.2.2 Delay or failure to achieve any Milestone Deadline; or

17.2.3 Any other material DB Team Default.

17.2.2 Effect of Warning Notice on DB Team Cure Period

17.2.2.1 Any notice of a DB Team Default issued under Article 17.1 may, if it concerns a matter under Article 17.2.1, also be issued as a Warning Notice. In such case, the cure period available to DB Team, if any, shall be as set forth in Article 17.1.2.

17.2.2.2 If GDOT issues a Warning Notice under Article 17.2.1 for any DB Team Default after it issues a notice of such DB Team Default, then the cure period available to DB Team, if any, for such DB Team Default before GDOT may seek to appoint a receiver for DB Team, remove DB Team or terminate this Agreement on account of such DB Team Default shall be extended by the time period between the date the notice of such DB Team Default was issued and the date the Warning Notice is issued. No later issuance of a Warning Notice shall extend the time when GDOT may exercise any other remedy respecting such DB Team Default.

17.2.3 Other Effects of Warning Notice

17.2.3.1 The issuance of a Warning Notice shall entitle GDOT to increase the level of oversight as provided in Article 17.3.8.

17.2.3.2 The issuance of a Warning Notice may trigger a Default Termination Event as provided in Article 19.3.

17.3 Remedies for DB Team Default

17.3.1 Termination

In the event of any DB Team Default that is or becomes a Default Termination Event set forth in Article 19.3.1, GDOT may terminate this Agreement and GDOT thereupon may take control of the Work, which termination shall, among other things, automatically terminate all of DB Team's rights under Article 2, whereupon DB Team shall take all action required to be taken by DB Team under Article 19.5.

17.3.2 Remedies for Failure to Meet Safety Standards or Perform Safety Compliance
17.3.2.1 Subject to Article 17.3.2.4, if at any time DB Team fails to meet any Safety Standard or timely perform Safety Compliance or GDOT and DB Team cannot reach an agreement regarding the interpretation or application of a Safety Standard or the valid issuance of a Safety Compliance Order within a period of time acceptable to GDOT, acting reasonably, GDOT shall have the absolute right and entitlement to undertake or direct DB Team to undertake any work required to ensure implementation of and compliance with Safety Standards as interpreted or applied by GDOT or with the Safety Compliance Order.

17.3.2.2 To the extent that any work done pursuant to Article 17.3.2.1 is undertaken by GDOT and is reasonably necessary to comply with Safety Standards or perform validly issued Safety Compliance Orders, DB Team shall pay to GDOT on demand GDOT Recoverable Costs in connection with such work, and GDOT (whether it undertakes the work or has directed DB Team to undertake the work) shall have no obligation or liability to compensate DB Team for any Losses DB Team suffers or incurs as a result thereof.

17.3.2.3 To the extent that any work done pursuant to Article 17.3.2.1 is undertaken by GDOT and is not reasonably necessary to comply with Safety Standards or perform validly issued Safety Compliance Orders, GDOT shall compensate DB Team only for Losses DB Team suffers or incurs as a direct result thereof.

17.3.2.4 To the extent that any Safety Compliance Order work pursuant to Article 17.3.2.1 is undertaken by DB Team under written protest delivered prior to starting the work and it is finally determined that the Safety Compliance work was not necessary, the unnecessary work under the Safety Compliance Order shall be treated as a GDOT Change.

17.3.2.5 Notwithstanding anything to the contrary contained in the DB Documents, if in the good faith judgment of GDOT, DB Team has failed to meet any Safety Standards or perform Safety Compliance and the failure results in an Emergency or danger to persons or property, and if DB Team is not then diligently taking all necessary steps to rectify or deal with such Emergency or danger, GDOT may, without notice and without awaiting lapse of the period to cure any breach, and in addition and without prejudice to its other remedies, (but is not obligated to) (a) immediately take such action as may be reasonably necessary to rectify the Emergency or danger, in which event DB Team shall pay to GDOT on demand the cost of such action, including GDOT Recoverable Costs, or (b) suspend Construction Work and/or close or cause to be closed any and all portions of the Project affected by the Emergency or danger. So long as GDOT undertakes such action in good faith, even if under a mistaken belief in the occurrence of such failure or existence of an Emergency or danger as a result thereof, such action shall not be deemed unlawful or a breach of this Agreement, shall not expose GDOT to any liability to DB Team and shall not entitle DB Team to any other remedy, it being acknowledged that GDOT has a high priority, paramount public interest in protecting public and worker safety at the Project and adjacent and connecting areas. GDOT’s good faith determination of the existence of such a failure, Emergency or danger shall be deemed conclusive in the absence of clear and convincing evidence to the contrary. Immediately following rectification of such Emergency or danger, as determined by GDOT, acting reasonably, GDOT shall
allow the Construction Work to continue or such portions of the Project to reopen, as the case may be. The foregoing shall not, however, protect GDOT from DB Team's lawful claims to indemnity or contribution for third-party bodily injury or property damage arising out of any such GDOT action, if and to the extent (i) GDOT was mistaken in believing such a DB Team Default occurred, (ii) the third-party liability is not insured and not required to be insured under the DB Documents, and (iii) such injury or property damage was caused by GDOT's negligence, recklessness or intentional misconduct.

17.3.3 Step-in Rights

Upon the occurrence of a DB Team Default and expiration, without full and complete cure, of the cure period, if any, available to DB Team, without necessity for a Warning Notice, and without waiving or releasing DB Team from any obligations, GDOT shall have the right, but not the obligation, for so long as such DB Team Default remains uncurable by GDOT or DB Team, to pay and perform all or any portion of DB Team's obligations and the Work that are the subject of such DB Team Defaults, as well as any other then-existing breaches or failures to perform for which DB Team received prior written notice from GDOT but has not commenced diligent efforts to cure provided, that (i) except with respect to DB Team's lawful claims for third-party bodily injury or property damage arising out of such GDOT action, GDOT will not incur any liability to DB Team for any act or omission of GDOT or any other Person in the course of remedying or attempting to remedy any DB Team Default and (ii) GDOT's cure of any DB Team Default will not waive or affect GDOT's rights against DB Team by reason of the DB Team Default.

17.3.3.1 In connection with such action, GDOT may, to the extent and only to the extent reasonably required for or incident to curing the DB Team Default or such other breaches or failures to perform for which DB Team received prior written notice from GDOT but has not commenced and continued diligent efforts to cure:

(a) Employ security guards and other safeguards to protect the Project;

(b) Spend such sums as are reasonably necessary to employ and pay such architects, engineers, consultants and contractors and obtain materials and equipment as may be required, without obligation or liability to DB Team or any Contractors for loss of opportunity to perform the same Work or supply the same materials and equipment;

(c) Draw on and use proceeds from payment and performance bonds and other performance security to the extent available under the terms thereof to pay such sums;

(d) Execute all applications, certificates and other documents as may be required;

(e) Make decisions respecting, assume control over and continue Work as may be reasonably required;

(f) Meet with, coordinate with, direct and instruct contractors and suppliers, process invoices and applications for payment from contractors and
suppliers, pay contractors and suppliers, and resolve claims of contractors, subcontractors and suppliers, and for this purpose DB Team irrevocably appoints GDOT as its attorney-in-fact with full power and authority to act for and bind DB Team in its place and stead;

(g) Take any and all other actions as may be reasonably required or incident to curing; and

(h) Prosecute and defend any action or proceeding incident to the Work undertaken.

17.3.3.2 DB Team shall reimburse GDOT on demand, GDOT Recoverable Costs in connection with the performance of any act or Work authorized by this Article 17.3.3.

17.3.3.3 GDOT and any of their Authorized Representatives, contractors, subcontractors, vendor and employees shall not be liable to DB Team in any manner for any inconvenience or disturbance arising out of its entry onto the Project or Project Specific Locations in order to perform under this Article 17.3.3, unless caused by the gross negligence, recklessness, willful misconduct or bad faith of such Person. If any Person exercises any right to pay or perform under this Article 17.3.3, it nevertheless shall have no liability to DB Team for the sufficiency or adequacy of any such payment or performance, or for the manner or quality of design, or construction unless caused by the gross negligence, recklessness, willful misconduct or bad faith of such Person.

17.3.3.4 The rights under this Article 17.3.3 are subject to the right of any Surety under payment and performance bonds to assume performance and completion of all bonded work.

17.3.3.5 In the event GDOT takes action described in this Article 17.3.3 and it is later finally determined that GDOT lacked the right to do so because there did not occur a DB Team Default and expiration, without full and complete cure, of the cure period, if any, available to DB Team, then GDOT's action shall be treated as a Directive Letter for a GDOT Change.

17.3.4 Damages; Offset

17.3.4.1 Subject to Article 17.3.10 and Article 17.3.11 and the provisions on Liquidated Damages set forth in Article 17.4, GDOT shall be entitled to recover any and all damages available at Law (subject to the duty at Law to mitigate damages and without duplicate recovery) on account of the occurrence of a DB Team Default, including, to the extent available at Law, (a) loss of any compensation due GDOT under the DB Documents proximately caused by the DB Team Default, (b) actual and projected costs to remedy any defective part of the Work, (c) actual and projected costs to rectify any breach or failure to perform by DB Team and/or to bring the condition of the Project to the standard it would have been in if DB Team had complied with its obligations to carry out and complete the Work in accordance with the DB Documents, (d) actual and projected costs to GDOT to terminate, take over the Project, re-procure and replace DB Team, and (e) actual and projected increases in costs to GDOT to complete the Project if not
completed, together with interest thereon at the Default Interest Rate commencing from the date any amount becomes due to GDOT until paid. DB Team shall owe any such damages that accrue after the occurrence of the DB Team Default and the delivery of notice thereof, if any, required by this Agreement regardless of whether the DB Team Default is subsequently cured.

17.3.4.2 GDOT may deduct and offset any claim amount owing to it, provided such claim amount has been liquidated through Dispute Resolution Procedures or otherwise, from and against any amounts GDOT may owe to DB Team or any Affiliate pursuant to this Agreement; provided that GDOT shall first draw on all amounts held in respect of the claim in the GDOT Claims Account.

17.3.4.3 If the claim amount is not liquidated, GDOT may elect to exercise its right to direct a payment from DB Team up to the disputed portion of the claim which payment shall be deposited into the GDOT Claims Account. Upon liquidation, the disputed portion of the claim shall be satisfied first from the amounts held in the GDOT Claims Account, and then through GDOT’s right of offset with respect to the liquidated claim amounts.

17.3.5 Remedial Action Plan Delivery and Implementation

17.3.5.1 Upon the occurrence of a DB Team Default, GDOT shall have the right, but is not obligated, to demand that DB Team shall, within ten (10) days after written notice of such DB Team Default, be required to prepare and submit a remedial action plan for GDOT approval.

17.3.5.2 The remedial action plan shall set forth a schedule and specific actions to be taken by DB Team to improve its performance and cure the DB Team Default. Such actions may include improvements to DB Team’s quality management practices, plans and procedures, revising and restating components of the Management Plans, changes in organizational and management structure, increased monitoring and inspections, changes in Key Personnel and other important personnel, replacement of Contractors, corrective measures necessary to expedite the progress of construction and to demonstrate ability to achieve any Milestone Deadline including, without limitation, (i) working additional shifts or overtime and/or (ii) supplying additional manpower, equipment and facilities, and delivery of security to GDOT.

17.3.5.3 DB Team’s failure to diligently prosecute the Work in accordance with any such approved remedial action plan shall be deemed a further DB Team Default.

17.3.6 Performance Security

17.3.6.1 Upon the occurrence of a DB Team Default and expiration, without full and complete cure, of the applicable cure period, if any, under Article 17.1.2, without necessity for a Warning Notice, and without waiving or releasing DB Team from any obligations, and subject to Article 16 as applicable, GDOT shall be entitled to make demand upon and enforce any bond, and make demand upon, draw on and enforce and collect any guaranty or other payment or performance security available to GDOT under this Agreement with respect to the
DB Team Default in question in any order in GDOT’s sole discretion. Where access to a bond or other payment or performance security is to satisfy damages owing, GDOT shall be entitled to make demand, draw, enforce and collect regardless of whether the DB Team Default is cured subsequent to such draw. GDOT will apply the proceeds of any such action to the satisfaction of DB Team’s obligations under the DB Documents, including payment of amounts due GDOT. The foregoing does not limit or affect any other right of GDOT to make demand upon and enforce any bond, and make demand upon, draw on and enforce and collect any guaranty or other payment or performance security, immediately after GDOT are entitled to do so under the bond, guaranty or other payment or performance security.

17.3.7 Suspension of Work

17.3.7.1 Upon GDOT’s delivery of notice of DB Team Default for any of the following breaches or failures to perform and DB Team’s failure to fully cure and correct, within the applicable cure period, if any, available to DB Team under Article 17.1.2, GDOT shall have the right and authority to suspend any affected portion of the Work by written order to DB Team:

(a) Performance of Nonconforming Work;

(b) Failure to comply with any Law or Governmental Approval (including failure to handle, preserve and protect archeological, paleontological or historic resources, or failure to handle Hazardous Materials, in accordance with applicable Laws and Governmental Approvals);

(c) Certain failures to remove and replace personnel as set forth in Article 10.6.3;

(d) Failure to provide proof of required insurance coverage as set forth in Article 16.1.1.1;

(e) Failure to carry out and comply with Directive Letters;

(f) Failure to satisfy any condition to commencement of construction set forth in Article 7.6; and

(g) Failure to maintain, extend or replace performance and payment security required under the Agreement, including any P&P Bonds, unless a drawing has been made under same in the amount of the required coverage provided for in Article 16.2 and the proceeds of such drawing are held by GDOT.

GDOT will lift the suspension order promptly after DB Team fully cures and corrects the applicable breach or failure to perform.

17.3.7.2 In addition, GDOT shall have the right and authority to suspend any affected portion of the Work by written notice to DB Team for the following reasons:
(a) To comply with any court order or judgment (although it may qualify as a Compensation Event under Article 14.2(g) or a Relief Event under Article 14.1(l));

(b) GDOT’s performance of data recovery respecting archeological, paleontological or cultural resources (although it may qualify as a Relief Event under Article 14.1(i));

(c) The existence of conditions unsafe for workers, other Project personnel or the general public, including certain failures to comply with Safety Standards or perform Safety Compliance as set forth in Article 17.3.2.5; or

(d) DB Team has failed to (i) pay in full when due sums owing any Contractor for services, materials or equipment, except only for retainage provided in the relevant Contract and amounts in dispute, or (ii) deliver any certificate, release, certified payroll or affidavit of wages paid required with any Payment Request or required under this Agreement.

17.3.7.3  DB Team shall promptly comply with any such written suspension order, even if DB Team disputes the grounds for suspension. DB Team shall promptly recommence the Work upon receipt of written notice from GDOT directing DB Team to resume Work.

17.3.7.4  In addition to the protections from liability under Article 17.3.2.5, neither GDOT shall not have any liability to DB Team, and DB Team shall have no right to a Relief Event or Compensation Event, in connection with any suspension properly founded on any of the other grounds set forth in this Article 17.3.7 (except potential Relief Events or Compensation Events in the case of suspensions under Articles 17.3.7.2(a) and 17.3.7.2(b)). If GDOT orders suspension of Work on one of the foregoing grounds but it is finally determined under the process set forth under Dispute Resolution Procedures that such grounds did not exist, or if GDOT orders suspension of Work for any other reason, it shall be treated as a Directive Letter for a GDOT Change, except as provided in Article 17.3.2.5.

17.3.8 Increased Oversight, Testing, and Inspection

17.3.8.1 Upon GDOT’s delivery of notice of DB Team Default for any of the following breaches or failures to perform and DB Team’s failure to fully cure and correct, within the applicable cure period, if any, available to DB Team under Article 17.1.2, GDOT shall have the right and authority to suspend any affected portion of the Work by written order to DB Team.

17.3.8.2 If GDOT cannot confirm that: (a) a portion of the Design Work or the Construction Work is in accordance with the requirements of the DB Documents due to a lack of documented inspection or testing by DB Team as required under the DB Documents, or (b) DB Team is implementing, revising, or updating a testing and inspection plan in accordance with the DB Documents for the Design Work or the Construction Work, GDOT shall have the right but not the obligation to inform DB Team that increased monitoring, inspection, sampling, measuring, testing and oversight should be provided. If the increased monitoring, inspection, sampling, measuring, testing and oversight reveal: (i) a failure to
perform such Work in accordance with the Quality Management Plan, (ii) that the Quality Management Plan does not comply with the DB Documents, or (iii) that such Work is not in accordance with the DB Documents, DB Team shall be responsible for the costs of such increased monitoring, inspection, sampling, measuring, testing and oversight as described in this Article 17.3.8. DB Team shall correct such deficiencies and the increased monitoring, inspection, sampling, measuring, testing and oversight will continue until those deficiencies have been corrected. If such Work was performed, inspected and documented by DB Team in accordance with the DB Documents, the costs of the increased monitoring, inspection, sampling, measuring, testing and oversight shall be borne by GDOT.

17.3.8.3 If GDOT increases the level of monitoring, inspection, sampling, measuring, testing, auditing and oversight under Article 17.3.8.2 and Liquidated Damages are not provided for under this Agreement in connection with such action, then DB Team shall pay and reimburse GDOT within thirty (30) days after receipt of written demand and reasonable supporting documentation for all increased costs and fees GDOT incurs in connection with such action, including GDOT Recoverable Costs.

17.3.8.4 The foregoing does not preclude GDOT, at its sole discretion and expense, from increasing its level of monitoring, inspection, sampling, measuring, testing, auditing and oversight at other times.

17.3.9 Other Rights and Remedies

Subject to Article 17.3.11, Article 17.4.5.2 and Article 19.9, GDOT shall also be entitled to exercise any other rights and remedies available under this Agreement or any other DB Documents, or available at law or in equity.

17.3.10 Cumulative, Non-Exclusive Remedies

Subject to Articles 17.3.11, 17.4.5.2 and 19.9, each right and remedy of GDOT hereunder shall be cumulative and shall be in addition to every other right or remedy provided herein or now or hereafter existing at Law or in equity or by statute or otherwise, and the exercise or beginning of the exercise by GDOT of any one or more of any of such rights or remedies shall not preclude the simultaneous or later exercise by GDOT of any or all other such rights or remedies.

17.3.11 Limitation on Consequential Damages

17.3.11.1 Notwithstanding any other provision of the DB Documents and except as set forth in Article 17.3.11.2, to the extent permitted by applicable Law, DB Team shall not be liable for punitive damages or special, indirect or incidental, or consequential damages, whether arising out of breach of this Agreement, tort (including negligence) or any other theory of liability, and GDOT releases DB Team from any such liability, other than for Liquidated Damages for delay, as provided pursuant to this Agreement or otherwise to the extent recoverable from insurance.

17.3.11.2 The foregoing limitation on DB Team’s liability for consequential damages shall not apply to or limit any right of recovery GDOT may have respecting the following:
(a) Losses (including defense costs) to the extent (i) covered by the proceeds of insurance required to be carried pursuant to Article 16.1, (ii) covered by the proceeds of insurance actually carried by or insuring DB Team under policies solely with respect to the Project and the Work, regardless of whether required to be carried pursuant to Article 16.1, or (iii) DB Team is deemed to have self-insured the Loss pursuant to Article 16.3.3;

(b) Losses arising out of fraud, criminal conduct, intentional misconduct (which does not include any intentional DB Team Default), recklessness, bad faith or gross negligence on the part of DB Team or Contractor or any Affiliate of either;

(c) DB Team’s obligation to pay Liquidated Damages in accordance with Article 17.4 or any other provision of the DB Documents;

(d) Losses arising out of DB Team Releases of Hazardous Materials;

(e) Reserved;

(f) Amounts DB Team may be obligated to reimburse to GDOT or that are otherwise due from DB Team to GDOT under the express provisions of the DB Documents, including GDOT Recoverable Costs;

(g) Interest, late charges, fees, transaction fees and charges, penalties and similar charges that the DB Documents expressly state are due from DB Team to GDOT; and

(h) Any credits, deductions or offsets that the DB Documents expressly provide to GDOT against amounts owing DB Team.

17.4 Liquidated Damages and Nonrefundable Deductions

17.4.1 Liquidated Damages for Delayed Interim Completion Deadline(s), Substantial Completion Deadline, or Final Acceptance; Incident Based Liquidated Damages

17.4.1.1 DB Team shall be liable for and pay to GDOT Liquidated Damages with respect to any failure to achieve an Interim Completion(s) by the Interim Completion Deadline(s), Substantial Completion by the Substantial Completion Deadline, or any failure to achieve Final Acceptance by the Final Acceptance Deadline, as the same may be extended pursuant to this Agreement, or for any other breach of the requirements of the DB Documents as set forth pursuant to Section 1.1 of Exhibit 18. Such liability shall apply even though (a) a cure period remains available to DB Team under Article 17.1.2 or (b) cure occurs. The amounts of such Liquidated Damages are set forth in Exhibit 18. Such Liquidated Damages shall commence on the Substantial Completion Deadline or the Final Acceptance Deadline, as applicable, or upon the date of breach for each such incident based default pursuant to Section 1.2 of Exhibit 18, as the same may be extended pursuant to this Agreement, and shall continue to accrue until the date of Substantial Completion, the date of Final Acceptance, the cure of any such incident based breach, all as applicable, or until termination of this Agreement.
17.4.1.2 Reserved

17.4.2 Incident Based Nonrefundable Deductions

17.4.2.1 DB Team shall be liable for and pay to GDOT Nonrefundable Deductions with respect to the occurrence of the incidents listed or other breach of the requirements of the DB Documents as set forth pursuant to Section 1.3 of Exhibit 18. Unless otherwise stated in Article 17.4 nonrefundable deductions shall be applied at the time of the incident. The amounts of such Incident Based Nonrefundable Deductions are set forth in Exhibit 18.

17.4.2.2 Within ten (10) days prior to GDOT issuing any nonrefundable deductions as set forth pursuant to Sections 1.3.2 through 1.3.6 of Exhibit 18, GDOT shall execute the following:

(a) Issuance of a warning via email to the DB Team to correct the incident within seven (7) days of receipt of the email; and

(b) Issuance of a formal written warning to the DB Team to correct the incident within three (3) days. If the DB Team has failed to comply with subsection (a) to correct the incident at the end of the third day then DB Team shall be liable for and shall pay GDOT the Nonrefundable Deduction.

17.4.3 Acknowledgements Regarding Liquidated Damages

DB Team further agrees and acknowledges that:

17.4.3.1 In the event that DB Team fails to achieve Substantial Completion by the Substantial Completion Deadline or Final Acceptance by the Final Acceptance Deadline, GDOT will incur substantial damages;

17.4.3.2 In the event that DB Team causes occurrence of the incidents listed pursuant to Sections 1.2 and 1.3 of Exhibit 18, GDOT will incur substantial damages;

17.4.3.3 Such damages are incapable of accurate measurement and difficult to prove for the reasons stated in this Article 17.4;

17.4.3.4 As of the Effective Date, the amounts of Liquidated Damages under this Article 17.4 represent good faith estimates and evaluations by the Parties as to the actual potential damages that GDOT would incur as a result of late Substantial Completion or late Final Acceptance or should the incidents listed occur, and do not constitute a penalty or to otherwise operate as a deterrent for the breach of any obligations of DB Team under this Agreement;

17.4.3.5 The Parties have agreed to such Liquidated Damages in order to fix and limit DB Team’s costs and to avoid later Disputes over what amounts of damages are properly chargeable to DB Team;

17.4.3.6 Such sums are reasonable in light of the anticipated or actual harm caused by delayed Substantial Completion or delayed Final Acceptance or
should the incidents listed occur, the difficulties of the proof of loss, and the inconvenience or infeasibility of otherwise obtaining an adequate remedy;

17.4.3.7 DB Team acknowledges that such Liquidated Damages are reasonable, as determined as of the Effective Date, in light of the respective injuries and damages that may be caused by DB Team’s breach and given that such injuries and damages, which include but shall not be limited to, public inconvenience, increased administration and oversight by GDOT (and any other related agencies), and other damages to the general public, GDOT (and other related agencies); and

17.4.3.8 Such Liquidated Damages are not intended to, and do not, liquidate DB Team’s liability under the indemnification provisions of Article 16.5, even though Third-Party Claims against Indemnified Parties may arise out of the same event, breach or failure that gives rise to such Liquidated Damages.

17.4.4 Payment; Satisfaction; Waiver

17.4.4.1 GDOT shall withhold Liquidated Damages owing under this Article 17.4 from the subsequent DB Team pay application. Liquidated damages shall be withheld by GDOT without right of offset, deduction, reduction or other charge, except as provided in Article 17.6.3.

17.4.4.2 GDOT shall have the right to deduct and offset Liquidated Damages from any amounts owing DB Team to the extent provided in Article 17.3.4. GDOT also shall have the right to draw on any bond, certificate of deposit, or other security provided by DB Team pursuant to this Agreement, to satisfy Liquidated Damages not paid when due.

17.4.4.3 Permitting or requiring DB Team to continue and finish the Work or any part thereof after the Substantial Completion Deadline or Final Acceptance Deadline shall not act as a waiver of GDOT’s right to receive Liquidated Damages hereunder or any rights or remedies otherwise available to GDOT.

17.4.5 Non-Exclusive Remedy

17.4.5.1 Each item of Liquidated Damages provided under this Article 17.4 is in addition to, and not in substitution for, any other item of Liquidated Damages assessed under this Article 17.4.

17.4.5.2 GDOT’s right to, and imposition of, Liquidated Damages are in addition, and without prejudice, to any other rights and remedies available to GDOT under the DB Documents, at law or in equity respecting the breach, failure to perform or DB Team Default that is the basis for the Liquidated Damages or any other breach, failure to perform or DB Team Default, except for recovery of the monetary damage for delay that the Liquidated Damages are intended to compensate and for which Liquidated Damaged shall be the only amount recoverable on account of delay damages.
17.5 Default by GDOT; Cure Periods

17.5.1 GDOT Default

GDOT shall, subject to any applicable cure period as set forth in Article 17.5.2 below, be in breach under this Agreement upon the occurrence of any one or more of the following events or conditions (each a “GDOT Default”):

17.5.1.1 GDOT fails to make any payment due DB Team under this Agreement within thirty (30) days of the date that any such payment shall be due;

17.5.1.2 Any representation or covenant made by GDOT in this Agreement is false or materially misleading or materially inaccurate when made or omits material information when made;

17.5.1.3 GDOT fails to observe or perform any covenant, agreement, term or condition required to be observed or performed by GDOT under the DB Documents;

17.5.1.4 GDOT makes an assignment other than as permitted pursuant to Article 21.3; or

17.5.1.5 GDOT or other State Governmental Entity confiscates or appropriates the Project or any other material part of DB Team’s Interest, excluding a Termination for Convenience or any other exercise of a right of termination set forth in this Agreement.

17.5.2 Cure Periods

GDOT shall have the following cure periods with respect to the any of the conditions set forth in Article 17.5.1 above:

17.5.2.1 Respecting a GDOT Default under Article 17.5.1.1, a period of thirty (30) days after DB Team delivers to GDOT written notice of the GDOT Default;

17.5.2.2 Respecting a GDOT Default under Article 17.5.1.2 or Article 17.5.1.3, a period of sixty (60) days after DB Team delivers to GDOT written notice of the GDOT Default; provided that (a) if the GDOT Default is of such a nature that the cure cannot with diligence be completed within such time period and GDOT has commenced meaningful steps to cure immediately after receiving the default notice, GDOT shall have such additional period of time, up to a maximum cure period of one hundred eighty (180) days, as is reasonably necessary to diligently effect cure, and (b) as to Article 17.5.1.2, cure will be regarded as complete when the adverse effects of the breach are cured;

17.5.2.3 Respecting a GDOT Default under Article 17.5.1.4, a period of forty-five (45) days after DB Team delivers to GDOT written notice of the GDOT Default; and
17.5.2.4 Respecting a GDOT Default under Article 17.5.1.5, a period of thirty (30) days after DB Team delivers to GDOT written notice of the GDOT Default; provided that if the GDOT Default is of such a nature that the cure cannot with diligence be completed within such time period and GDOT has commenced meaningful steps to cure immediately after receiving the default notice, GDOT shall have such additional period of time, up to a maximum cure period of one hundred and twenty (120) days, as is reasonably necessary to diligently effect cure.

17.6 DB Team Remedies for GDOT Default

17.6.1 Termination and Suspension

17.6.1.1 Subject to Article 19.9, DB Team will have the right to suspend performance of the Work on account of a GDOT Default subject to any applicable notice and cure periods as set forth in Article 17.5.2.

17.6.1.2 Further, DB Team may upon written notice of not less than fifteen (15) days to GDOT following expiration of such applicable cure period, where such GDOT Default is continuing, exercise the right to terminate this Agreement and recover termination damages as more particularly set forth in, and subject to the terms and conditions of, Article 19.4.

17.6.2 Damages and Other Remedies

DB Team shall have and may exercise the following remedies upon the occurrence of a GDOT Default and expiration, without cure, of the applicable cure period:

17.6.2.1 If DB Team does not terminate this Agreement, then, subject to Article 17.6.4, DB Team may treat the GDOT Default as a Compensation Event on the terms and conditions set forth in Article 14.2 and GDOT shall pay the full Compensation Amount and interest in accordance with Articles 14.2.6 and 14.2.7;

17.6.2.2 If the GDOT Default is a failure to pay when due any undisputed portion of a progress payment owing under a Supplemental Agreement and GDOT fails to cure such GDOT Default within thirty (30) days after receiving from DB Team written notice thereof, DB Team shall be entitled to suspend the Work under the Supplemental Agreement until the default is cured; and

17.6.2.3 Subject to Articles 17.6.4 and 19.9, DB Team also shall be entitled to exercise any other remedies available under this Agreement or at Law or in equity, including offset rights to the extent and only to the extent available under Article 17.6.3. Subject to Articles 17.6.4 and 19.9, each right and remedy of DB Team hereunder shall be cumulative and shall be in addition to every other right or remedy provided herein or now or hereafter existing at Law or in equity or by statute or otherwise, and the exercise or beginning of the exercise by DB Team of any one or more of any of such rights or remedies shall not preclude the simultaneous or later exercise by DB Team of any or all other such rights or remedies.

17.6.3 Offset Rights
DB Team may deduct and offset any claim amount owing to it, provided such claim amount has been liquidated through the Dispute Resolution Procedures, as provided in Article 17.7 or otherwise, from and against any amounts DB Team may owe to GDOT pursuant hereto.

17.6.4 Limitations on Remedies

17.6.4.1 Notwithstanding any other provision of the DB Documents and except as forth in Article 17.6.4.2, to the extent permitted by applicable Law, GDOT shall not be liable for punitive damages or any indirect, incidental or consequential damages, whether arising out of breach of this Agreement or any DB Documents, tort (including negligence) or any other theory of liability, and DB Team releases GDOT from any such liability.

17.6.4.2 The foregoing limitation on GDOT’s liability for consequential damages shall not apply to or limit any right of recovery DB Team may have respecting the following:

(a) Losses arising out of fraud, criminal conduct, intentional misconduct (which does not include any intentional GDOT Default), recklessness, bad faith or gross negligence on the part of GDOT;

(b) Losses arising out of GDOT Release(s) of Hazardous Materials or Pre-Existing Hazardous Materials;

(c) Any amounts GDOT may owe or be obligated to reimburse under the express provisions of this Agreement for Compensation Events or events of termination;

(d) Any other specified amounts GDOT may owe or be obligated to reimburse to DB Team under the express provisions of the DB Documents;

(e) Interest and charges that the DB Documents expressly state are due from GDOT to DB Team; and

(f) Any credits, deductions or offsets that the DB Documents expressly provide to DB Team against amounts owing GDOT.

17.6.4.3 The measure of compensation available to DB Team as set forth in this Agreement for a Compensation Event or an event of termination shall constitute the sole and exclusive monetary relief and damages available to DB Team from the State or GDOT arising out of or relating to such event; and DB Team irrevocably waives and releases any right to any other or additional damages or compensation from the State or GDOT. No award of compensation or damages shall be duplicative.

17.6.4.4 Without limiting the effect of Article 17.6.4.3, in the event GDOT wrongfully withholds an acceptance or consent required under this Agreement, or wrongfully issues an objection to or disapproval of a Submittal or other matter under this Agreement, DB Team's sole remedies against GDOT shall be extensions of time to the extent provided in Article 14.1 for a Relief Event and damages to the extent provided in Article 14.2 for a Compensation Event.
17.6.5 Procedure for Payment of Judgments

Promptly after any final, non-appealable order or judgment awarding compensation or damages to DB Team, GDOT shall institute payment procedures as set forth in applicable Law.

17.7 Dispute Resolution Procedures

17.7.1 The Parties shall endeavor to resolve any Dispute that may arise between them through good faith negotiations and/or partnering in accordance with Section 2.1.2 of the Technical Provisions. If the Dispute is not resolved to the mutual satisfaction of all Parties within thirty (30) days after written notification of such Dispute, or such longer time as is mutually agreed, the dispute shall next be submitted in accordance with Article 17.7.2.

17.7.2 If, despite good faith negotiations between the Parties, any Disputes are not resolved within thirty (30) days after written notification of such Dispute, then the Dispute shall be submitted administratively to mediation as set forth below.

17.7.2.1 The Parties shall mutually select a private mediator to formally mediate the Disputes. If the Parties cannot mutually select a private mediator, GDOT shall select a mediator. Mediation shall normally be scheduled within forty-five (45) calendar days of notification of the decision by either party to submit the Dispute to mediation. GDOT and DB Team shall each pay one-half of the fees and administrative costs charged by the selected mediator. Other parties, such as GDOT and Contractors, may be invited to the mediation as may be appropriate for the mediation.

17.7.2.2 The Parties, to provide economies of scale, may mutually agree in writing to submit one or more Disputes, whether or not factually related, to a single mediation. In such event, time periods may be extended by mutual written agreement to facilitate preparation for the mediation.

17.7.2.3 If the Dispute has not been settled within forty-five (45) calendar days following written notification of the Dispute to mediation or within such other period that the Parties may agree in writing, such Dispute may be submitted to litigation by either party in accordance with Article 17.7.4.

17.7.3 No litigation may be filed by either Party concerning any Dispute prior to using the procedure described in Article 17.7.2. This procedure is a condition precedent for any Party to commence a civil action for resolution of a Dispute.

17.7.4 All litigation between the Parties arising out of or pertaining to this Agreement or its breach shall be filed, heard and decided in the Superior Court of Fulton County, Georgia, which shall have exclusive jurisdiction and venue pursuant to O.C.G.A. § 50-21-1. Each Party shall bear its own attorney’s fees and costs in any dispute or litigation arising out of or pertaining to this Agreement, and no Party shall seek or accept an award of attorney’s fees or costs.
Article 18  RESERVED

Article 19  TERMINATION

19.1 Termination for Convenience

19.1.1 GDOT may terminate this Agreement, if GDOT determines, in its sole discretion, that a termination is in GDOT’s best interest (a “Termination for Convenience”). Termination of this Agreement shall not relieve GDOT, DB Team or any Guarantor or Surety of its obligation for any claims arising prior to termination.

19.1.2 GDOT may exercise Termination for Convenience by delivering to DB Team a written notice of termination for Convenience specifying the election to terminate. Termination for Convenience shall be effective as and when provided in Exhibit 20.

19.1.3 In the event of a Termination for Convenience, DB Team will be entitled to compensation determined in accordance with Exhibit 20. Payment will be due and payable as and when provided in Exhibit 20.

19.1.4 If GDOT terminates this Agreement on grounds or in circumstances beyond GDOT’s termination rights specifically set forth in this Agreement, such termination shall be deemed a Termination for Convenience for the purpose of determining the Termination Compensation due.

19.2 Reserved

19.3 Termination for DB Team Default

19.3.1 DB Team Defaults Triggering GDOT Termination Rights

The following DB Team Defaults (each a “Default Termination Event”), and no other DB Team Defaults, shall entitle GDOT, at its sole election, to terminate this Agreement, effective immediately upon delivery of written notice of termination to DB Team. DB Team agrees and acknowledges and stipulates that any of the following DB Team Defaults would result in material and substantial harm to GDOT’s rights and interests under this Agreement and therefore constitute a material DB Team Default justifying termination if not cured within the applicable cure period, if any.

19.3.1.1 The DB Team fails to achieve Substantial Completion by the Substantial Completion Deadline, as the same may be extended pursuant to this Agreement;

19.3.1.2 There occurs any other DB Team Default for which GDOT issues a Warning Notice under Article 17.2 or 17.3, and such DB Team Default is not fully and completely cured within the applicable cure period, if any, set forth in Article 17.2.2.1 or 17.3;
There occurs any DB Team Default under Article 17.1.1.11 or 17.1.1.12; or

The DB Team fails to diligently prosecute and adhere to the requirements of any remedial action plan as provided and accepted by GDOT pursuant to Article 17.3.5.

**19.3.2 Compensation to DB Team**

If GDOT issues notice of termination of this Agreement due to a Default Termination Event, or if DB Team terminates this Agreement on grounds or in circumstances beyond DB Team’s termination rights specifically set forth in this Agreement, DB Team will be entitled to compensation to the extent, and only to the extent, provided in Exhibit 20. Payment shall be due and payable as and when provided in Exhibit 20.

**19.3.3 Finality**

If GDOT issues notice of termination of this Agreement due to a Default Termination Event, termination shall be effective and final immediately upon delivery of written notice as provided in Article 19.3.1 regardless of whether GDOT is correct in determining that GDOT has the right to terminate for DB Team Default. In the event it is determined that GDOT lacked such right, then such termination shall be treated as a Termination for Convenience as provided in Article 19.1.4 for the purpose of determining the Termination Compensation due.

**19.4 Termination for GDOT Default, Suspension of Work, Force Majeure Event, or Materially Delayed Notice to Proceed**

In the event of a material GDOT Default under Article 17.5.1.1 (failure to pay money due) that remains uncured following notice and expiration of the applicable cure period under Article 17.5.2, DB Team may deliver to GDOT a further written notice setting forth such GDOT Default and warning GDOT that DB Team may elect to terminate this Agreement and if GDOT does not cure such GDOT Default within sixty (60) days after the delivery of such notice with respect to a GDOT Default under Article 17.5.1.1. GDOT may avoid termination by effecting cure within such sixty (60) day period. Failing such cure, DB Team shall have the right to terminate this Agreement, effective immediately upon delivery of written notice of termination to GDOT. In the event of such termination, DB Team will be entitled to compensation determined in accordance with Exhibit 20. Payment shall be due and payable as and when provided in Exhibit 20. Any Dispute arising out of the determination of such compensation shall be resolved according to the Dispute Resolution Procedures.

In the event (i) GDOT orders DB Team to suspend Work on all or any material portion of the Project for a reason other than those set forth in Article 17.3.7.1, or (ii) as a result of a Force Majeure Event, and such suspension of Work continues for a period of one hundred and eighty (180) consecutive days or more, DB Team shall have the right to terminate this Agreement, effective immediately upon delivery of written notice of termination to GDOT. In the event of such termination, DB Team will be entitled to compensation determined in accordance with Exhibit 20. Payment shall be due and payable as and when
provided in Exhibit 20. Any Dispute arising out of the determination of such compensation shall be resolved according to the Dispute Resolution Procedures.

19.4.3 In the event GDOT, due to no fault of a DB Team-Related Entity or other than because the NEPA Finality Date has not occurred, does not issue NTP 1, NTP 2, or NTP 3 within three hundred and sixty-five (365) days after the anticipated issuance date set forth in Article 3.3, DB Team shall have the right to terminate this Agreement, effective immediately upon delivery of written notice of termination to GDOT. In the event of such termination, DB Team will be entitled to compensation determined in accordance with Exhibit 20. Payment shall be due and payable as and when provided in Exhibit 20. Any Dispute arising out of the determination of such compensation shall be resolved according to the Dispute Resolution Procedures.

19.4.4 If DB Team issues notice of termination of this Agreement due to a material GDOT Default under Article 17.5.1.1, termination shall be effective and final immediately upon delivery as provided in Article 19.4.1 regardless of whether DB Team is correct in determining that it has the right to terminate for such GDOT Default. In the event it is determined that DB Team lacked such right, then such termination shall be treated as a termination due to material DB Team Default and Article 19.3.2 shall govern the measure of the Termination Compensation.

19.5 Termination Procedures and Duties

19.5.1 Upon expiration of the Term or any earlier termination of this Agreement for any reason, including due to GDOT Default, the provisions of this Article 19.5 shall apply. DB Team shall timely comply with such provisions independently of, and without regard to, the timing for determining, adjusting, settling and paying any amounts due DB Team or GDOT on account of termination.

19.5.2 In any case where notice of termination precedes the effective Early Termination Date:

19.5.2.1 DB Team shall continue performing the Work in accordance with, and without excuse from, all the standards, requirements and provisions of the DB Documents, and without curtailment of services, quality and performance;

19.5.2.2 Reserved

19.5.2.3 At GDOT’s option, it may increase the level of its monitoring, inspection, sampling, measuring, testing, auditing and oversight of the Project and DB Team’s compliance with the obligations under the DB Documents, to such level as GDOT reasonably sees fit to protect against curtailment of services, quality and performance; and

19.5.2.4 Within three (3) days after receipt of a notice of termination, DB Team shall meet and confer with GDOT for the purpose of developing an interim transition plan for the orderly transition of Work, demobilization and transfer of the Project control to GDOT. The Parties shall use diligent efforts to complete preparation of the interim transition plan within fifteen (15) days after the date DB
Team receives the notice of termination. The Parties shall use diligent efforts to complete a final transition plan within thirty (30) days after such date. The transition plan shall be in form and substance acceptable to GDOT in its good faith discretion and shall include and be consistent with the other provisions and procedures set forth in this Article 19.5, all of which procedures DB Team shall immediately follow, regardless of any delay in preparation or acceptance of the transition plan.

19.5.3 On the Termination Date, or as soon thereafter as is possible, DB Team shall relinquish and surrender full control and possession of the Project to GDOT, and shall cause all persons and entities claiming under or through DB Team to do likewise, in at least the condition required by the Termination turnover requirements.

19.5.4 On the later of the Termination Date or the date DB Team relinquishes full control and possession, GDOT shall assume responsibility, at its expense, for the Project, subject to any rights to damages that GDOT has against DB Team where the termination is due to a Default Termination Event.

19.5.5 Reserved

19.5.6 Reserved

19.5.7 Within thirty (30) days after notice of termination is delivered, DB Team shall provide GDOT with true and complete list of all materials, goods, machinery, equipment, parts, supplies and other property in inventory or storage (whether held by DB Team or any Person or entity on behalf of or for the account of DB Team) for use in or respecting the Work or the Project, or on order or previously completed but not yet delivered from Suppliers for use in or respecting the Work or the Project. In addition, on or about the Termination Date, DB Team shall transfer title and deliver to GDOT or GDOT’s Authorized Representative, through bills of sale or other documents of title, as directed by GDOT, all such materials, goods, machinery, equipment, parts, supplies and other property.

19.5.8 DB Team shall take all action that may be necessary, or that GDOT may direct, for the protection and preservation of the Project, the Work and such materials, goods, machinery, equipment, parts, supplies and other property.

19.5.9 On or about the Termination Date, DB Team shall execute and deliver to GDOT the following, together with an executed bill of sale or other written instrument, in form and substance acceptable to GDOT, acting reasonably, assigning and transferring to GDOT all of DB Team’s right, title and interest in and to the following:

19.5.9.1 All completed or partially completed drawings (including plans, elevations, sections, details and diagrams), specifications, designs, Design Documents, as-built and record plans, surveys, and other documents and information pertaining to the design or construction of the Project or the Utility Adjustments;
19.5.9.2 All samples, borings, boring logs, geotechnical data and similar data and information relating to the Project;

19.5.9.3 All books, records, reports, test reports, studies and other documents of a similar nature relating to the Work, the Project;

19.5.9.4 All data and information relating to the use of the Project, including all studies, reports, and other information provided that the transfer of any Intellectual Property shall be subject to Article 22.4; and

19.5.9.5 All other work product and Intellectual Property used or owned by DB Team or any Affiliate relating to the Work, the Project, provided that the transfer of any Intellectual Property shall be subject to Article 22.4.

19.5.10 Reserved

19.5.11 On or about the Termination Date, DB Team shall execute and deliver to GDOT a written assignment, in form and substance acceptable to GDOT, acting reasonably, of all DB Team’s right, title and interest in and to all warranties, claims and causes of action held by DB Team against third parties in connection with the Project or the Work.

19.5.12 DB Team shall otherwise assist GDOT in such manner as GDOT may require prior to and for a reasonable period following the Termination Date to ensure the orderly transition of the Project and its management to GDOT.

19.6 Reserved

19.7 Contracts and Agreements

19.7.1 Regardless of GDOT’s prior actual or constructive knowledge thereof, no contract or agreement to which DB Team is a party (unless GDOT is also a party thereto) as of the Termination Date shall bind GDOT, unless GDOT elects to assume such contract or agreement in writing. Except in the case of GDOT’s express written assumption, no such contract or agreement shall entitle the contracting party to continue performance of work or services respecting the Project following DB Team’s relinquishment to GDOT of possession and control of the Project, or to any claim, legal or equitable, against GDOT.

19.8 Liability After Termination; Final Release

19.8.1 No termination of this Agreement shall excuse either Party from any liability arising out of any default as provided in this Agreement that occurred prior to termination. Notwithstanding the foregoing, any termination of this Agreement shall automatically extinguish any claim of DB Team to payment of Compensation Amounts for adverse cost and revenue impacts accruing after the Early Termination Date from Compensation Events that occurred prior to termination.

19.8.2 If this Agreement is terminated under Article 19.1, 19.3.1, 19.4, or 19.11, then GDOT’s payment to DB Team of the amounts required thereunder if
any) shall constitute full and final satisfaction of, and upon payment GDOT shall be forever released and discharged from, any and all claims, causes of action, suits, demands and Losses, known or unknown, suspected or unsuspected, that DB Team may have against GDOT arising out of or relating to this Agreement or termination thereof, or the Project, are unresolved at the time of such payment and are not related to termination or Termination Compensation. Upon such payment, DB Team shall execute and deliver to GDOT all such releases and discharges as GDOT may reasonably require to confirm the foregoing, but no such written release and discharge shall be necessary to give effect to the foregoing satisfaction and release.

19.9 Exclusive Termination Rights

This Article 19, together with the express provisions on termination set forth in Articles 17.3.1 and 17.6.1, contain the entire and exclusive provisions and rights of GDOT and DB Team regarding termination of this Agreement, and any and all other rights to terminate at law or in equity are hereby waived to the maximum extent permitted by Law.

19.10 Access to Information

DB Team shall conduct all discussions and negotiations to determine any Termination Compensation, and shall share with GDOT all data, documents and information pertaining thereto, on an Open Book Basis.

19.11 Termination by Court Ruling

19.11.1 Except in the circumstances described in Exhibit 20, Termination by Court Ruling means, and becomes effective upon, (a) issuance of a final order by a court of competent jurisdiction to the effect that this Agreement is void and/or unenforceable or impossible to perform in its entirety, (b) issuance of a final order by a court of competent jurisdiction upholding the binding effect on DB Team or GDOT of a Change in Law that causes impossibility of performance of a fundamental obligation by DB Team or GDOT under the DB Documents or impossibility of exercising a fundamental right of DB Team or GDOT under the DB Documents, (c) occurrence of the circumstances described in Article 24.13.2, or (d) issuance of a final order by a court of competent jurisdiction to the effect that a material provision under the Estate for Years, Intergovernmental Agreement or the DB Documents is void and/or unenforceable so as to deprive DB Team of its ability to exercise a fundamental right granted to DB Team under the DB Documents and such inability resulting from such order cannot be otherwise remedied through a Compensation Event, Relief Event or other contractual remedy. The final court order shall be treated as the notice of termination.

19.11.2 Once Termination by Court Ruling becomes effective, GDOT and DB Team shall cooperate to implement Articles 19.5, 19.8, and 19.10.

19.11.3 Notwithstanding Article 19.11.2, if a Termination by Court Ruling occurs, DB Team shall be entitled to compensation to the extent, and only to the extent, provided in Exhibit 20. Payment shall be due and payable as and
when provided in Exhibit 20. Any Dispute arising out of the determination of such compensation shall be resolved according to the Dispute Resolution Procedures.

Article 20    RESERVED

Article 21    ASSIGNMENT AND TRANSFER

21.1 Restrictions on Assignment, Subletting and Other Transfers

21.1.1 DB Team shall not voluntarily or involuntarily sell, assign, convey transfer, pledge, mortgage or otherwise encumber the DB Team's Interest or any portion thereof without GDOT's prior written acceptance (including under any Direct Agreement), except:

21.1.1.1 To any entity that is under the same ultimate management control as DB Team.

21.1.2 DB Team shall not grant any other special occupancy or use of the Project to any other Person that is not in the ordinary course of DB Team performing the Work, without GDOT's prior written acceptance.

21.1.3 Any sale, assignment, conveyance, transfer, pledge, mortgage, encumbrance, or grant of other special occupancy or use in violation of this provision shall be null and void ab initio and GDOT may, by Warning Notice, declare any such attempted action to be a material DB Team Default.

21.2 Standards and Procedures for GDOT Acceptance

21.2.1 Where GDOT's prior acceptance is required for a proposed sale, assignment, conveyance, transfer, pledge, mortgage, encumbrance, sublease or grant of other special occupancy or use, or for any proposed Change of Control, GDOT may withhold or condition its acceptance in its sole discretion. Any such decision of GDOT to withhold consent shall be final, binding and not subject to the Dispute Resolution Procedures.

21.2.2 Thereafter, GDOT shall not unreasonably withhold its acceptance thereto. Among other reasonable factors and considerations, it shall be reasonable for GDOT to withhold its acceptance if:

21.2.2.1 DB Team fails to demonstrate to GDOT's reasonable satisfaction that the proposed assignee, sublessee, grantee or transferee, or the proposed transferee of rights and/or equity interests that would amount to a Change of Control (for purposes of these Articles 21.2 through 21.5, collectively the "Transferee"), and its proposed contractors (a) have the financial resources, qualifications and experience to timely perform DB Team's obligations under the DB Documents and Principal Project Documents and (b) are in compliance with GDOT's rules, regulations and adopted written policies regarding organizational conflicts of interest;
21.2.2.2 Less than all of DB Team’s Interest is proposed to be assigned, conveyed, transferred, pledged, mortgaged, encumbered, or granted; or

21.2.2.3 At the time of the proposed sale, assignment, conveyance, transfer, pledge, mortgage, encumbrance, sublease or grant of other special occupancy or use requiring GDOT’s prior acceptance, or of any proposed Change of Control, there exists any uncured DB Team Default or any event or circumstance that with the lapse of time, the giving of notice or both would constitute a DB Team Default, unless GDOT receives from the proposed Transferee assurances of cure and performance acceptable to GDOT in its good faith discretion.

21.2.3 GDOT will accept or disapprove within thirty (30) days after it receives from DB Team a Submittal consisting of a request for acceptance together with (a) a reasonably detailed description of the proposed transaction, (b) such information, evidence and supporting documentation as GDOT may request concerning the identity, financial resources, qualifications, experience and potential conflicts of interest of the proposed Transferee and its proposed contractors and (c) such evidence of organization and authority, and such incumbency certificates, certificates regarding debarment or suspension, and other certificates, representations and warranties as GDOT may reasonably request. GDOT will evaluate the identity, financial resources, qualifications, experience and potential conflicts of interest using the same standards and criteria that it is then currently applying, or if there is no current application, then the same standards and criteria it most recently applied, to the evaluation of Persons responding to GDOT requests for qualifications for concession or similar agreements for comparable projects and facilities.

21.2.4 If for any reason GDOT does not act within such thirty (30) day period, or any extension thereof by mutual agreement of the Parties, then the provisions of Article 6.3.4.2 shall apply.

21.3 Assignment by GDOT

GDOT may assign all or any portion of its rights, title and interests in and to the DB Documents, payment and performance bond(s), guarantees, and other security for payment or performance, (a) without DB Team’s consent, to any other Person that succeeds to the governmental powers and authority of GDOT, and (b) to others with the prior written consent of DB Team.

21.4 Notice and Assumption

21.4.1 Assignments and transfers of the DB Team’s Interest permitted under this Article 21 (other than pursuant to Article 21.1.1.1) or otherwise accepted in writing by GDOT shall be effective only upon GDOT’s receipt of written notice of the assignment or transfer and a written recordable instrument executed by the Transferee, in form and substance acceptable to GDOT, in which the Transferee, without condition or reservation, assumes all of DB Team’s obligations, duties and liabilities under the DB Documents and agrees to perform and observe all provisions thereof applicable to DB Team.

21.4.2 Each Transferee, including any Person who acquires the DB Team’s Interest pursuant to foreclosure, transfer in lieu of foreclosure or similar
proceeding, shall take the DB Team's Interest subject to, and shall be bound by, the Management Plans, the Key Contracts, the Standard Utility Agreements, all agreements between the transferor and railroads, the Governmental Approvals, and all agreements between the transferor and Governmental Entities with jurisdiction over the Project or the Work, except to the extent otherwise accepted by GDOT in writing in its good faith discretion.

21.4.3 Except with respect to assignments and transfers pursuant to foreclosure, transfer in lieu of foreclosure or similar proceeding, the transferor and Transferee shall give GDOT written notice of the assignment not less than thirty (30) days prior to the effective date thereof.

21.5 Change of Organization or Name

21.5.1 DB Team shall not change the legal form of its organization in a manner that adversely affects GDOT’s rights, protections and remedies under the DB Documents without the prior written acceptance of GDOT, which consent may be granted or withheld in GDOT’s sole discretion.

21.5.2 In the event either Party changes its name, such Party agrees to promptly furnish the other Party with written notice of change of name and appropriate supporting documentation.

Article 22 RECORDS AND AUDITS; INTELLECTUAL PROPERTY

22.1 Maintenance and Inspection of Records

22.1.1 DB Team shall keep and maintain at a single location as approved by GDOT all books, records and documents relating to the Project, Utility Adjustments or Work, including copies of all original documents delivered to GDOT, as set forth in Exhibit 24. DB Team shall keep and maintain such books, records and documents in accordance with applicable provisions of the DB Documents, Section 2 of the Technical Provisions, and of the Management Plans, and in accordance with Good Industry Practice. DB Team shall notify GDOT where such records and documents are kept.

22.1.2 DB Team shall make all its books, records and documents available for inspection by GDOT, its representatives and legal counsel at DB Team's principal offices in Georgia, at all times during normal business hours, without charge. GDOT may conduct any such inspection upon forty-eight (48) hours' prior written notice, or unannounced and without prior notice where there is good faith suspicion of fraud. The right of inspection includes the right to make extracts and take notes. The provisions of this Article 22.1.2 are subject to the following:

22.1.2.1 DB Team reserves the right to assert exemptions from disclosure for information that would be exempt under applicable State Law from discovery or introduction into evidence in legal actions; and
22.1.2.2 Unless otherwise lawfully required by the FHWA, federal Law or the Open Government Laws, DB Team may make available copies of books, records and documents containing trade secrets and confidential proprietary information with such information redacted. Unless otherwise lawfully required by the FHWA, federal Law or the Open Government Laws, GDOT shall have no right to make extracts of such trade secrets and confidential proprietary information except in connection with resolution of Disputes.

22.1.2.3 DB Team shall retain records and documents for a minimum of five (5) years after the date the record or document is generated; provided that if the DB Documents or applicable Law specify any longer time period for retention of particular records, such time period shall control. With respect to records and documents generated prior to Final Acceptance, the time period for retention shall commence upon Final Acceptance. Notwithstanding the foregoing, all records which relate to any actions brought forth under the Dispute Resolution Procedures shall be retained and made available until any later date that such actions are finally resolved. Refer to Attachment 1 to Exhibit 8 regarding applicable Federal Requirements.

22.2 Audits

22.2.1 GDOT shall have such rights to review and audit DB Team, its Contractors and their respective books and records as and when GDOT deems necessary for purposes of verifying compliance with the DB Documents and applicable Law. Without limiting the foregoing, GDOT shall have the right to audit DB Team’s Management Plans and compliance therewith, including the right to inspect Work and/or activities and to verify the accuracy and adequacy of the Management Plans and its component parts, plans and other documentation. GDOT may conduct any such audit of books and records upon forty-eight (48) hours’ prior written notice, or unannounced and without prior notice where there is good faith suspicion of fraud.

22.2.2 All claims filed against GDOT shall be subject to audit at any time following the filing of the claim. The audit may be performed by employees of GDOT or by an auditor under contract with GDOT. Notice shall not be required before commencing any audit prior to sixty (60) days after the expiration of the term of this Agreement. Thereafter, GDOT shall provide twenty (20) days’ notice to DB Team, any Contractors or their respective agents before commencing an audit. DB Team, Contractors or their agents shall provide adequate facilities, acceptable to GDOT, for the audit during normal business hours. DB Team, Contractors or their agents shall cooperate with the auditors. Failure of DB Team, Contractors or their agents to maintain and retain sufficient books and records to allow the auditors to verify all or a portion of the claim or to permit the auditor access to such books and records shall constitute a waiver of the claim and shall bar any recovery thereunder. At a minimum, the auditors shall have available to them the following documents relating to the claim:

(a) Daily time sheets and supervisor’s daily reports;

(b) Union agreements;
(c) Insurance, welfare, and benefits records;
(d) Payroll registers;
(e) Earnings records;
(f) Payroll tax forms;
(g) Material invoices and requisitions;
(h) Material cost distribution work sheet;
(i) Equipment records (list of company equipment, rates, etc.);
(j) Contractors’ (including Suppliers’) invoices;
(k) Contractors’ and agents’ payment certificates;
(l) Canceled checks (payroll and Suppliers);
(m) Job cost report;
(n) Job payroll ledger;
(o) General ledger;
(p) Cash disbursements journal;
(q) All documents that relate to each and every claim together with all
documents that support the amount of damages as to each claim; and
(r) Work sheets used to prepare the claim establishing (a) the cost components of the claim, including labor, benefits and insurance, materials, equipment, Contractors, all documents that establish the time periods, individuals involved, the hours for the individuals, and the rates for the individuals, and (b) the lost revenue components of the claim.

22.2.3 Full compliance by DB Team with the provisions of this Article 22.2 is a contractual condition precedent to DB Team’s right to seek relief on a Dispute under Article 17.7.

22.2.4 Any rights of the FHWA to review and audit DB Team, its Contractors and their respective books and records are set forth in Attachment 1 to Exhibit 8.

22.2.5 GDOT’s right of audit include the right to observe the business operations of DB Team and its Contractors to confirm the accuracy of books and records.

22.2.6 DB Team shall include in the Quality Management Plans internal procedures to facilitate review and audit by GDOT and, if applicable, FHWA.
22.2.7 DB Team represents and warrants the completeness and accuracy in all material respects of all information it or its agents provides in connection with GDOT audits, and shall cause all Contractors other than Governmental Entities acting as Contractors to warrant the completeness and accuracy in all material respects of all information such Contractors provide in connection with GDOT audits.

22.2.8 DB Team's internal and third-party quality and compliance auditing responsibilities shall be set forth in the Quality Management Plans.

22.2.9 Nothing in the DB Documents shall in any way limit the constitutional and statutory powers, duties and rights of elected State officials, including the independent rights of the State Auditor, in carrying out his or her legal authority. DB Team understands and acknowledges that (a) the State auditor may conduct an audit or investigation of any entity receiving funds from the State directly under this Agreement or indirectly through a Contract, (b) acceptance of funds directly under this Agreement or indirectly through a Contract acts as acceptance of the authority of the State auditor to conduct an audit or investigation in connection with those funds, and (c) an entity that is the subject of an audit or investigation must provide the State auditor with access to any information the State auditor considers relevant to the investigation or audit.

22.3 Open Government Laws and Freedom of Information Act

22.3.1 DB Team acknowledges and agrees that all Submittals, records, documents, drawings, Plans, specifications and other materials in GDOT's possession, including materials submitted by DB Team to GDOT (whether directly or indirectly), are subject to the provisions of the Open Government Laws, subject only to certain exceptions and exemptions contained therein. DB Team also acknowledges that, pursuant to O.C.G.A. § 50-18-70(a), “records received or maintained by a private person, firm, corporation, or other private entity in the performance of a service or function for or on behalf of an agency, a public agency, or a public office shall be subject to disclosure to the same extent that such records would be subject to disclosure if received or maintained by such agency, public agency, or public office.” If DB Team believes information or materials submitted or otherwise made available to GDOT constitute trade secrets, proprietary information or other information that is not subject to the Open Government Laws or is excepted from disclosure under the Open Government Laws, DB Team shall be solely responsible for specifically and conspicuously designating that information by placing “CONFIDENTIAL” in the center header of each such document or page affected, as it determines to be appropriate. Any specific proprietary information, trade secrets or confidential commercial and financial information shall be clearly identified as such, and shall be accompanied by a concise statement of reasons supporting the claim. Nothing contained in this Article 22.3.1 shall modify or amend requirements and obligations imposed on GDOT by the Open Government Laws or other applicable Law, and the provisions of the Open Government Laws or other Laws shall control in the event of a conflict between the procedures described above and the applicable Law. DB Team is advised to contact legal counsel concerning such Law and its application to DB Team.
22.3.2 If GDOT receives a request for public disclosure of materials marked “CONFIDENTIAL,” GDOT (as the case may be) will endeavor to notify DB Team of the request. DB Team may seek a protective order or other appropriate remedy. If GDOT determines in good faith that the materials identified as “CONFIDENTIAL” are not exempt from the Open Government Laws, GDOT will release the requested information within the applicable statutory time period, unless otherwise directed by an order of a court of competent jurisdiction. GDOT shall make the final determination regarding whether the requested information is to be disclosed or withheld.

22.3.3 In the event of any proceeding or litigation concerning the disclosure of any material submitted by DB Team to GDOT, DB Team shall be fully responsible for otherwise prosecuting or defending any action concerning the materials at its sole cost and risk; provided, however, that the Attorney General shall represent GDOT, which will participate in the litigation in such manner as they each may deem necessary or desirable. Except in the case of GDOT’s voluntary intervention in litigation, DB Team shall pay and reimburse GDOT (as the case may be) within thirty (30) days after receipt of written demand and reasonable supporting documentation for all costs and fees, including attorneys’ fees and costs, GDOT incurs in connection with any litigation, proceeding or request for disclosure.

22.3.4 DB Team further acknowledges and agrees that all Submittals, records, documents, drawings, Plans, specifications and other materials in FHWA’s possession may also be subject to disclosure under federal Law, including the Freedom of Information Act. DB Team’s rights and obligations with respect to such disclosure shall be in accordance with such federal Law.

22.4 Intellectual Property

22.4.1 All Proprietary Intellectual Property, including with respect to Technology Enhancements, Source Code and Source Code Documentation, shall remain exclusively the property of DB Team or its Affiliates or Contractors that supply the same, notwithstanding any delivery of copies thereof to GDOT.

22.4.2 GDOT shall have and is hereby granted a nonexclusive, transferable, irrevocable, fully paid up right and license to use, reproduce, modify, adapt and disclose, and sublicense others to use, reproduce, modify, adapt and disclose, the Proprietary Intellectual Property of DB Team, including with respect to Technology Enhancements, Source Code and Source Code Documentation, solely in connection with the Project and any Highway, tolled or not tolled, owned and operated by GDOT or a State or regional Governmental Entity.

22.4.3 Subject to the license and rights granted to GDOT pursuant to Article 22.4.2, GDOT shall not at any time sell any Proprietary Intellectual Property of DB Team or use, reproduce, modify, adapt and disclose, or allow any party to use, reproduce, modify, adapt and disclose, any such Proprietary Intellectual Property for any other purpose not consistent with Article 22.4.2 above.
22.4.4 The right to transfer the license is limited to any Governmental Entity that succeeds to the power and authority of GDOT generally or with respect to the Project.

22.4.5 The right to sublicense is limited to State or regional Governmental Entities that own or operate a Highway or other road, tolled or not tolled, and to the concessionaires, contractors, subcontractors, employees, attorneys, consultants and agents that are retained by or on behalf of GDOT or any such State or regional Governmental Entity in connection with the Project or another Highway or other road, tolled or untolled. All such sublicenses shall be subject to Article 22.4.6.

22.4.6 Subject to Article 22.3, GDOT shall:

22.4.6.1 Not disclose any Proprietary Intellectual Property of DB Team to any Person other than authorized transferees and sublicensees who agree to be bound by any confidentiality obligations of GDOT relating thereto;

22.4.6.2 Enter into a commercially reasonable confidentiality agreement if requested by DB Team with respect to the licensed Proprietary Intellectual Property; and

22.4.6.3 Include, or where applicable require such State or regional Governmental Entity to include, in the contract with the sublicensee its covenant to employ sound business practices no less diligent than those used for its own confidential information, and no less diligent than required by commercially reasonable standards of confidentiality, to protect all Proprietary Intellectual Property of DB Team and other materials provided under the sublicense against disclosure to third parties not in receipt of a sublicense, and to use the sublicense only for the permitted purposes.

22.4.7 Notwithstanding any contrary provision of the DB Documents, in no event shall GDOT or any of their respective directors, officers, employees, consultants or agents be liable to DB Team, any Affiliate or any Contractor for any damages, including loss of profit, arising out of breach of the duty of confidentiality set forth in Article 22.4.6 if such breach is not the result of gross negligence or intentional misconduct or is required under the provisions of the Open Government Laws or a court order or other legal requirement.

22.4.8 DB Team shall continue to have a full and complete right to use any and all duplicates or other originals of its Proprietary Intellectual Property in any manner it chooses.

22.4.9 With respect to any Proprietary Intellectual Property, including with respect to Technology Enhancements, Source Code and Source Code Documentation, owned by a Person other than DB Team, including any Affiliate, and other than GDOT or a Governmental Entity acting as a Contractor, DB Team shall obtain from such owner, concurrently with execution of any contract, subcontract or purchase order with such owner or with the first use or adaptation of the Proprietary Intellectual Property in connection with the Project, for DB Team and GDOT, nonexclusive, transferable, irrevocable, fully paid up licenses to use,
reproduce, modify, adapt and disclose such Proprietary Intellectual Property solely in connection with the Project and any Highway, tolled or not tolled, owned and operated by GDOT or a State or regional Governmental Entity, of at least identical scope, purpose, duration and applicability as the license granted under Article 22.4.1. The foregoing requirement shall not apply, however, to mass-marketed software products (sometimes referred to as “shrink wrap software”) owned by such a Person where such a license cannot be extended to GDOT using commercially reasonable efforts. The limitations on sale, transfer, sublicensing and disclosure by GDOT set forth in Articles 22.4.3 through 22.4.6 shall also apply to GDOT’s licenses in such Proprietary Intellectual Property.

22.5 Reserved

Article 23 FEDERAL REQUIREMENTS

23.1 Compliance with Federal Requirements

DB Team shall comply and require its Contractors to comply with all Federal Requirements applicable to transportation projects that receive federal credit or funds, including those set forth in Exhibit 8. In the event of any conflict between any applicable Federal Requirements and the other requirements of the DB Documents, the Federal Requirements shall prevail, take precedence and be in force over and against any such conflicting provisions.

23.2 Role of and Cooperation with FHWA

DB Team acknowledges and agrees that FHWA will have certain approval rights with respect to the Project, including the right to provide certain oversight and technical services with respect to the Work. DB Team shall cooperate with FHWA in the reasonable exercise of FHWA’s duties and responsibilities in connection with the Project and shall provide such assistance and information as may be required by GDOT to comply with FHWA reporting requirements.

Article 24 MISCELLANEOUS

24.1 Taxes

DB Team shall pay, prior to delinquency, all applicable Taxes. DB Team shall have no right to a Compensation Event or a Relief Event due to its misinterpretation of Laws respecting Taxes or incorrect assumptions regarding applicability of Taxes.

24.2 Amendments

The DB Documents may be amended only by a written instrument duly executed by the Parties or their respective successors or assigns, except to the extent expressly provided otherwise in this Agreement.

24.3 Waiver

24.3.1 No waiver of any term, covenant or condition of this Agreement or the other DB Documents shall be valid unless in writing and signed by the obligee Party.
24.3.2 The exercise by a Party of any right or remedy provided under this Agreement or the other DB Documents shall not waive or preclude any other or further exercise thereof or the exercise of any other right or remedy. No waiver by any Party of any right or remedy under this Agreement or the other DB Documents shall be deemed to be a waiver of any other or subsequent right or remedy under this Agreement or the other DB Documents. The consent by one Party to any act by the other Party requiring such consent shall not be deemed to render unnecessary the obtaining of consent to any subsequent act for which consent is required, regardless of whether similar to the act for which consent is given.

24.3.3 Except as provided otherwise in the DB Documents, no act, delay or omission done, suffered or permitted by one Party or its agents shall be deemed to waive, exhaust or impair any right, remedy or power of such Party hereunder, or to relieve the other Party from the full performance of its obligations under this Agreement or the other DB Documents.

24.3.4 Either Party’s waiver of any breach or failure to enforce any of the terms, covenants, conditions or other provisions of the DB Documents at any time shall not in any way limit or waive that Party’s right thereafter to enforce or compel strict compliance with every term, covenant, condition or other provision, any course of dealing or custom of the trade notwithstanding. Furthermore, if the Parties make and implement any interpretation of the DB Documents without documenting such interpretation by an instrument in writing signed by both Parties, such interpretation and implementation thereof will not be binding in the event of any future Disputes.

24.3.5 Subject to Article 14.2.6, the acceptance of any payment or reimbursement by a Party shall not waive any preceding or then-existing breach or default by the other Party of any term, covenant or condition of this Agreement or the other DB Documents, other than the other Party’s prior failure to pay the particular amount or part thereof so accepted, regardless of the paid party’s knowledge of such preceding or then-existing breach or default at the time of acceptance of such payment or reimbursement. Nor shall such acceptance continue, extend or affect: (a) the service of any notice, any Disputes or final judgment; (b) any time within which the other Party is required to perform any obligation; or (c) any other notice or demand.

24.4 Independent Contractor

24.4.1 DB Team is an independent contractor, and nothing contained in the DB Documents shall be construed as constituting any relationship with GDOT other than that of an independent contractor under this Agreement.

24.4.2 Nothing in the DB Documents is intended or shall be construed to create any partnership, joint venture or similar relationship between GDOT and DB Team; and in no event shall either Party take a position in any tax return or other writing of any kind that a partnership, joint venture or similar relationship exists. While the term “public-private partnership” may be used on occasion to refer to contractual relationships of the type hereby created, the Parties do not thereby express any intention to form or hold themselves out as a

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facto partnership, joint venture or similar relationship, to share net profits or net losses, or to give GDOT control or joint control over DB Team’s financial decisions or discretionary actions concerning the Project and Work.

24.4.3 In no event shall the relationship between GDOT and DB Team be construed as creating any relationship whatsoever between GDOT and DB Team’s employees. Neither DB Team nor any of its employees is or shall be deemed to be an employee of GDOT. Except as otherwise specified in the DB Documents, DB Team has sole authority and responsibility to employ, discharge and otherwise control its employees and has complete and sole responsibility as a principal for its agents, for all Contractors and for all other Persons that DB Team or any Contractor hires to perform or assist in performing the Work.

24.5 Successors and Assigns

The DB Documents shall be binding upon and inure to the benefit of GDOT and DB Team and their permitted successors, assigns and legal representatives.

24.6 Designation of Representatives; Cooperation with Representatives

24.6.1 GDOT and DB Team shall each designate an individual or individuals who shall be authorized to make decisions and bind the Parties on matters relating to the DB Documents (“Authorized Representative”). In addition, for purposes of Project administration and oversight to be performed by GDOT as provided in this Agreement, GDOT shall designate an individual or individuals who shall be authorized to make decisions and bind GDOT and upon such person(s) direction DB Team may rely. Exhibit 22 provides the initial Authorized Representative designations. A Party may change such designations by a subsequent writing delivered to the other Party in accordance with Article 24.11. For purposes of this Agreement, the Parties, except where expressly stated to the contrary, all communications and deliveries, including submittals, shall be through the respective Authorized Representative for each party.

24.6.2 DB Team shall cooperate with GDOT and all representatives of GDOT designated as described above.

24.7 Survival

DB Team’s and GDOT’s representations, covenants, warranties, the dispute resolution provisions contained in Article 17.7, the express obligations of the Parties following termination, and all other provisions which by their inherent character should survive expiration or earlier termination of this Agreement and/or completion of the Work shall survive the expiration or earlier termination of this Agreement and/or the completion of the Work. The provisions of Article 17.7 shall continue to apply after expiration or earlier termination of this Agreement to all Disputes between the parties arising out of the DB Documents.

24.8 Limitation on Third-Party Beneficiaries

24.8.1 It is not intended by any of the provisions of the DB Documents to create any third-party beneficiary hereunder or to authorize anyone not a Party hereto to maintain a suit for personal injury or property damage pursuant to the
terms or provisions hereof, except to the extent provided in Article 24.9.2 and other specific provisions (such as the warranty and indemnity provisions) that identify third parties and state that they are entitled to benefits hereunder. Except as otherwise provided in this Article 24.8, the duties, obligations and responsibilities of the Parties to the DB Documents with respect to third parties shall remain as imposed by Law. The DB Documents shall not be construed to create a contractual relationship of any kind between GDOT and a Contractor or any Person other than DB Team.

24.8.2 GDOT shall be a third-party beneficiary, and entitled to the benefits, with respect to the rights under the DB Documents related to the following:

24.8.2.1 Oversight, review, inspection, testing, monitoring, acceptance, and enforcement of DB Team’s obligations to perform the design and construction of the Project in accordance with the DB Documents and applicable Law.

24.8.2.2 Review, audit, inspection and copying of data, information, documents, books and records of DB Team and any other DB Team-Related Entity.

24.8.2.3 Step in rights upon the occurrence of a DB Team Default.

24.9 No Personal Liability of GDOT Employees; No Tort Liability

24.9.1 GDOT’s officers, employees, representatives are acting solely as agents and representatives of such respective entities, as applicable, when carrying out the provisions of or exercising the power or authority granted to them under this Agreement and the DB Documents. They shall not be liable either personally or as employees of GDOT for actions in their ordinary course of employment.

24.9.2 The Parties agree to provide to each other with written notice of any claim which such Party may receive from any third party relating in any way to the matters addressed in this Agreement, and shall otherwise provide notice in such form and within such period as is required by Law.

24.10 Governing Law

The DB Documents shall be governed by and construed in accordance with the laws of the State of Georgia.

24.11 Notices and Communications

24.11.1 Notices under the DB Documents shall be in writing and: (a) delivered personally; (b) sent by certified mail, return receipt requested; (c) sent by a recognized overnight mail or courier service, with delivery receipt requested, or (d) sent by facsimile or email communication followed by a hard copy and with receipt confirmed by telephone, to the following addresses (or to such other address as may from time to time be specified in writing by such Person):
24.11.2 All notices, correspondence and other communications to DB Team shall be delivered to the following address or as otherwise directed by DB Team's Authorized Representative:

Mr. Pete Kelley
Superior Construction Company Southeast, LLC
7072 Business Park Boulevard North
Jacksonville, FL 32256
Telephone: 813-207-2107
Facsimile: n/a
E-mail: pkelley@superiorconstruction.com

24.11.3 All notices, correspondence, submittals, transmittals and any other communications shall be directed to GDOT's Authorized Representative. All notices, correspondence, submittals, transmittals, and other communications to GDOT shall be marked as regarding the "I-20 at Savannah River Project" and shall be delivered to the following addresses or as otherwise directed by GDOT's Authorized Representative:

Darryl D. VanMeter, P.E.
Georgia Department of Transportation
Office of Innovative Delivery
600 West Peachtree Street, Floor 19
Atlanta, Georgia 30308
E-mail: dvanmeter@dot.ga.gov

In addition, copies of all notices regarding Disputes, and termination and default notices shall be delivered to the following person:

Georgia Department of Transportation
Office of General Counsel
600 West Peachtree Street, Suite 2300
Atlanta, Georgia 30308
E-mail: mcline@dot.ga.gov

24.11.4 Notices shall be deemed received when actually received in the office of the addressee (or by the addressee if personally delivered) or when delivery is refused, as shown on the receipt of the U.S. Postal Service, private carrier or other Person making the delivery. Notwithstanding the foregoing, notices sent by facsimile after 12:00 p.m. Eastern Standard or Daylight Time (as applicable) and all other notices received after 12:00 p.m. shall be deemed received on the first Business Day following delivery (that is, in order for a fax to be deemed received on the same day, at least the first page of the fax must have been received before 12:00 p.m.). Any technical or other communications pertaining to the Work shall be conducted by DB Team’s Authorized Representative and technical representatives designated by GDOT.
24.12 Integration of DB Documents

GDOT and DB Team agree and expressly intend that, subject to Article 24.13, this Agreement, and other DB Documents constitute a single, non-severable, integrated agreement whose terms are interdependent and non-divisible.

24.13 Severability

24.13.1 If any clause, provision, section or part of this Agreement or the other DB Documents or any other Principal Project Document is ruled invalid (including invalid due to Change in Law) by a court having proper jurisdiction, then the Parties shall: (a) promptly meet and negotiate a substitute for such clause, provision, section, or part, which shall, to the greatest extent legally permissible, effect the original intent of the Parties; and (b) if necessary or desirable, apply to the court or other decision maker (as applicable) which declared such invalidity for an interpretation of the invalidated portion to guide the negotiations. The invalidity or unenforceability of any such clause, provision, section, or part shall not affect the validity or enforceability of the balance of the DB Documents or such other Principal Project Documents, which shall be construed and enforced as if the DB Documents or such other Principal Project Documents did not contain such invalid or unenforceable clause, provision, section, or part.

24.13.2 If after the efforts required by Article 24.13.1, the Parties mutually agree that without the section or part of the DB Documents or such other Principal Project Documents that the court ruled to be invalid, there is no interpretation or reformation of the DB Documents or such other Principal Project Documents that can reasonably be adopted which will return the Parties to the benefits of their original bargain, the Parties can mutually agree to treat the court order as a Termination by Court Ruling pursuant to Article 19.11.

24.14 Usury Savings

The DB Documents are subject to the express condition that at no time shall either Party be obligated or required to pay interest on any amount due the other Party at a rate which could subject the other Party to either civil or criminal liability as a result of being in excess of the maximum non-usurious interest rate permitted by Georgia Law (the “maximum legal rate”), if any. If, by the terms of the DB Documents either Party at any time is obligated to pay interest on any amount due in excess of the maximum legal rate, then such interest shall be deemed to be immediately reduced to the maximum legal rate and all previous payments in excess of the maximum legal rate shall be deemed to have been payments in reduction of the principal amount due and not on account of the interest due. All sums paid or agreed to be paid to a Party for the use, forbearance, or detention of the sums due that Party under the DB Documents shall, to the extent permitted by applicable Georgia Law, be amortized, prorated, allocated, and spread throughout the full period over which the interest accrues until payment in full so that the rate or amount of interest on account of the amount due does not exceed the maximum legal rate in effect from time to time during such period. If after the foregoing adjustments a Party still holds interest payments in excess of the maximum legal rate, it shall promptly refund the excess to the other Party.
24.15 Reserved

24.16 Entire Agreement

This Agreement and the other DB Documents contain the entire understanding of the Parties with respect to the subject matter thereof and supersede all prior agreements, understandings, statements, representations and negotiations between the Parties with respect to their subject matter.

24.17 Counterparts

This instrument may be executed in two or more counterparts, each of which shall be deemed an original, but all of which together shall constitute one and the same instrument.

<table>
<thead>
<tr>
<th>CONTRACT IDENTIFICATION NUMBER</th>
<th>DATE CONTRACT EXECUTED</th>
</tr>
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<tbody>
<tr>
<td>B1CBA1801645-0</td>
<td>Date 1/10/2019</td>
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<th>PROJECT NUMBER(S)</th>
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<td>210327</td>
<td>Richmond County</td>
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CONTRACTOR
Superior Construction Company Southeast, LLC

DESCRIPTION OF IMPROVEMENTS AND FACILITY
I-20 at Savannah River Bridge Replacements and Roadway Widening Project

CONTRACT SUM
$71,938,170.00

[Signature Page Immediately Follows]
IN WITNESS WHEREOF, the Parties, intending to be legally bound, have executed this Agreement, including the requirements of the DB Documents, as of the date first above written.

Superior Construction Company Southeast, LLC

By: ____________________________
Name: Peter Kelley
Title: President

GEORGIA DEPARTMENT OF TRANSPORTATION

By: ____________________________
Name: Russell R. McMurry, P.E.
Title: Commissioner

By: ____________________________
Name: Angela O. Whitworth
Title: Treasurer
EXHIBIT 1

ABBREVIATIONS AND DEFINITIONS

Unless otherwise specified, wherever the following abbreviations or terms are used in this Agreement and the Technical Provisions, they have the meanings set forth below:

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>AASHTO</td>
<td>American Association of State Highway and Transportation Officials</td>
</tr>
<tr>
<td>ADA</td>
<td>Americans with Disabilities Act</td>
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<td>AGC</td>
<td>Associated General Contractors of America</td>
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<td>AMRL</td>
<td>AASHTO Materials Reference Laboratory</td>
</tr>
<tr>
<td>ANSI</td>
<td>American National Standards Institute</td>
</tr>
<tr>
<td>APE</td>
<td>Area of Potential Effects</td>
</tr>
<tr>
<td>ARC</td>
<td>Atlanta Regional Commission</td>
</tr>
<tr>
<td>AREMA</td>
<td>American Railway Engineering and Maintenance of Way Association</td>
</tr>
<tr>
<td>ASTM</td>
<td>American Society of Testing and Materials</td>
</tr>
<tr>
<td>ATC</td>
<td>Alternative Technical Concept</td>
</tr>
<tr>
<td>BFI</td>
<td>Bridge Foundation Investigation</td>
</tr>
<tr>
<td>AWS</td>
<td>American Welders Society</td>
</tr>
<tr>
<td>BMP</td>
<td>Best Management Practice</td>
</tr>
<tr>
<td>CAD</td>
<td>Computer Aided Design</td>
</tr>
<tr>
<td>CAPWAP</td>
<td>Case Pile Wave Analysis program</td>
</tr>
<tr>
<td>CCTV</td>
<td>Closed Circuit Television</td>
</tr>
<tr>
<td>CE</td>
<td>Categorical Exclusion</td>
</tr>
<tr>
<td>CEI</td>
<td>Construction Engineering and Inspection</td>
</tr>
<tr>
<td>CEPP</td>
<td>Comprehensive Environmental Protection Program</td>
</tr>
<tr>
<td>CFR</td>
<td>Code of Federal Regulations</td>
</tr>
<tr>
<td>CIA</td>
<td>Contract Item Agreement</td>
</tr>
<tr>
<td>CMS</td>
<td>Changeable Message Sign</td>
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<tr>
<td>CPI</td>
<td>Consumer Price Index</td>
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<tr>
<td>CQAM</td>
<td>Construction Quality Assurance Manager</td>
</tr>
<tr>
<td>CQMP</td>
<td>Construction Quality Management Plan</td>
</tr>
<tr>
<td>CSJ</td>
<td>Control Section Job</td>
</tr>
<tr>
<td>CWA</td>
<td>Clean Water Act</td>
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<tr>
<td>DB</td>
<td>Design-Build</td>
</tr>
<tr>
<td>DBA</td>
<td>Design-Build Agreement</td>
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<tr>
<td>DBE</td>
<td>Disadvantaged Business Enterprise, as set forth in 49 CFR Part 26</td>
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<tr>
<td>DEIS</td>
<td>Draft Environmental Impact Statement</td>
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<tr>
<td>DMS</td>
<td>Dynamic Message Signs</td>
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<tr>
<td>DNR</td>
<td>Georgia Department of Natural Resources</td>
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<tr>
<td>DQAM</td>
<td>Design Quality Assurance Manager</td>
</tr>
<tr>
<td>DQMP</td>
<td>Design Quality Management Plan</td>
</tr>
<tr>
<td>Acronym</td>
<td>Definition</td>
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<tr>
<td>DSS</td>
<td>Decent, Safe and Sanitary</td>
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<tr>
<td>EA</td>
<td>Environmental Assessment</td>
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<tr>
<td>ECM</td>
<td>Environmental Compliance Manager</td>
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<tr>
<td>EDG</td>
<td>GDOT Electronic Data Guidelines</td>
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<tr>
<td>EP</td>
<td>Extraction Procedure (toxicity)</td>
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<td>EPA</td>
<td>Environmental Protection Agency</td>
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<tr>
<td>EPD</td>
<td>Georgia Department of Natural Resources, Environmental Protection Division</td>
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<tr>
<td>EPIC</td>
<td>Environmental Permits Issues and Commitments</td>
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<tr>
<td>ESA</td>
<td>Endangered Species Act of 1973, 16 U.S.C. §§ 1531 et seq., as amended from time to time</td>
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<tr>
<td>EUC</td>
<td>Emergency Utility Coordinator</td>
</tr>
<tr>
<td>FAA</td>
<td>Federal Aviation Administration</td>
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<tr>
<td>FAPG</td>
<td>Federal-Aid Policy Guide</td>
</tr>
<tr>
<td>FEMA</td>
<td>Federal Emergency Management Agency</td>
</tr>
<tr>
<td>FHWA</td>
<td>U.S. Federal Highway Administration</td>
</tr>
<tr>
<td>FEIS</td>
<td>Final Environmental Impact Statement</td>
</tr>
<tr>
<td>FONSI</td>
<td>Finding of No Significant Impact</td>
</tr>
<tr>
<td>FTP</td>
<td>File Transfer Protocol</td>
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<tr>
<td>FWCA</td>
<td>Fish and Wildlife Coordination Act, 16 U.S.C. §§661 et seq., as amended from time to time</td>
</tr>
<tr>
<td>GDOT</td>
<td>Georgia Department of Transportation</td>
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<tr>
<td>GEPA</td>
<td>Georgia Environmental Policy Act, Section 12-16-1, et seq. of the Official Code of Georgia Annotated</td>
</tr>
<tr>
<td>GIS</td>
<td>Geographical Information System</td>
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<tr>
<td>HEC-FFA</td>
<td>Hydraulic Engineering Circular – Flood Frequency Analysis</td>
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<td>HCR</td>
<td>Highway Conditions Report</td>
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<td>IA</td>
<td>Independent Assurance</td>
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<tr>
<td>ICD</td>
<td>Interface Control Document</td>
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<tr>
<td>ID</td>
<td>Form of Identification</td>
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<tr>
<td>IH</td>
<td>Interstate Highway</td>
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<tr>
<td>IRI</td>
<td>International Roughness Index</td>
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<tr>
<td>ISO</td>
<td>International Organization for Standardization</td>
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<tr>
<td>ITS</td>
<td>Intelligent Transportation System</td>
</tr>
<tr>
<td>IVHS</td>
<td>Intelligent Vehicle Highway System</td>
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<tr>
<td>IWP</td>
<td>Investigative Work Plan</td>
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<tr>
<td>MDS</td>
<td>Microwave Detection System</td>
</tr>
<tr>
<td>MMIP</td>
<td>Major Mobility Investment Program</td>
</tr>
<tr>
<td>MOA</td>
<td>Memorandum of Agreement</td>
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<tr>
<td>MOT</td>
<td>Maintenance of Traffic</td>
</tr>
<tr>
<td>MOU</td>
<td>Memorandum of Understanding</td>
</tr>
<tr>
<td>MPH</td>
<td>Miles Per Hour</td>
</tr>
</tbody>
</table>
QC  Quality Control
QMP  Quality Management Plan
RCP  Reinforced Concrete Pipe
RFC  Release for Construction
RFI  Request for Information
RFQ  Request for Qualifications
RFP  Request for Proposals
RLM  Residual Life Methodology
ROD  Record of Decision
ROW  Right of Way
ROW AM  Right of Way Acquisition Manager
ROWIS  Right of Way Information System
RTF  Related Transportation Facilities
SCDOT  South Carolina Department of Transportation
SDPP  Special Deposit and Possession Procedure
SDEIS  Supplemental Draft Environmental Impact Statement
SH  State Highway
SHPO  State Historic Preservation Officer
SME  Subject Matter Expert
SOQ  Statement of Qualifications
SOV  Schedule of Values
SSTR  Single Slope Traffic Railing
STA  State Transportation Agency
SUA  Standard Utility Agreement
SUE  Subsurface Utility Engineering
TCLP  Toxicity Characteristic Leaching Procedure
TIR  Traffic Interruption Request
TMC  Traffic Management Center
TMP  Transportation Management Plan
UAM  Utility Accommodation Manual
UAT  Utility Adjustment Team
UCS  User Classification Subsystem
UDC  Utility Design Coordinator
UJUA  Utility Joint Use Acknowledgment or Utility Joint Use Agreement
UM  Utility Manager
US  United States Highway
USACE  United States Army Corps of Engineers
U.S. DOT  United States Department of Transportation
USFWS  United States Fish and Wildlife Service
U.S. GAAP  U.S. Generally Accepted Accounting Principles
USPAP  Uniform Standard of Professional Appraisal Practices
<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>UST</td>
<td>Underground Storage Tank</td>
</tr>
<tr>
<td>UTM</td>
<td>Universal Transverse Mercator</td>
</tr>
<tr>
<td>VDS</td>
<td>Video Detection System</td>
</tr>
<tr>
<td>VES</td>
<td>Video Exception Sub-system</td>
</tr>
<tr>
<td>WBS</td>
<td>Work Breakdown Structure</td>
</tr>
<tr>
<td>WFI</td>
<td>Wall Foundation Investigation</td>
</tr>
<tr>
<td>WECS</td>
<td>Worksite Erosion Control Supervisor</td>
</tr>
<tr>
<td>WTCS</td>
<td>Worksite Traffic Control Supervisor</td>
</tr>
<tr>
<td>WUCS</td>
<td>Worksite Utility Coordination Supervisor</td>
</tr>
</tbody>
</table>
Abandonment means that Design-Build Team abandons all or a material part of the Project, which abandonment shall have occurred if (a) Design-Build Team demonstrates through acts or omissions an intent not to continue, for any reason other than a Relief Event that materially interferes with ability to continue, to construct or operate all or a material part of the Project and (b) no significant Work (taking into account the Project Schedule, if applicable, and any Relief Event) on the Project or a material part thereof is performed for a continuous period of more than forty five (45) days.

Addenda/Addendum/Amendment means supplemental additions, deletions, and modifications to the provisions of the RFP after the release of the draft RFP.

Adjust means to perform a Utility Adjustment.

Adjustment means a Utility Adjustment.

Adjustment Standards means the standard specifications, standards of practice, and construction methods that a Utility Owner customarily applies to facilities (comparable to those being Adjusted on account of the Project) constructed by the Utility Owner (or for the Utility Owner by its contractors), at its own expense. Unless the context requires otherwise, references in the DB Documents to a Utility Owner’s “applicable Adjustment Standards” refer to those that are applicable pursuant to Article 7.5.3 of the Agreement.

Administrative Information Submittals means those submittals Proposers are required to submit with their respective Proposal.

Affidavit of Property Interest means the form of documentation of Existing Utility Property Interests described in Section 6.2.2 of the Technical Provisions.

Affiliate means:

(a) any shareholder, member, partner or joint venture member of Design-Build Team,

(b) any Person which directly or indirectly through one or more intermediaries controls, or is controlled by, or is under common control with, Design-Build Team or any of its shareholders, members, partners or joint venture members; and

(c) any Person for which ten percent (10%) or more of the equity interest in such Person is held directly or indirectly, beneficially or of record by (i) Design-Build Team, (ii) any of Design-Build Team’s shareholders, members, partners or joint venture members or (iii) any Affiliate of Design-Build Team under clause (b) of this definition.

For purposes of this definition the term "control" means the possession, directly or indirectly, of the power to cause the direction of the management of a Person, whether through voting securities, by contract, family relationship or otherwise.

Age means the elapsed time since an Element was first constructed or installed or, if applicable, last reconstructed, rehabilitated, restored, renewed or replaced.

Agreement, DBA, Design-Build Agreement, or DB Agreement means this certain Design-Build Agreement executed by GDOT and Design-Build Team, including any and all exhibits, attachments, riders, and amendments thereto.
**Alternative Technical Concept (ATC)** means an alternative technical concept proposed by Design-Build Team pursuant to the terms set forth in the RFP.

**Apparent Successful Proposer** means the Proposer with the apparent Successful Proposal, taking into consideration the evaluation criteria and procedures.

**Area of Potential Effects (APE)** means the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of Historic Properties, if such properties exist.

**Attorney General** means the Attorney General of the State of Georgia.

**Authorized Representative** has the meaning set forth in Article 24.6.1 of the Agreement, and shall be applicable person(s) and/or party(ies) authorized to act on behalf of GDOT and the Design-Build Team respectively, as initially set forth pursuant to Exhibit 22 of the Agreement. All notices, deliveries, responses, approvals, and other communications among GDOT and/or the Design-Build Team shall be directed to the respective Authorized Representative for each of the aforementioned, unless expressly provided to the contrary in this Agreement.


**Best Value Proposal** means the Proposal meeting the standards set by the RFP that GDOT determines, through the evaluation process and evaluation criteria described in this ITP, to present the best value and to be in the best interest of GDOT and the State.

**Betterment** has, with respect to a given Utility being Adjusted, the meaning (if any) set forth in the Utility Agreement(s) applicable to the Utility; in all other cases, “Betterment” means any upgrading of the Utility in the course of such Utility Adjustment that is not attributable to the construction of the Project and is made solely for the benefit of and at the election of the Utility Owner, including an increase in the capacity, capability, efficiency or function of an Adjusted Utility over that which was provided by the existing Utility. Notwithstanding the foregoing, the following are not considered Betterments unless otherwise provided in the applicable Utility Agreement(s):

(a) any upgrading which is required for accommodation of the Project;
(b) replacement devices or materials that are of equivalent standards although not identical;
(c) replacement of devices or materials no longer regularly manufactured with an equivalent or next higher grade or size;
(d) any upgrading required by applicable Law;
(e) replacement devices or materials that are used for reasons of economy (e.g., non-stocked items may be uneconomical to purchase); and
(f) any upgrading required by the Utility Owner’s applicable Adjustment Standards.
With respect to any Replacement Utility Property Interest, “Betterment” has the meaning (if any) set forth in the applicable Utility Agreement(s). In all other cases, a Replacement Utility Property Interest shall be considered a Betterment, except to the extent that reinstallation of a Utility in the Replacement Utility Property Interest (i) is necessary in order to meet the requirements of the DB Documents, or (ii) is called for by Design-Build Team in the interest of overall economy for the Project.

**Business Day, work day, or working day** means any Calendar Day less Saturday, Sunday and State of Georgia holidays.

**Calendar Day** means any day shown on the calendar, beginning and ending at midnight.

**Change in Law** means (a) the adoption of any Law after the date that is ninety (90) days prior to the Proposal Due Date, or (b) any change, amendment to, repeal or revocation of any Law or in the interpretation or application thereof by any Governmental Entity after the date that is ninety (90) days prior to the Proposal Due Date, in each case that is materially inconsistent with Laws in effect ninety (90) days prior to the Proposal Due Date; excluding, however, any such Change in or new Law that also constitutes or causes a change in or new Adjustment Standards, as well as any change in or new Law passed or adopted but not yet effective as of the date that is ninety (90) days prior to the Proposal Due Date.

**Change of Control** means any assignment, sale, financing, grant of security interest, transfer of interest or other transaction of any type or description, including by or through voting securities, asset transfer, contract, merger, acquisition, succession, dissolution, liquidation or otherwise, that results, directly or indirectly, in a change in possession of the power to direct or control or cause the direction or control of the management of Design-Build Team or a material aspect of its business. A change in the power to direct or control or cause the direction or control of a shareholder, member, partner or joint venture member of Design-Build Team may constitute a Change of Control of Design-Build Team if such shareholder, member, partner or joint venture member possesses the power to direct or control the management of Design-Build Team. Notwithstanding the foregoing, the following shall not constitute a Change of Control:

(a) A change in possession of the power to direct or control the management of Design-Build Team or a material aspect of its business due solely to a bona fide open market transaction(s) in securities effected on a recognized public stock exchange, including such transactions involving an initial public offering;

(b) A change in possession of the power to direct or control the management of Design-Build Team or a material aspect of its business due solely to a bona fide transaction involving beneficial interests in the ultimate parent organization of a shareholder, member, partner or joint venture member of Design-Build Team, (but not if the shareholder, member, partner or joint venture member is the ultimate parent organization), unless the transferee in such transaction is at the time of the transaction suspended or debarred or subject to a proceeding to suspend or debar from bidding, proposing or contracting with any federal or State department or agency;

(c) An upstream reorganization or transfer of direct or indirect interests in Design-Build Team so long as there occurs no change in the entity with ultimate power to direct or control or cause the direction or control of the management of Design-Build Team;
(d) A transfer of interests between managed funds that are under common ownership or control other than a change in the management or control of a fund that manages or controls Design-Build Team;

(e) The exercise of minority veto or voting rights (whether provided by applicable Law, by Design-Build Team’s organizational documents or by related member or shareholder agreements or similar agreements) over major business decisions of Design-Build Team, provided that if such minority veto or voting rights are provided by shareholder or similar agreements, GDOT has received copies of such agreements; or

**Change Order** means a written approval by GDOT, counter-signed by Design-Build Team, with respect to a GDOT Change or Change Request, which shall set forth any adjustments to the DB Contract Sum and/or the Contract Time, including on account of a Relief Event or Compensation Event, as provided in the Agreement.

**Change Request** means a written request from Design-Build Team seeking to change the character, quantity, quality, description, scope or location of any part of the Work, to modify the DB Documents.

**Chief Executive Officer of the Design-Build Team** means the chief executive officer, president or other senior officer of the Design-Build Team, or the governing body of Design-Build Team, in each case having authority to negotiate and resolve a Dispute with the Commissioner and bind Design-Build Team by his or her decision in regard to such Dispute.

**Claimant** means any Person that would be entitled to protection of payment bond under Code Section 13-10-63, including any P&P Bonds.

**Code** has the meaning set forth in Recital C of the Agreement.

**Commissioner** means the Commissioner of GDOT appointed by the State Transportation Board and any successor thereto having substantially similar powers and authority.

**Communications Plan** has the meaning set forth in Section 2.7 of the Technical Provisions.

**Comparable Limited Access Highways** means Highways that have full control of access, are divided, have grade separations at intersections and are in other respects substantially similar to the Project and associated facilities, as applicable. For purposes of this definition, determination of what portions of the Limited Access Highway system are substantially similar to the Project shall be based on any one or more of similar age, design, engineering, construction, topographical features, operating systems and features, or other features or situations, and/or based on a geographical area in which Highways have been or are susceptible to being affected by a common event (such as but not limited to hurricane or tornado). The presence or absence of tolling and tolling facilities shall not be a factor in determining whether a Highway is substantially similar to the Project.

**Compensation Amount** means the amount of compensation to be paid to Design-Build Team for a Compensation Event as set forth and subject to the limitations of the Agreement, including Article 14.2 therein.
Compensation Event means the written notice submitted by Design-Build Team in accordance with Article 14.2 of the Agreement.

Compensation Event Notice means the written notice submitted by Design-Build Team in accordance with Article 13.3.2 of the Agreement.

Completion Date means the date the Design-Build Team has satisfied all conditions and requirements of and for a Completion Deadline, including Interim Completion Deadlines, the Substantial Completion Deadline, and Final Acceptance, as may be adjusted pursuant to any Supplemental Agreement, including on account of any Relief Events.

Completion Deadline means the critical milestones for commencement or completion of the Work as set forth in Exhibit 9 to the Agreement, including without limitation Interim Completion Deadlines, the Substantial Completion Deadline, and Final Acceptance Deadline, as may be adjusted upon approval of the Project Baseline Schedule as set forth in Article 3.2 of the Agreement, and as further adjusted pursuant to any Supplemental Agreement, including on account of any Relief Events.

Conceptual Layout Plan means the schematic layout which provides alignment and lane configuration information necessary to verify lane continuity and general scope compliance for the entire Project.

Construction Commencement Date means for the date on which Design-Build Team first commences construction of the Project or such relative phase thereof.

Construction Documents means all shop drawings, working drawings, fabrication plans, material and hardware descriptions, specifications, construction quality control reports, construction quality assurance reports and samples necessary or desirable for construction of the Project and/or the Utility Adjustments included in the Construction Work, in accordance with the DB Documents.

Construction Maintenance Limits Plan means the deliverable to identify the physical boundaries of Design-Build Team’s maintenance responsibilities for the Construction Work.

Construction Phase has the meaning set forth in Section 2.2.5 of the Technical Provisions.

Construction Phasing Plan has the meaning set forth in Section 2.2.5 of the Technical Provisions.

Construction Quality Assurance Firm (CQAF) is a firm hired by the Lead Contractor to perform construction inspection, testing and sampling as further defined in Section 2.3.9 and Attachment 2-1 of Volume 3. The CQAF and DB Team shall follow the Construction Quality Assurance Program (CQAP) in Attachment 2-2 of Volume 3.

Construction Quality Assurance Program (CQAP) has the meaning set forth in Attachment 2-2 of Volume 3.

Construction Work means all portions of the Work necessary to build or construct, make, form, manufacture, furnish, install, supply, deliver or equip the Project and/or the Utility Adjustments. Construction Work includes landscaping.
Contract means any agreement, and any supplement or amendment thereto, by either (a) Design-Build Team with any other Person or Contractor, or (b) any Contractor with any Person or Subcontractor, to perform any part of the Work or provide any materials, equipment or supplies for any part of the Work, or any such agreement, supplement or amendment at a lower tier, between a Subcontractor and its lower tier sub-subcontractor or supplier. The term "Contract" excludes Utility Agreements and any agreement with GDOT.

Contract Item Agreement (CIA) means an Agreement used for including Utility work in the Department’s project and performed by the Department’s Contractor awarded by competitive bid.

Contract Sum means the lump sum amount identified in the Agreement (preceding signatures under Article 24).

Contract Time means the time period provided for Design-Build Team’s completion of the Work as provided in Article 3.3.1 of the Agreement.

Contractor means any Person, including any Subcontractor with whom Design-Build Team has entered into any Contract to perform any part of the Work or provide any materials, equipment or supplies for the Project and/or the Utility Adjustments included in the Construction Work, on behalf of Design-Build Team. The term “Contractor” excludes GDOT.

Cost to Cure means an appraisal method applied to estimate a proper adjustment for damages to a property that can be physically and economically corrected, as described in further detail in the GDOT ROW Manual.

Critical Path means the sequence of activities that must be completed on schedule for the entire Project to be completed on in accordance with the Milestone Deadlines. This is the longest duration path through the work plan, in terms of time, of logically connected activities on the Project Baseline Schedule ending with the relative Milestone Deadline in respect thereof.

Customer Groups means groups, Persons and entities having a perceived stake or interest in the Project, including: the media, elected officials, Governmental Entities, general public residing or working within the general vicinity of the Project or traveling within or across the limits of the Project, business owners within or adjacent to the Project corridor, Utility Owners, railroads, transportation authorities and providers, community groups, local groups (neighborhood associations, business groups, chambers of commerce, convention and visitors bureaus, contractors, etc.) and other Persons or entities affected by the Project, including those identified in Section 3.2 of the Technical Provisions.

Day or day means calendar day unless otherwise expressly specified.

DBE Performance Plan means Design-Build Team’s plan for meeting the Disadvantaged Business Enterprises (DBE) participation goals set forth in Article 10.9.2 of the Agreement. The DBE Performance Plan is Exhibit 14 to the Agreement.

Decent, Safe and Sanitary (DSS) means the condition of a dwelling such that it meets applicable housing and occupancy codes.

Default Interest Rate means the statutory interest rate applicable to GDOT for contract payment defaults.
**Default Termination Event** means each of the Design-Build Team Defaults listed in Article 19.3.1 of the Agreement.

**Defect** means any Work that does not otherwise conform with the DB Documents, or otherwise is a defect, whether by design, construction, installation, affecting the condition, use, functionality or operation of any portion of the Work which, ordinary wear and tear excepted, would cause or have the potential to cause one or more of the following:

(a) a hazard, nuisance or other risk to public or worker health or safety, including the health and safety of Users;

(b) a structural deterioration of the affected Element or any other part of the Project;

(c) damage to a third party's property or equipment;

(d) damage to the Environment;

(e) failure of the affected Element or any other part of the Project to meet a Performance Requirement; or

(f) failure of an Element to meet the Target for a measurement record as set forth in the columns headed “Target” and “Measurement Record” in the Performance and Measurement Table Baseline.

**Design-Build Agreement, DB Agreement, DBA** - see definition for Agreement.

**Design-Build Contract Sum** or **DB Contract Sum** means the total contract sum to be paid to Design-Build Team on account of the fully and properly performed Work as set forth in the Agreement, as adjusted pursuant to Supplemental Agreements (including to reflect adjustments for Compensation Events or Change Orders as provided in the Agreement), including without limitation all of Design-Build Team’s profit, fees, financing costs and interest expense for Design-Build Team Debt, all costs of work and services, materials, equipment, supplies, general conditions costs, overhead and administrative expenses, professional fees and subconsultant costs, acquisition and other costs associated with acquisition of any Approved Properties, insurance and bond premiums, sales taxes, assessments, tariffs, permit, license and registration fees, and all other related costs and expenses.

**Design-Build Documents** or **DB Documents** means those documents as set forth in Article 1.2 of the Agreement and all such other agreements entered into by GDOT and Design-Build Team or any Design-Build Team-Related Entity, or otherwise executed by Design-Build Team or a Design-Build Team-Related Entity and delivered to GDOT, with respect to or in connection with this Agreement, including without limitation Supplemental Agreements.

**Design-Build Period** means the period commencing with NTP 1 and ending when Design-Build Team achieves Final Acceptance.

**Design-Build Team** or **DB Team** means the party identified as such in the opening paragraph of this Agreement, together with its permitted successors and assigns.

**Design-Build Team Default** or **DB Team Default** has the meaning set forth in Article 17.1.1 of the Agreement.
Design-Build Team's Interest or DB Team’s Interest means all right, title, and interest of Design-Build Team in, to, under or derived from the Agreement and the other DB Documents.

Design-Build Team Proposed/ Design-Build Team Acquired Right of Way means Additional Properties; see Section 7 of the Technical Provisions.

Design-Build Team-Related Entities or DB Team-Related Entities means (a) Design-Build Team, (b) Design-Build Team’s shareholders, partners, joint venture members and/or members, (c) the Contractor and all other Subcontractors (including Suppliers), (d) any other Persons performing any of the Work, (e) any other Persons for whom Design-Build Team may be legally or contractually responsible, and (f) the employees, agents, officers, directors, shareholders, representatives, consultants, successors and assign of any of the foregoing; provided, however, that GDOT shall not be considered Design-Build Team-Related Entities.

Design-Build Team Release(s) of Hazardous Material or DB Team Release(s) of Hazardous Material means (a) Release(s) of Hazardous Material, or the exacerbation of any such release(s), attributable to the culpable actions, culpable omissions, negligence, willful misconduct, or breach of applicable Law or contract by any Design-Build Team-Related Entity; (b) Release(s) of Hazardous Materials arranged to be brought onto the Site or elsewhere by any Design-Build Team-Related Entity; regardless of cause, or (c) use, containment, storage, management, handling, transport and disposal of any Hazardous Materials by any Design-Build Team-Related Entity in violation of the requirements of the DB Documents or any applicable Law or Governmental Approval.

Design-Build Team Vehicle or DB Team Vehicle means any vehicle authorized by Design-Build Team performing construction, maintenance or operation of the Project, or other related activity.

Design Deviation means any deviation from criteria defined in the GDOT Design Policy Manual as a “guideline”. Failure to adhere to the “10 Controlling Criteria” mandated by FHWA and/or the GDOT Standard Design Criteria mandated by GDOT does not qualify as a Design Deviation.

Design Documents means all drawings (including plans, profiles, cross-sections, notes, elevations, typical sections, details and diagrams), specifications, reports, studies, calculations, electronic files, records and submittals necessary for, or related to, the design of the Project and/or the Utility Adjustments included in the Design Work and/or the Construction Work.

Design Speed means the speed used to determine the various geometric design features of the roadway.

Design Submittal Guide shall have the meaning set forth in Section 2.2.5 of the Technical Provisions.

Design Work means all Work of design, engineering or architecture for the Project or Utility Adjustments.

Deviation means any proposed or actual change, deviation, modification, alteration or exception from this Agreement, the Technical Provisions, Technical Documents or Governmental Approvals.
Directive Letter means the letter described in Article 13.1 of the Agreement.

Disadvantaged Business Enterprise or DBE has the meaning set forth 49 CFR 23 and further described in Attachment 6 to Exhibit 8 to the Agreement.

Discipline Groups has the meaning set forth in Section 3.6.10 of the Technical Provisions.

Discriminatory or Discriminatory Action means (a) materially more onerous application to Design-Build Team or the Project of changes or additions to Technical Provisions or Technical Documents than the application thereof to other Comparable Limited Access Highways, or (b) selective application of changes or additions to Technical Provisions or Technical Documents to Design-Build Team or the Project and not to other Comparable Limited Access Highways. Notwithstanding the foregoing, the following actions are not Discriminatory or Discriminatory Actions: (i) any such application in response to any act or omission by or on behalf of Design-Build Team in violation of Law or the DB Documents; (ii) Safety Compliance; (iii) any such application in response to a directive by the U.S. Department of Homeland Security or comparable State agency, unless such directive is directed solely at or solely affects the Project and such application requires specific changes in Design-Build Team’s normal design, construction, operation or maintenance procedures in order to comply; and (iv) any other actions necessary to address potential safety concerns arising from a specific condition or feature peculiar to the Project.

Dispute means any claim, dispute, disagreement or controversy between GDOT and Design-Build Team concerning their respective rights and obligations under the DB Documents, including concerning any alleged breach or failure to perform and remedies.

Dispute Resolution Procedures means the procedures for resolving Disputes set forth in Article 17.7 of the Agreement.

Early Adjustment means a Utility identified as such in Section 6 of the Volume 2.

Early Portions of the Work means those usable portions of the Project, which should be opened so that they are contiguous; each of which must be completed within the Interim Completion Deadline identified in Exhibit 9 to the Agreement.

Early Termination Date means the effective date of termination of the Agreement for any reason prior to the stated expiration Final Acceptance Deadline, as specified in the relevant provisions of Article 19.

Effective Date means the date of the Agreement or such other date as shall be mutually agreed upon in writing by GDOT and Design-Build Team.

Element means an individual component, system or subsystem of the Work.

Emergency means an unforeseen event affecting the Project whether directly or indirectly which (a) causes or has the potential to cause disruption to the free flow of traffic on the Project or a threat to the safety of the public; (b) is an immediate or imminent threat to the long term integrity of any part of the infrastructure of the Project, to the Environment, to property adjacent to the Project or to the safety of Users or the traveling public; or (c) is recognized by the Georgia Department of Public Safety as an emergency.
**Engineer of Record** means a Professional Engineer as defined in this Exhibit 1, on the Design-Build Team who is responsible and liable for the adequacy and safety of the design. This individual will sign and seal the Released for Construction plans, as well as revisions on construction and shop drawings.

**Environment** means air, soils, surface waters, groundwater, land, stream sediments, surface or subsurface strata, biological resources, including endangered, threatened and sensitive species, natural systems, including ecosystems, and historic, archeological and paleontological resources.

**Environmental Approvals (also Environmental Document Approvals)** means all Governmental Approvals arising from or required by any Environmental Law in connection with development of the Project, including approvals and permits required under NEPA/GEPA.

**Environmental Commitment (also Environmental Permits, Issues and Commitments)** means an environmental requirement that must be fulfilled before, during or after construction. Environmental Commitments include commitments to avoid impacts in specified areas, complete environmental investigations before construction impacts, or to perform specified actions after completion of construction.

**Environmental Documents** means all required documents and submittals pertaining to either federal or state laws and permits which are necessary to complete the Project. This may include but not be limited to NEPA, GEPA, and/or other state and federal environmental laws.

**Environmental Law** means any Law applicable to the Project or the Work regulating or imposing liability or standards of conduct that pertains to the Environment, Hazardous Materials, contamination of any type whatsoever, or environmental health and safety matters, and any lawful requirements and standards that pertain to the Environment, Hazardous Materials, contamination of any type whatsoever, or environmental health and safety matters, set forth in any permits, licenses, approvals, plans, rules, regulations or ordinances adopted, or other criteria and guidelines promulgated, pursuant to Laws applicable to the Project or the Work, as such have been or are amended, modified, or supplemented from time to time (including any present and future amendments thereto and reauthorizations thereof) including those relating to:

(a) The manufacture, processing, use, distribution, existence, treatment, storage, disposal, generation, and transportation of Hazardous Materials;

(b) Air, soil, surface and subsurface strata, stream sediments, surface water, and groundwater;

(c) Releases of Hazardous Materials;

(d) Protection of wildlife, Threatened or Endangered Species, sensitive species, wetlands, water courses and water bodies, historical, archeological, and paleontological resources, vegetative buffers, and natural resources;

(e) The operation and closure of underground storage tanks;

(f) and safety of employees and other persons; and
(g) Notification, documentation, and record keeping requirements relating to the foregoing.

Without limiting the above, the term “Environmental Laws” shall also include the following:

(i) The National Environmental Policy Act (42 U.S.C. §§ 4321 et seq.), as amended;

(ii) The Georgia Environmental Policy Act (Section 12-16-1, et seq. of the Official Code of Georgia Annotated), as amended;

(iii) State species laws, including Georgia Endangered Wildlife Act and/or, Georgia Wildflower Preservation Act;


(v) The Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act (42 U.S.C. §§ 6901 et seq.);


(vii) The Clean Air Act (42 U.S.C. §§ 7401 et seq.), as amended;

(viii) The Federal Water Pollution Control Act, as amended by the Clean Water Act (33 U.S.C. §§ 1251 et seq.);


(xii) The Oil Pollution Act (33 U.S.C. §§ 2701, et seq.), as amended;


(xv) The Federal Radon and Indoor Air Quality Research Act (42 U.S.C. §§ 7401 et seq.), as amended;

(xvi) The Occupational Safety and Health Act (29 U.S.C. §§ 651 et seq.);


(xviii) The Fish and Wildlife Coordination Act (16 U.S.C. §§ 661 et seq.), as amended;

(xx) The Coastal Zone Management Act (33 U.S.C. §§ 1451 et seq.), as amended;

(xxi) Georgia Water Quality Act (O.C.G.A. § 12-5-20);

(xxii) Georgia Erosion and Sedimentation Act (O.C.G.A. § 12-7-1), as amended;

(xxiii) Best Management Practices (O.C.G.A. § 12-7-6(b)(15)); and

(xxiv) Georgia Underground Storage Act (O.C.G.A. § 12-13-1)).

**Escrow Agent** has the meaning set forth in Exhibit 24 of the Agreement.

**Evaluation Score** means the numerical score resulting from the adjectival evaluation and numerical conversion of a particular portion of the Proposals.

**Exhibits** means all exhibits, riders, and other attachments to the DB Documents, including without limitation Volume 1, Volume 2, and Volume 3, as well as, any of the aforementioned, which are incorporated into any DB Documents by reference, and all amendments, modifications, and supplements thereto.

**Existing Improvements** means the existing highway, bridge, and related improvements as of the date that is ninety (90) days prior to the Proposal Due Date within the Construction Maintenance Limits.

**Existing Right of Way** or **Existing ROW** means any real property (which term is inclusive of all estates and interests in real property), improvements and fixtures (i) as provided in Article 2.2 of the Agreement and more specifically described and identified as “Existing ROW” within Exhibit 4, in which GDOT has a leasehold estate and interest pursuant to the Estate for Years or other property right or interest, and (ii) any Proposed Right of Way, which GDOT at any time after the Effective Date, shall acquire a leasehold estate or other property interest. The term specifically includes all air space, surface rights and subsurface rights within the limits of the Existing Right of Way.

**Existing Utility Property Interest** means any right, title or interest in real property (e.g., a fee or an easement) claimed by a Utility Owner as the source of its right to maintain an existing Utility in such real property, which is compensable in eminent domain.

**Federal Requirements** means the provisions required to be part of federal-aid construction contracts, including the provisions set forth in Exhibit 8 to the Agreement.

**Final Acceptance** means the occurrence of all the events and satisfaction of all the conditions set forth in Article 7.7.3 of the Agreement, as and when confirmed by GDOT’s issuance of a certificate in accordance with the procedures and within the timeframe established in Article 7.7.3 of the Agreement.

**Final Acceptance Date** means the date upon which Design-Build Team has satisfied all conditions of and for Final Acceptance and GDOT has certified same.

**Final Acceptance Deadline** means the deadline for achieving Final Acceptance, as set forth in the Milestone Schedule, as such deadline may be extended for any Relief Event or Change Order as and to extend provided in the Agreement.
Final Design shall have the meaning set forth in Article 3.3.1.2 of the Agreement.

Final Plans means the Design Documents which provide the complete and final documents necessary for the construction, operations, and maintenance of the Project or any portion thereof including any Utility Adjustments required by the Project.

Final ROW Lines means the final location of all Right of Way within the project limits.

Fiscal Year means the twelve (12) month fiscal year used by GDOT for budgeting purposes.

Float means the amount of time that any given activity or logically connected sequence of activities shown on the Project Schedule, as the case may be, may be delayed before it will affect completion of any Work as required to achieve any Milestone Schedule Deadline, including the Substantial Completion Deadline and Final Acceptance Deadline.

Force Majeure Event means the occurrence of any of the following events that materially and adversely affects performance of Design-Build Team's obligations, provided that such events (or the effects of such events) could not have been avoided by the exercise of caution, due diligence, or reasonable efforts by Design-Build Team: (a) war (including civil war and revolution), invasion, armed conflict, violent act of foreign enemy, military or armed blockade, or military or armed takeover of the Project, in each case occurring within the State; (b) any act of terrorism or sabotage that causes direct physical damage to the Project; (c) nuclear explosion or contamination, in each case occurring within the State; (d) riot and civil commotion on or in the immediate vicinity of the Project; (e) fire, explosion, flood, earthquake, hurricane, or tornado, in each case that causes direct physical damage to the Project; or (f) national or statewide (i.e. State of Georgia) strike that has a direct adverse impact on Design-Build Team’s ability to obtain materials, equipment or labor for the Project.

Formal Consultation means during Section 7 Consultation (Endangered Species Act) that a Federal agency determines, through a biological assessment or other review, that its action is likely to adversely affect a listed species.

GDOT means the Georgia Department of Transportation, as set forth in the recitals of the Agreement, and any entity succeeding to the powers, authorities and responsibilities of GDOT invoked by or under the DB Documents.

GDOT-Caused Delay means any of the following events, to the extent they result in a material delay or interruption in performance of any material obligation under the Agreement, and provided such events are beyond Design-Build Team's control and are not due to any act, omission, negligence, recklessness, willful misconduct, breach of contract or Law of any of the Design-Build Team-Related Entities, solely to the extent not concurrent or overlapping with any delay attributable to Design-Build Team, and further provided that such events (or the effects of such events) could not have been avoided by the exercise of caution, due diligence, or reasonable efforts by Design-Build Team, and with respect to any Compensation Event, solely to the extent that the cumulative effect of any such delays as set forth below have or shall result in delays, after taking into account any available Float, in excess of ninety (90) days:

(a) Failure of GDOT to issue NTP 1 as provided pursuant to Article 3.3.1.1 of the Agreement and/or failure to issue NTP 2 or NTP 3 as provided pursuant to Article 3.3.1.2 and Article 3.3.1.3 of the Agreement;
(b) GDOT Changes;

(c) Failure of GDOT to provide the GDOT-Provided Approvals within the time periods set forth in Section 4.2.2 of the Technical Provisions, subject to Article 6.2.1 of the Agreement; or

(d) Failure of GDOT to provide responses to proposed schedules, plans, Design Documents, condemnation and acquisition packages, and other Submittals and matters submitted to GDOT after the Effective Date for which response is required under the DB Documents as an express prerequisite to Design-Build Team’s right to proceed or act, within the time periods (if any) indicated in the DB Documents, or if no time period is indicated, within a reasonable time, taking into consideration the nature, importance and complexity of the submittal or matter, following delivery of written notice from Design-Build Team requesting such action in accordance with the terms and requirements of the DB Documents;

(e) Failure of GDOT to provide Design-Build Team with access to the Right of Way as required; or


Any proper suspension of Work pursuant to Article 17.3.7 of the Agreement shall not be considered a GDOT-Caused Delay.

**GDOT Change** means:

(a) Any change in the scope of the Work or terms and conditions of the Technical Provisions or Technical Documents (including changes in the standards applicable to the Work) that GDOT has directed Design-Build Team to perform through a Supplemental Agreement as described in Article 13 of the Agreement or a Directive Letter pursuant to Article 13.1 of the Agreement; and

(b) Any other event that the DB Documents expressly state shall be treated as a GDOT Change.

**GDOT Claims Account** means the designated account for the benefit of GDOT and Design-Build Team to be administered and maintained by GDOT for payments on account of claims as required by GDOT pursuant to Article 17.3.4 of the Agreement.

**GDOT Default** has the meaning set forth in Article 17.5.1 of the Agreement.

**GDOT Recoverable Costs** means:

(a) The costs of any assistance, action, activity or Work undertaken by GDOT which Design-Build Team is liable for or is to reimburse under the terms of the DB Documents, including the charges of third-party contractors, and reasonably allocated wages, salaries, compensation and overhead of GDOT staff and employees, performing such action, activity or Work (exclusive of ordinary and customary administration and review activities by GDOT employees or consultants, except for such consultant fees and expenses as expressly reserved in the Agreement); plus
(b) Third-party costs GDOT incurs to publicly procure any such third-party contractors; plus

(c) Reasonable fees and costs of attorneys (including the reasonably allocable fees and costs of the Georgia Attorney General’s Office), financial advisors, engineers, architects, insurance brokers and advisors, investigators, traffic and revenue consultants, risk management consultants, other consultants, and expert witnesses, as well as court costs and other litigation costs, in connection with any such assistance, action, activity or Work, including in connection with defending claims by and resolving disputes with third-party contractors; plus

(d) Any expense or cost for which GDOT is to be reimbursed by Design-Build Team pursuant to the express terms of the Agreement; plus

(e) Interest on all the foregoing sums at the Default Interest Rate from the date due under the applicable terms of the DB Documents and continuing until paid.

**GDOT Re-evaluation Period (Re-evaluation Period)** means the specified amount of time set forth as a condition in an approved ATC for GDOT to obtain the applicable Governmental Approval required for a re-evaluation of the NEPA/GEPA Approval, prior to Design-Build Team being entitled to a Relief Event or Compensation Event; provided, however, that such time shall commence upon the date that GDOT has received a full and complete document package from Design-Build Team required for GDOT to process such re-evaluation.

**GDOT Release(s) of Hazardous Materials** means, except as provided below, the introduction in, on or under the Construction Maintenance Limits or Operation and Maintenance Limits of Hazardous Material directly by GDOT, and their respective agents and contractors (excluding Design-Build Team). GDOT Release(s) of Hazardous Material excludes, however, (i) any Hazardous Materials so introduced that are in or part of construction materials and equipment incorporated into the Project and (ii) any Hazardous Materials identified in the phase 1 investigation and report described in clause (i) of the definition of Pre-Existing Hazardous Materials.

**GDOT Standard Specifications** means the Georgia Department of Transportation Standard Specifications, Construction of Transportation Systems.

**General Purpose Lanes** means Limited Access Highway lanes within the Existing Right of Way other than the Managed Lanes.

**Georgia Work** means that portion of the Work located within the State of Georgia.

**Geotechnical Engineering Reports** means the reports which meet the requirements described in Section 8.2 of the Technical Provisions.

**GEPA** means the Georgia Environmental Policy Act, as amended and as it may be amended from time to time.

**GEPA Approval** means the (a) GEPA document as approved by Georgia DOT including any studies, reports, Environmental Commitments, and all other procedural requirements and documents required for the Project or a portion of the Project, as (b) may be modified pursuant to all Georgia EPD, USACE, USFWS approvals, and approved supplements and re-evaluations pertaining to the Project.
Good Industry Practice means the exercise of the degree of skill, diligence, prudence and foresight which would reasonably and ordinarily be expected from time to time from a skilled and experienced designer, engineer, or constructor, seeking in good faith to comply with its contractual obligations, complying with the DB Documents, all applicable Laws and Governmental Approvals, and engaged in the same type of undertaking in the United States under similar circumstances and conditions.

Governmental Approval means any permit, license, consent, concession, grant, franchise, authorization, waiver, variance or other approval, guidance, protocol, mitigation agreement, special provision, or memoranda of agreement/understanding, and any amendment or modification of any of them provided by Governmental Entities including State, local, or federal regulatory agencies, agents, or employees, which authorize or pertain to the Project or the Work.

Governmental Entity means any federal, State or local government and any political subdivision or any governmental, quasi-governmental, judicial, public or statutory instrumentality, administrative agency, authority, body or entity other than GDOT.

Guarantor means any Person that is the obligor under any guarantee in favor of GDOT required under the Agreement, including any Design-Build Guaranty.

Hazardous Materials means any element, chemical, compound, material or substance, whether solid, liquid or gaseous, which at any time is defined, listed, classified or otherwise regulated in any way under any Environmental Laws, or any other such substances or conditions (including mold and other mycotoxins or fungi) which may create any unsafe or hazardous condition or pose any threat to human health and safety. “Hazardous Materials” includes the following:

(a) Hazardous wastes, hazardous material, hazardous substances, hazardous constituents, and toxic substances or related materials, whether solid, liquid, or gas, including substances defined as or included in the definition of “hazardous substance”, “hazardous waste”, “hazardous material”, “extremely hazardous waste”, “acutely hazardous waste”, “radioactive waste”, “radioactive materials”, “bio-hazardous waste”, “pollutant”, “toxic pollutant”, “contaminant”, “restricted hazardous waste”, “infectious waste”, “toxic substance”, “toxic waste”, “toxic material”, or any other term or expression intended to define, list or classify substances by reason of properties harmful to health, safety or the indoor or outdoor environment (including harmful properties such as ignitability, corrosivity, reactivity, carcinogenicity, toxicity, reproductive toxicity, “TCLP” toxicity” or “EP toxicity” or words of similar import under any applicable Environmental Laws);

(b) Any petroleum, including crude oil and any fraction thereof, and including any refined petroleum product or any additive thereto or fraction thereof or other petroleum derived substance; and any waste oil or waste petroleum byproduct or fraction thereof or additive thereto;

(c) Any drilling fluids, produced waters and other wastes associated with the exploration, development or production of crude oil, natural gas or geothermal resources;

(d) Any flammable substances or explosives;

(e) Any radioactive materials;

(f) Any asbestos or asbestos-containing materials;
(g) Any lead and lead-based paint;

(h) Any radon or radon gas;

(i) Any methane gas or similar gaseous materials;

(j) Any urea formaldehyde foam insulation;

(k) Electrical equipment which contains any oil or dielectric fluid containing regulated levels of polychlorinated biphenyls;

(l) Pesticides;

(m) Any other chemical, material or substance, exposure to which is prohibited, limited or regulated by any Governmental Entity or which may or could pose a hazard to the health and safety of the owners, operators, Users or any Persons in the vicinity of the Project or to the indoor or outdoor Environment; and

(n) Soil, or surface water or ground water, contaminated with Hazardous Materials as defined above.

**Hazardous Materials Management** means procedures, practices and activities to address and comply with Environmental Laws and Environmental Approvals with respect to Hazardous Materials encountered, impacted, caused by or occurring in connection with the Project or the Work, as well as investigation and remediation of such Hazardous Materials. Hazardous Materials Management may include sampling, stock-piling, storage, backfilling in place, asphalt batching, recycling, treatment, clean-up, remediation, transportation and/or off-site disposal of Hazardous Materials, whichever approach is effective, most cost-efficient and authorized under applicable Law.

**Highway** means a travel way for vehicular traffic that is included in the State or federal highway system.

**Highway Service Systems** means GDOT’s or a Governmental Entity’s lighting and electrical systems, traffic control systems, communications systems and irrigation systems serving street or highway purposes (including ITS and Intelligent Vehicle Highway System facilities).

**Historic Property** means any prehistoric or historic district, site, building, structure or object included in, or eligible for inclusion in, either the National Register of Historic Places or the Georgia Register of Historic Places.

**Immigration Act** means the Georgia Immigration & Compliance Act, O.C.G.A. § 13-10-90, et seq. as set forth in Article 10.6.4 of the Agreement.

**Incident** means any unplanned event during the course of construction.

**Incident Management Plan** means Design-Build Team’s plan for detection and response to Incidents or Emergencies, as part of the PMP.
**Indemnified Parties** means GDOT, the State, the State Transportation Board, and their respective successors, assigns, officeholders, officers, directors, commissioners, agents, representatives, consultants and employees, the State of South Carolina, and SCDOT, any staff of SCDOT, including members of the SCDOT Commission and/or consultants supporting SCDOT. Indemnified Party shall mean any of the aforementioned.

**Informal Consultation** means during Section 7 Consultation (Endangered Species Act) that a Federal agency determines that its action may affect a listed species.

**Instructions to Proposers (ITP)** means the document that provides instructions to be followed by Proposers in their responses to the RFP.

**Insurance Policies** means all of the insurance policies Design-Build Team is required to carry pursuant to Article 16.1 of the Agreement.

**Intellectual Property** means all current and future legal and/or equitable rights and interests in know-how, patents (including applications), copyrights (including moral rights), trademarks (registered and unregistered), service marks, trade secrets, designs (registered and unregistered), utility models, circuit layouts, plant varieties, business and domain names, inventions, solutions embodied in technology, and other intellectual activity, and applications of or for any of the foregoing, subsisting in or relating to the Project, Project design data or Project traffic data. Intellectual Property includes toll-setting and traffic management algorithms, and software used in connection with the Project (including but not limited to software used for management of traffic on the Project), and Source Code. Intellectual Property also includes the trade secret information contained in proprietary pricing information. Intellectual Property is distinguished from physical construction and equipment itself and from drawings, plans, specifications, layouts, depictions, manuals and other documentation that disclose Intellectual Property.

**Intelligent Transportation System (ITS)** has the meaning set forth in Section 17 of the Technical Provisions.

**Intelligent Vehicle Highway System (IVHS)** means smart vehicle and smart highway technologies to improve the safety, efficiency and environmental impact of highway facilities.

**Interim Completion** means satisfaction of the criteria for opening an Early Portion of the Work so that it is safe to open to the traveling public.

**Interim Completion Date** means the date upon which Design-Build Team has satisfied all conditions for opening an Early Portion of the Work so that it is safe to open to the traveling public.

**Interim Completion Deadline** means the deadline and required date for each of the Early Portions of the Work, which portions are shown in Exhibit 2 to the Agreement, Interim Completion Deadlines are set forth in the Milestone Schedule shown on Exhibit 9 to the Agreement, as such deadline(s) may be extended for Relief Events pursuant to the Agreement.

**Interim Design** means any submittal of Design Documents after the Preliminary Plans have been accepted but prior to submittal of Final Plans for the entire Project or any approved Project segment. Interim Designs are intended to resolve conflicts and unresolved comments from the Preliminary Plans submittal.
Joint Project Inspection has the meaning set forth in Section 2.1.6 of the Technical Provisions.

Key Contract means any one of the following Contracts for Work that Design-Build Team or Design-Build Team’s Contractor’s causes to be performed:

(a) All prime construction Contracts;

(b) All project or program management services, architectural design, or engineering Contracts; and

(c) All other Contracts with a single Contractor or Subcontractor which individually or in the aggregate total in excess of $25 million.

Key Contractor means any Contractor or Subcontractor, as the case may be, under any Key Contract.

Key Personnel or Key Team Members means those individuals appointed by Design-Build Team and approved by GDOT from time to time to fill the “Key Personnel” positions. The specific individuals appointed by Design-Build Team and approved by GDOT to initially fill certain of the Key Personnel positions are identified in Exhibit 2 to the Agreement.

Landscape Enhancement Plan has the meaning set forth in Section 15.3.1 of the Technical Provisions.

Law or Laws means (a) any statute, law, code, regulation, ordinance, rule or common law, (b) any binding judgment (other than regarding a Dispute), (c) any binding judicial or administrative order or decree (other than regarding a Dispute), (d) any written directive, guideline, policy requirement or other governmental restriction (including those resulting from the initiative or referendum process, but excluding those by GDOT within the scope of its administration of the DB Documents or in the normal course of its adoption of new or revised technical standards pursuant to Article 7.2.5 of the Agreement) or (e) any similar form of decision or determination by, or any written interpretation or administration of any of the foregoing by, any Governmental Entity, in each case which is applicable to or has an impact on the Project or the Work, whether taking effect before or after the Effective Date, including Environmental Laws. “Laws”, however, excludes Governmental Approvals.

Lead Contractor shall mean the entity designated as a Proposer’s “Lead Contractor” in its SOQ. There may only be one Lead Contractor per Proposer team.

Lead Engineering Firm shall mean the entity designated as a Proposer’s “Lead Engineering Firm” in its SOQ. There may only be one Lead Engineering Firm per Proposer team.

Line or line means, in the context of Utilities or Highway Service Systems, a line, pipeline, conduit or cable used for utility purposes, including underground, surface or overhead facilities.

Liquidated Damages means such liquidated damages as may accrue and be due and payable by Design-Build Team to GDOT as set forth under Article 17.4 of the Agreement and as set forth under Exhibit 18 thereto.
**Loss or Losses** means any loss, damage, injury, liability, obligation, cost, response cost, expense (including attorneys’, accountants’ and expert witnesses’ fees and expenses (including those incurred in connection with the enforcement of any indemnity or other provision of the Agreement)), fee, charge, judgment, penalty or fine. Losses include injury to or death of persons, damage or loss of property, and harm or damage to natural resources.

**Major Culvert** means a culvert that provides an opening of more than 35 square feet in a single or multiple installations. A Major Culvert may consist of a single round pipe, pipe arch, open or closed-bottom box, bottomless arch, or multiple installations of these structures placed adjacent or contiguous as a unit. Certain Major Culverts are classified as bridges when they provide an opening of more than 20 feet, measured parallel to the roadway; such culverts may be included in the bridge inventory.

**Major Non-Participating Member** means a Proposer’s Lead Contractor and Lead Engineering Firm. If any of these entities qualify as a Participating Member, then that entity shall not be treated as a Major Non-Participating Member. Major Non-Participating Members are not considered Contractors to Proposer regardless of their role in the performance of Project-related services.

**Major River Crossing** means a crossing with a 100-year storm event flow in excess of 10,000 cubic feet per second (cfs).

**Management Plans** means all of the management plans identified in Section 2 of the Technical Provisions.

**Memorandum of Understanding (MOU)** means a formal agreement between GDOT and one or more agencies, organizations or providers.

**Milestone Deadline** shall have the same meaning as any Milestone Schedule Deadline.

**Milestone Schedule** means the schedule of deadlines set forth in Exhibit 9 to the Agreement, as may be adjusted upon approval of the Project Baseline Schedule as set forth in Article 3.3 of the Agreement and as may be further adjusted pursuant to any Supplemental Agreement, including on account of any Relief Events.

**Minor Culvert** means any culvert not classified as a Major Culvert.

**Mobilization** means Work to establish and remove offices, plants, and facilities; and to move personnel, equipment, and supplies to and from the Project site to begin Work or complete Work.

**NaviGAtor Contractor** means that certain Separate Contractor engaged by GDOT to provide the NaviGAtor System to be included and integrated into the ITS to be incorporated into the Project, if such system is identified in Section 17 of the Technical Provisions to be incorporated into the Project.

**NaviGAtor System** means the “NaviGAtor” advanced transportation management system to be included as a part of the ITS as set forth pursuant to Section 17.1.3 of the Technical Provisions.
**NaviGAtor Work** means the work to be provided by the NaviGAtor Contractor, coordinated with the Work, for completion of the NaviGAtor System for the Project.

**NEPA** means the National Environmental Policy Act, 42 U.S.C. § 4321 *et seq.*, as amended and as it may be amended from time to time.

**NEPA Approval** means the (a) NEPA document as approved by FHWA including any studies, reports, Environmental Commitments, and all other procedural requirements and documents required for FHWA approval for the Project or a portion of the Project, as (b) may be modified pursuant to all approved supplements and re-evaluations pertaining to the Project.

**NEPA Finality Date** means the date NEPA Approval becomes final and non-appealable and the federal statute of limitations for commencing legal action to challenge the validity of any NEPA Approval has expired.

**Nonconforming Work** means Work that does not conform to the requirements of the DB Documents, the Governmental Approvals, applicable Law or the Design Documents.

**Nonrefundable Deductions** means such nonrefundable deductions as may accrue and be due and payable by Design-Build Team to GDOT as set forth under **Article 17.4** of the Agreement and as set forth under Exhibit 18 thereto.

**Notice of Termination for Convenience** means written notice issued by GDOT to Design-Build Team terminating the Agreement in whole or in part for convenience.

**NTP** means a written notice issued by GDOT to Design-Build Team authorizing Design-Build Team to proceed with the portion or phase of the Work as being designated as subject to such notice to proceed in the Proposal Schedule, Project Schedule, or otherwise in the Agreement Documents, including without limitation NTP 1, NTP 2, and NTP 3.

**NTP 1** means a written notice issued by GDOT to Design-Build Team authorizing Design-Build Team to proceed with the portion of the Work described in **Article 3.3.1.1** of the Agreement.

**NTP 1 Conditions Deadline** means the outside date set forth in the Milestone Schedule (or the Project Baseline Schedule as to the extent such outside date is adjusted thereby) by which Design-Build Team is obligated under the Agreement to satisfy all conditions to issuance of NTP 1, as such deadline may be extended for Relief Events from time to time pursuant to the Agreement.

**NTP 2** means a written notice issued by GDOT to Design-Build Team authorizing Design-Build Team to proceed with the portion of the Work described in **Article 3.3.1.2** of the Agreement.

**NTP 2 Conditions Deadline** means the outside date set forth in the Milestone Schedule (or the Project Baseline Schedule as to the extent such outside date is adjusted thereby) by which Design-Build Team is obligated under the Agreement to satisfy all conditions to issuance of NTP 2, as such deadline may be extended for Relief Events from time to time pursuant to the Agreement.

**NTP 3** means a written notice issued by GDOT to Design-Build Team pursuant to **Article 3.3.1.3** of the Agreement authorizing Design-Build Team to proceed with the remaining Work and other activities pertaining to the Project.
NTP 3 Conditions Deadline means the outside date set forth in the Milestone Schedule (or the Project Baseline Schedule as to the extent such outside date is adjusted thereby) by which Design-Build Team is obligated under the Agreement to satisfy all conditions to issuance of NTP 3, as such deadline may be extended for Relief Events from time to time pursuant to the Agreement.

Open Book Basis means allowing the relevant Party to review all underlying assumptions and data associated with the issue in question, including, but not limited to, assumptions as to costs of the Work, schedule, composition of equipment spreads, equipment rates, labor rates, productivity, estimating factors, design and productivity allowance, contingency and indirect costs, risk pricing, discount rates, interest rates, inflation and deflation rates, and other items reasonably required by the relevant Party.


Optical Character Recognition (OCR) means the process of converting an image to text.

Owner Verification Tests (OVT) means the material tests performed in accordance with the applicable GDOT test method to verify the accuracy of the tests performed by Design-Build Team and pursuant to the approved Quality Management Plan to ensure that only materials of specified quality or better are accepted and incorporated into the Project.

P&P Bonds or Performance and Payment Bonds means the bonds meeting the requirements of Article 16.2.1 of the Agreement.

P&P Obligor means the Person identified as the obligor or account party in the P&P Bonds, as applicable.

Participating Agency means a public, quasi-public, or private agency that has agreed to cooperate with and assist Design-Build Team during an Emergency.

Participating Member means (a) if the Proposer is a joint venture, partnership, or limited liability company, each member of the joint venture, partnership or limited liability company; or (b) if the Proposer is a corporation or other corporate entity, the Proposer.

Party means Design-Build Team or GDOT, as the context may require, and “Parties” means Design-Build Team and GDOT, collectively.

Payment Activity means completion of an Element of the Work for which payment on account of the DB Contract Sum shall be due, subject to the terms of this Agreement and as follows:

(a) The first Payment Request (after NTP 1) may include the Payment and Performance Bond amounts, and may include up to 25% of the amount for Mobilization set forth in the Proposal;

(b) The first Payment Request (after NTP 3) may include up to 50% of the amount for Mobilization set forth in the Proposal, or 3% of the of the construction cost set forth in the Schedule of Values, whichever is less, minus any previous payments;
(c) After 5% of the construction cost set forth in the approved Schedule of Values is incurred, the next Payment Request may include up to 100% of the amount of Mobilization set forth in the Proposal, or 3% of the construction cost set forth in the approved Schedule of Values, whichever is less, minus any previous payments;

(d) Design-Build Team’s indirect costs such as administration, contingencies, site cleanup and maintenance, access, off site access roads and security costs related to design-build costs shall be prorated through all Payment Activities.

**Payment for Work Product** means the partial compensation to be paid to Design-Build Team as described in Form N to the ITP.

**Payment Request** means the request for payment on account of the Work all in accordance with the terms and conditions set forth in GDOT Standard Specification 109.03.

**Permanent Works** are permanent structures and parts thereof required of the completed DB Documents.

**Permitted Design Exceptions** means design exceptions identified in Section 11.2 of the Technical Provisions that are allowed to be implemented on the Project.

**Person** means any individual, corporation, joint venture, limited liability company, company, voluntary association, partnership, trust, unincorporated organization, Governmental Entity, or GDOT.

**Phase 1 Hazardous Materials Investigation** means an environmental assessment conducted in accordance with the DB Documents and ASTM E-1527-05, or any future revision or replacement thereof, to identify Recognized Environmental Conditions and potential Recognized Environmental Conditions.

**Plans** means (only where capitalized) contract drawings, working drawings, supplemental drawings, detail sheets or exact reproductions thereof, which show the location, character, dimensions and details of the Construction Work to be done.

**Pre-existing Hazardous Materials** means Hazardous Materials that meet all the following criteria:

(a) The Hazardous Materials are in, on or under the Right of Way as of the date GDOT makes available to Design-Build Team the affected parcel; or

(b) The Hazardous Materials are not located in, on or under any Project Specific Locations or Additional Properties, except Additional Properties required due to GDOT Changes (including GDOT Changes regarding the initial construction).

For purposes of determining whether Hazardous Materials were in, on or under the Right of Way or any Additional Properties required by GDOT to be included in the Property as a result of GDOT Changes, as of the date on which GDOT makes available to Design-Build Team the affected parcel, Design-Build Team shall have the burden of proof to demonstrate it was not a Design-Build Team Release of Hazardous Materials:
(i) As to any Hazardous Materials not identified as being present as of such date in the Phase 1 investigations of the Project conducted by GDOT prior to the Effective Date or any Phase 1 Hazardous Materials Investigation or Phase 2 Hazardous Materials Investigation supplementing the foregoing report prepared prior to the Effective Date; and

(ii) As to any Additional Properties required by GDOT to be included in the Property as a result of GDOT Changes, any Phase 1 Hazardous Materials Investigation thereof prepared and delivered prior to the Effective Date.

For the purpose of this definition, “makes available” means:

(x) The Effective Date, except for parcels not yet acquired as of the Effective Date; and

(y) As to parcels not yet acquired as of the Effective Date and as to Additional Properties required by GDOT to be included in the Property as a result of GDOT Changes, the date Design-Build Team first receives the right to take and maintain possession of the parcel for all purposes for the remainder of the Term in accordance with the DB Documents, including commencement of construction, as the result of GDOT’s having secured title or right of possession by contract or title instrument or by a special commissioners’ award through the eminent domain process or otherwise.

Preliminary Plans means the Design Documents which provide the preliminary design necessary for the related to construction, operations, and maintenance of the entire Project including any Utility Adjustments required by the Project.

Presidential Disaster Declaration means a declaration of a major disaster by the President of the United States triggering assistance from FEMA pursuant to the Disaster Relief Act of 1974 (Pub.L. No. 93-288, as amended).

Price Proposal means the price component of the Proposal evaluation as described in the ITP.

Price Proposal Score means the score calculated in accordance with the Price Proposal formula as described in the ITP.

Principal Project Documents means the Security Instruments and the Design-Build Contract.

Professional Engineer means a person who is duly licensed and registered by the Georgia State Board of Registration for Professional Engineers and Land Surveyors to engage in the practice of engineering in the State of Georgia, or means a person duly licensed and registered by the South Carolina State Board of Registration for Professional Engineers and Surveyors to engage in the practice of engineering in the State of South Carolina.

Professional Land Surveyor means a person registered by the Georgia State Board of Registration for Professional Engineers and Land Surveyors or the South Carolina State Board of Registration for Professional Engineers and Surveyors to practice the profession of land, boundary, or property surveying or other similar professional practices.
Project means the Project as defined in the RFP, that is the subject of this Agreement, and which shall include the transportation facilities and all related structures, and improvements, including integration of the ITS, and communications systems used in connection with operation of such transportation facilities, to be designed and constructed pursuant to the terms of the DB Documents.

Project Baseline Schedule shall have the meaning set forth in Section 2.5 of the Technical Provisions.

Project Extension means a linear addition to the original Project by Design-Build Team, including any at either terminus of the original Project and any linear improvement that interconnects with the original Project.

Project Information Coordinator means the person designated by Design-Build Team to manage Design-Build Team’s public information activities as more particularly described in Section 2.7.3 of the Technical Provisions.

Project Manager means the individual designated by Design-Build Team and approved in writing by GDOT in the position to take full responsibility for the prosecution of the Work and will act as a single point of contact on all matters on behalf of Design-Build Team.

Project Schedule shall have the meaning set forth in Section 2.5 of the Technical Provisions.

Project Specific Locations means any additional temporary property interests or rights, other than ROW or Additional Properties, which are not contiguous to the Property, that Design-Build Team may require for performance of the Work, including for temporary activities in connection with the Construction Work, such as construction work sites, temporary work areas, staging areas, storage areas, and earthwork material borrow sites.

Project Status Schedule Update means the logic-based critical path schedule submitted monthly containing progress status and enabling comparison to the Project Baseline Schedule.

Property has the meaning set forth in Article 2.2.1 of the Agreement and shall include only such property as identified in the Environmental Document Approval.

Proposal has the meaning set forth in Recital K of the Agreement.

Proposal Bond means the security that Proposers submit to GDOT with their Proposals.

Proposal Due Date means the deadline for submission of the Proposal to GDOT as defined in the ITP Section 1.4.

Proposal Revisions has the meaning set forth in Section 5.4 of the ITP.

Proposal Schedule means the high level, logic-based, critical path schedule representing Design-Build Team’s plan to complete performance of the Work beginning on the date of NTP 1 to Final Acceptance of the Work, submitted with the Proposal.

Proposed Supplemental Agreement has the meaning set forth in Article 13 of the Agreement, means a submittal by the Design-Build Team for consideration for changes in the
Work under Article 13 of the Agreement, including on account of any Relief Event Determination and/or Compensation Event Determination as set forth under Article 13.4 of the Agreement.

**Proposer** or **Proposers** has the meaning set forth in Section 1.1 in the ITP.

**Proprietary Intellectual Property** means Intellectual Property created, used, applied or reduced to practice in connection with the Project or the Work that derives commercial value from its protection as a trade secret under applicable Law or from its protection under patent law.

**Protection in Place** means any action taken to avoid damaging a Utility which does not involve removing or relocating that Utility, including staking the location of a Utility, exposing the Utility, avoidance of a Utility’s location by construction equipment, installing steel plating or concrete slabs, encasement in concrete, temporarily de-energizing power lines, and installing physical barriers. The term includes both temporary measures and permanent installations meeting the foregoing definition.

**Provided Approvals** means the Governmental Approvals for the Project obtained or to be obtained by GDOT, as specifically listed in Section 4.2 of the Technical Provisions (including any such approvals as may be required from GDOT independent of GDOT’s Project administration pursuant to Article 6.2 of the Agreement).

**Public Information and Communications Plan (PICP)** has the meaning set forth in Section 2.7.2.1 of the Technical Provisions.

**Punch List** means an itemized list of Construction Work that remains to be completed following Substantial Completion but as a condition to Final Acceptance, provided that the nature of any such incomplete Work, and the correction and completion of same, will have no material or adverse effect on the normal and safe use and operation of the Project.

**Punch List Period** means the time provided for Design-Build Team’s completion of Punch List Work, which shall be the time between Substantial Completion and Final Acceptance as provided in the Project Schedule.

**QA** means quality assurance or quality acceptance, depending on the context.

**QA/QC** means quality assurance and quality control.

**Quality Management Plan (QMP)** means the set of GDOT-approved plans for quality management and control of the Project and Work, as set forth in Section 2.3 of the Technical Provisions.

**Quality Assurance Manager (QAM)** means the individual retained by Design-Build Team as the Key Personnel with the authority and responsibility for ensuring establishment and maintenance of, and compliance with, the Quality Management Plan. The Quality Assurance Manager shall be a Professional Engineer as defined in this Exhibit 1.

**Quitclaim Deed** means a quitclaim deed to be executed by a Utility Owner relinquishing its rights to maintain a Utility in a particular location, as more particularly described in Section 6.2.2 of the Technical Provisions.
Railroad Right of Entry Agreement has the meaning described in Section 14.3.1.3 of the Technical Provisions.

Recognized Environmental Condition has the meaning set forth in ASTM E-1527-00.

Record Drawings (also known as As-Builts, as-builts, or as-built drawings) means construction drawings and related documentation revised to show as-built changes to the Project at Final Acceptance. Interim marked-in-the-field or red-lined drawings to be provided during the progress of the Work as required pursuant to the Technical Provisions shall not constitute the final Record Drawings.

Reference Information Documents (RIDs) means the collection of information, data, documents and other materials that GDOT has provided to Design-Build Team for general or reference information only.

Related Transportation Facility(ies) means all existing and future highways, streets and roads, including upgrades and expansions thereof, that is/are or will be adjacent to, connecting with or crossing under or over the Project, as specifically identified in the Technical Provisions.

Release for Construction or RFC means the written authorization by GDOT to proceed with any designated phase of the Construction Work based on the approved Final Plans.

Release of Hazardous Materials means any spill, leak, emission, release, discharge, injection, escape, leaching, dumping or disposal of Hazardous Materials into the soil, air, water, groundwater or environment, including any exacerbation of an existing release or condition of Hazardous Materials contamination.

Relief Event has the meaning set forth in Article 14.1.1 of the Agreement.

Relief Event Determination has the meaning set forth in Article 14.1.1 of the Agreement.

Relief Event Notice means the written notice required to be provided by Design-Build Team under Article 13.3.2 of the Agreement.

Replacement Housing Calculation means the opportunity to provide the displaced person with the financial assistance to purchase or rent and occupy a comparable replacement dwelling without involuntarily incurring additional financial means due to the displacement.

Replacement Utility Property Interest means any permanent right, title or interest in real property outside of the Property (e.g., a fee or an easement) that is acquired for a Utility being reinstalled in a new location as a part of the Utility Adjustment Work. The term specifically excludes any statutory right of occupancy or permit granted by a Governmental Entity for occupancy of its real property by a Utility.

Request for Change Proposal means a written notice issued by GDOT to Design-Build Team setting forth a proposed GDOT Change and requesting Design-Build Team's assessment of cost, and schedule impacts thereof, as set forth in Article 13.2.1 of the Agreement.

Request for Information (RFI) means a written request by the Design-Build Team to GDOT requesting clarification of the DB Document requirements.
Request for Proposals (RFP) means all documents, whether attached or incorporated by reference, utilized for soliciting proposals. The RFP is the only solicitation utilized by the Department in the One Phase Low Bid selection method. The RFP is the second phase utilized by the Department for the Two Phase Low Bid and Best Value selection methods.

Request for Qualifications (RFQ) means all documents, whether attached or incorporated by reference, utilized by the Department for soliciting interested Proposers to apply for prequalification including instruction for submitting a Statement of Qualification (SOQ), evaluation criteria and minimum qualifications required of a Design-Build Team. The RFQ is the first phase of a two phase process utilized by the Department for the Two Phase Low Bid and Best Value selection methods.

Reserved means a section of the DB Documents (Design-Build Agreement, Technical Provisions, or Programmatic Provisions) that is not being utilized for this contract. Sections marked Reserved have no requirements and references to sections marked Reserved shall mean that there are no additional requirements beyond the reference point.

Right of Way (ROW) means the Existing Right of Way and Proposed Right of Way.

Right of Way Acquisition Plan or ROW Acquisition Plan has the meaning set forth in Section 5 of Volume 3.

Rules have the meaning set forth in Recital H of the Agreement.

Safety Compliance means any and all improvements, repair, reconstruction, rehabilitation, restoration, renewal, replacement and changes in configuration or procedures respecting the Project to correct a specific safety condition or risk of the Project that GDOT has reasonably determined to exist by investigation or analysis and that is in violation of the requirements of the DB Documents.

Safety Compliance Order means a written order or directive from GDOT to Design-Build Team to implement Safety Compliance measures.

Safety Standards means those provisions of the Technical Provisions or Technical Documents that GDOT, FHWA, OSHA, or AASHTO considers to be important measures to protect public safety or worker safety. As a matter of clarification, provisions of Technical Provisions or Technical Documents primarily directed at durability of materials or equipment, where the durability is primarily a matter of life cycle cost rather than protecting public or worker safety, are not Safety Standards.

Schedule of Values (SOV) shall have the meaning set forth in Section 2.6 of the Technical Provisions.

Schematic Plan of Project means Design-Build Team’s Schematic Plan specific to the preliminary roadway plans showing the concept and technical solutions in accordance with the provisions of Exhibit C of the ITP. A Schematic Plan may include but is not limited to standard design plan sheets, roll plots, and conceptual drawings.

Security Document means any mortgage, deed of trust, pledge, lien, indenture, trust agreement, hypothecation, assignment, collateral assignment, financing statement under the Uniform Commercial Code of any jurisdiction, security instrument or other charge or encumbrance...
of any kind, including any lease in the nature of a security instrument, given to any Person as security for Design-Build Team Debt or Design-Build Team's obligations pertaining to Design-Build Team Debt and encumbering the Design-Build Team's Interest.

**Selection Recommendation Committee** means the group of individuals authorized by GDOT (if any) to recommend the Best Value Proposer to the Steering Committee.

**Separate Contractor(s)** means each and any separate contractor or vendor engaged by GDOT or any other governmental authority or agency of the State to perform, provide, and/or supply work, services, labor or materials for the Project that is expressly excluded from Design-Build Team’s Work pursuant to the DB Documents.

**Service Line** means a Utility line, the function of which is to directly connect the improvements on an individual property to another Utility line located off such property, which other Utility line connects more than one such individual line to a larger system. However, unless otherwise noted in the Technical Provisions, the term “Service Line” excludes any line that supplies an active feed from a Utility Owner’s facilities to supply, activate or energize GDOT’s or a Governmental Entity’s Highway Service System. Such line, including its actual connection to the Utility facility, shall instead be considered to be part of the applicable Highway Service System.

**Site** means the Property and any temporary rights or interests that Design-Build Team may acquire in connection with the Project or the Utility Adjustments included in the Construction Work, including Project Specific Locations.

**Source Code** and **Source Code Documentation** mean software written in programming languages, such as C++ and Fortran, including all comments and procedural code, such as job control language statements, in a form intelligible to trained programmers and capable of being translated into object or machine readable code for operation on computer equipment through assembly or compiling, and accompanied by documentation, including flowcharts, schematics, statements of principles of operations, architectural standards, and commentary, explanations and instructions for compiling, describing the data flows, data structures, and control logic of the software in sufficient detail to enable a trained programmer through study of such documentation to maintain and/or modify the software without undue experimentation. Source Code and Source Code Documentation also include all modifications, additions, substitutions, updates, upgrades and corrections made to the foregoing items.

**South Carolina Work** means that portion of the Work located within the State of South Carolina.

**Staged Design Submittals** shall have the meaning set forth in **Section 3.6.1** in the Technical Provisions.

**Standard Utility Agreement (SUA)** means an Agreement providing for relocation or adjustment work to be performed by the Utility and/or its consultant or contractor and modification of easement limited provisions, if applicable. To the extent practical, reimbursement by the Department will be made based upon the Department’s specifications, agreements and forms or consultant and construction contract work. The payment method may be actual cost, unit price, or lump sum as appropriate.

**State** means the State of Georgia.
State and Local Government Series (SLGS) Index means the State and Local Government Series (SLGS) Index published and maintained by the United States Department of the Treasury.

State Highway means a highway designated as part of the state highway system under Code 32-4-21.

Statement of Qualifications or SOQ has the meaning set forth in Section 1.1 of the ITP.

Stipulated Fee means the amount GDOT will pay unsuccessful responsive Proposers for their Work Product.

Subcontractor means any other Person, including any Supplier with whom any Contractor has further subcontracted, purchased or procured any part of the Work, at all tiers.

Submittal means any document, work product or other written or electronic end product or item required under the DB Documents to be delivered or submitted to GDOT, as applicable.

Substantial Completion means satisfaction of the criteria for completion of Construction Work as set forth in Article 7.7 of the Agreement, as and when confirmed by GDOT’s issuance of a certificate in accordance with the procedures and within the time frame established in Article 7.7.1 of the Agreement.

Substantial Completion Date means the date upon which Design-Build Team has satisfied all conditions of and for Substantial Completion.

Substantial Completion Deadline means the deadline and required date for Substantial Completion of the Project as set forth in the Milestone Schedule, as such deadline may be extended for Relief Events from time to time pursuant to the Agreement, time being of the essence.

Substitute has the meaning set forth in the Direct Agreement.

Subsurface Utility Engineering (SUE) means an engineering process for accurately identifying the quality of subsurface utility information needed for highway plans, and for acquiring and managing that level of information during the development of a highway project, as more particularly described at the FHWA website http://www.fhwa.dot.gov/programadmin/sueindex.cfm.

Supplemental Agreement means a mutual agreement between GDOT and Design-Build Team for changes in the Work under Article 13 of the Agreement, including on account of any Relief Event Determination and/or Compensation Event Determination as set forth under Article 13.4 of the Agreement.

Supplier means any Person not performing work at or on the Site that supplies machinery, equipment, materials, hardware, software, systems or any other appurtenance to the Project to Design-Build Team or to any Contractor in connection with the performance of the Work. Persons who merely transport, pick up, deliver or carry materials, personnel, parts or equipment or any other similar items or persons to or from the Site shall not be deemed to be performing Work at the Site.
Surety means each properly licensed surety company, insurance company or other Person approved by GDOT, which has issued any of the P&P Bonds.

Taxes means federal, State, local or foreign income, margin, gross receipts, sales, use, excise, transfer, consumer, license, payroll, employment, severance, stamp, business, occupation, premium, windfall profits, environmental (including taxes under Section 59A of the Internal Revenue Code of 1986, as amended), customs, permit, capital stock, franchise, profits, withholding, social security (or similar), unemployment, disability, real property, personal property, registration, value added, alternative or add-on minimum, estimated or other taxes, levies, imposts, duties, fees or charges imposed, levied, collected, withheld or assessed at any time, whether direct or indirect, relating to, or incurred in connection with, the Project, the performance of the Work, or act, business, status or transaction of Design-Build Team, including any interest, penalty or addition thereto, and including utility rates or rents, in all cases whether disputed or undisputed.

Technical Documents means all the standards, criteria, requirements, conditions, procedures, specifications and other provisions set forth in the manuals and documents identified in the DB Documents, as such provisions may (a) have been generally revised from time to time up the RFP advertisement date, or (b) be changed, added to or replaced pursuant to the Agreement.

Technical Proposal means the technical component of the Proposal evaluation as described ITP.

Technical Provisions means Volume 2 and Volume 3; as such documents may (a) have been generally revised from time to time up to ninety (90) days prior to the Proposal Due Date, or (b) be changed, added to or replaced pursuant to the Agreement.

Temporary Works is any temporary construction work necessary for the construction of the Permanent Works. This includes falsework, formwork, scaffolding, shoring, temporary earthworks, sheeting, cofferdams, special erection equipment, etc.

Term has the meaning set forth in Article 3.1.1 of the Agreement.

Termination by Court Ruling has the meaning set forth in Article 19.11 of the Agreement.

Termination Compensation means each of the measure of compensation owing from GDOT to Design-Build Team upon termination of the Agreement prior to the stated expiration of the Term, pursuant to Article 19, and as set forth in Exhibit 20 to the Agreement.

Termination Date means (a) the date of expiration of the Term or (b) if applicable, the Early Termination Date.

Termination for Convenience has the meaning set forth in Article 19.1.1 of the Agreement.

Third-Party Claims means, subject to Article 16.5.4 of the Agreement, any and all claims, disputes, disagreements, causes of action, demands, suits, actions, investigations, or legal or administrative proceedings asserted, initiated or brought by a Person that is not an Indemnified Party or Design-Build Team with respect to any Third-Party Loss.
**Third-Party Loss** means, subject to Article 16.5.4 of the Agreement, any actual or alleged Loss sustained or incurred by a Person that is not an Indemnified Party or Design-Build Team.

**Threatened or Endangered Species** means any species listed by the USFWS as threatened or endangered pursuant to the Endangered Species Act, as amended, 16 U.S.C. §§ 1531, et seq.

**Traffic Management Center** is a center for the management and distribution of information to Users on a regional or statewide basis.

**Transferee** means any party as defined pursuant to Article 21.2.2.1 of the Agreement, solely for purposes of Articles 21.2 through 21.5 of the Agreement.

**Transportation Management Plan** means Design-Build Team’s plan for transportation management throughout the Term, as more particularly described in Article 9.2.2 of the Agreement and Section 18.2.1 of the Technical Provisions.

**Travel Lane** means the portion of roadway for the movement of vehicles, exclusive of shoulders.

**Uniform Act** means the Federal Uniform Relocation Assistance and Real Property Acquisition Policies Act, P.L. 91-646, as amended.

**Uninsurable Risk** means a risk, or any component of a risk, against which Design-Build Team or a Contractor is required to insure pursuant to the Agreement and for which, at any time after the Effective Date, either:

(a) the insurance coverage required under the Agreement is not available in relation to that risk from insurers that meet the qualifications set forth in Article 16.1.2 of the Agreement; or

(b) the terms and conditions for insuring that risk are such that the risk is not generally being insured against in the insurance market under commercially reasonable terms from insurers that meet the qualifications set forth in Article 16.1.2 of the Agreement.

**Utility** or **utility** means any of the following:

(a) a public, private, cooperative, municipal and/or government line, facility or system used for the carriage, transmission and/or distribution of cable television, electric power, telephone, telegraph, water, gas, oil, petroleum products, steam, chemicals, hydrocarbons, telecommunications, sewage, and similar commodities, that directly or indirectly serves the public;

(b) a line, facility or system which (i) carries or transmits a commodity referenced in clause (a) above but does not directly or indirectly serve the public, and (ii) is designated in Volume 1 or Volume 2 to be treated, for purposes of the DB Documents only, in the same manner as a line, facility or system that qualifies as a Utility under clause (a) above; and

(c) a radio tower or transmission tower (including cellular) that directly or indirectly serve the public.

Notwithstanding the foregoing, the term “Utility” or “utility” excludes:
(a) all storm water lines, facilities, and systems that are part of the drainage system for the Property or connect to that system; and

(b) GDOT’s or a Governmental Entity’s Highway Service Systems.

The necessary appurtenances to each Utility facility shall be considered part of such Utility. Any Service Line connecting directly to a Utility shall be considered an appurtenance to that Utility, regardless of the ownership of such Service Line.

**Utility Accommodation Manual (UAM)** means the Utility Accommodation Manual issued by GDOT, at Ga. Comp. R. & Regs. r. 672-11-.01 through -.04, as the same may be amended, supplemented or replaced by GDOT from time to time.

**Utility Adjustment Field Modification** means any horizontal or vertical design change to a Utility Adjustment required by Design-Build Team or proposed by a Utility Owner due either to roadway design or to conditions not accurately reflected in the corresponding Utility Work Plan for which the review and comment/approval process has been completed, that alters the design included in the approved Utility Work Plan. An example would be shifting the alignment of an 8" water line to miss a roadway drainage structure. A minor change (e.g., an additional water valve, an added Utility marker at ROW line, a change in vertical bend, etc.) will not be considered a Utility Adjustment Field Modification, but shall be shown in the Record Drawings.

**Utility Adjustment** means each relocation (temporary or permanent), abandonment, Protection in Place, removal (of previously abandoned Utilities as well as of newly abandoned Utilities), replacement, reinstallation, and/or modification of existing Utilities necessary to accommodate construction, operation, maintenance and/or use of the Project; provided, however, that the term “Utility Adjustment” shall not refer to any of the work associated with facilities owned by any railroad. For any Utility crossing the Property, the Utility Adjustment Work for each crossing of the Property by that Utility shall be considered a separate Utility Adjustment. For any Utility installed longitudinally within the Property, the Utility Adjustment Work for each continuous segment of that Utility located within the Property shall be considered a separate Utility Adjustment.

**Utility Adjustment Work** means all efforts and costs necessary to accomplish the required Utility Adjustments, including all coordination, design, design review, permitting, construction, inspection, maintenance of records, relinquishment of Existing Utility Property Interests, preparation of Utility Joint Use Acknowledgements, and acquisition of Replacement Utility Property Interests, whether provided by Design-Build Team or by the Utility Owners. The term also includes any reimbursement of Utility Owners which is Design-Build Team’s responsibility pursuant to Article 7.5 of the Agreement. Any Utility Adjustment Work furnished or performed by Design-Build Team is part of the Work; any Utility Adjustment Work furnished or performed by a Utility Owner is not part of the Work.

**Utility Enhancement** means a Betterment or a Utility Owner Project, as referenced in Section 6.1.4.1 of the Technical Provisions.

**Utility Joint Use Acknowledgment** or **Utility Joint Use Agreement** means an agreement between GDOT and a Utility Owner that establishes the rights and obligations of GDOT and the Utility Owner with respect to occupancy of the Property by such Utility Owner’s Utility.
Utility Manager (UM) means the senior staff person designated by Design-Build Team to be responsible for coordination and oversight of Utility Adjustment operations during the planning, design, and construction phases of the Work, as more particularly described in Section 6.1.3.4 of the Technical Provisions.

Utility Owner means the owner or operator of any Utility (including both privately held and publicly held entities, cooperative utilities, and municipalities and other governmental agencies).

Utility Owner Project means the design and construction by or at the direction of a Utility Owner (or by Design-Build Team) of a new Utility other than (a) as part of a Utility Adjustment or (b) to provide service to the Project. Betterments are not Utility Owner Projects. Utility Owner Projects are entirely the financial obligation of the Utility Owner.

Utility Tracking Report means the report regarding Utilities likely to be impacted by the Project, which Design-Build Team shall maintain on a current basis, as more particularly described in Section 6.5.1 of the Technical Provisions.

Utility Work Plan has the meaning set forth in Section 6.3.2.5 of the Technical Provisions. Depending on the context, the term also refers to Supplemental Utility Work Plans and Utility Work Plan Retention Requests (both also described in Section 6.3.2.5 of the Technical Provisions).

Utility Work Plan Checklist means a checklist listing the required components of a Utility Work Plan, as referenced in Section 6.3.2.5 of the Technical Provisions.

Utility Work Plan Retention Request means the collection of plans and other information and materials which Design-Build Team is required to submit to GDOT in connection with each Utility proposed to remain at its original location within the Existing Right of Way or Property, as more particularly described in Section 6.3.2.5 of the Technical Provisions; a single Utility Work Plan Retention Request may address more than one such Utility.

Volume 1 means the Design-Build Agreement or the Agreement.

Volume 2 means the project-specific technical provisions entitled “Technical Provisions - Volume 2”.

Volume 3 means GDOT’s technical provisions entitled “Programmatic Technical Provisions - Volume 3”.

Warning Notice means a written notice that GDOT delivers to Design-Build Team pursuant to Article 17.2 of the Agreement.

Work means all of the work required to be furnished and provided by Design-Build Team under the DB Documents for the Project, including without limitation, all administrative, management, design, engineering, other professional services, construction, Utility Adjustment, utility accommodation, support services, ETCS and software integration, and coordination, except for those efforts which such DB Documents expressly specify will be performed by Persons other than Design-Build Team-Related Entities, all as required and as may reasonably inferred for full and proper completion of the Project in accordance with this Agreement and the DB Documents.
Work Breakdown Structure (WBS) means a deliverable-oriented hierarchical structure that breaks the Work into elements that have distinct identification and that contain specific scope characteristics. Each descending WBS level represents an increasingly detailed delineation of elements of the total Project scope. The WBS will contain all elements of the Work.

Work Code means a code assigned to a contract line item. Example: 400 is asphalt paving, 653 is highway traffic striping. The Work Codes were established and predefined by a GDOT Committee comprised of the Office of EEO, Construction, Bidding Administration, and Prequalification, in 2012. Not every item has a work code, only those items that are predominantly used on Highway construction projects. Contractors and Subcontractors in the GDOT directories are assigned work codes based upon their work description. Work codes are the most refined data available.

Work Product means any design files, concepts, ideas, technology, techniques, methods, processes, drawings, reports, plans and specifications used in the development of the bid and technical proposal including any ATCs being acquired by GDOT.
EXHIBIT 2

DESIGN-BUILD TEAM’S PROPOSAL COMMITMENTS AND KEY PERSONNEL

Technical Proposal

As set forth in DB Team’s Proposal dated September 26, 2018, including but not limited to Volume 2, Technical Proposal, including schematic designs, conceptual construction staging drawings, and proposal schedule in accordance with the provisions of the Instructions to Proposers, Exhibit C, and hereby incorporated by reference.

Proposal Commitments

As set forth in the Proposal as defined in the Agreement and hereby incorporated by reference, subject to the provisions of Article 1.2.2.

Identified Key Personnel

- Form G – Form of Participating Members, Major Non-Participating Members, Contractors and Key Personnel Commitment of the Proposal is attached hereto and incorporated by reference.

- The Proposal Organization Chart in C.1.4.1 of the Proposal is attached hereto and incorporated by reference.

Other Proposal Commitments

The following Proposal documents are attached hereto and incorporated by reference.

- Form F – Design-Build Price Proposal
- Form K – Use of Contract Funds for Lobbying Certification
- Form L – Debarment and Suspension Certification
- Approved and included ATCs
FORM G

Form of Participating Members, Major Non-Participating Members, Contractors and Key Personnel Commitment

Proposer's Name: Superior Construction Company Southeast, LLC (the "Proposer")

The Proposer hereby commits that, if awarded the I-20 at Savannah River Bridge Replacements and Roadway Widening Project (the "Project"), the Proposer will use the entities and individuals listed below for their stated positions and that, to the extent within the Proposer's control, such entities and individuals will be available to fulfill their Project-related responsibilities.

Lead Contractor: Superior Construction Company Southeast, LLC

Participating Member: N/A

Lead Design Consultant: WSP USA

Key Personnel (Participating Members and Major Non-Participating Members, as appropriate):

- Lead Contractor Project Manager: Rob Clark, P. E.
- Lead Design Consultant Project Manager: John Poulson, P. E.
- Engineer of Record (Georgia): Geoffrey Donald, P. E.
- Engineer of Record (South Carolina): Sherri Williamson, P. E.
- Contractor Superintendent: Kenny Wooten
- Construction Quality Control Manager: Kevin Born

Signed: [Signature]

Printed Name: Pete Kelley

Title: Manager

Date: 09/21/18
FORM F

Design-Build Price Proposal

Proposer Name: Superior Construction Company Southeast, LLC

The Proposer shall complete the required fields of Section A and Section D below. See Exhibit D for additional explanation and requirements.

A. Design-Build Contract Sum

| Design Complete: | $13,770,000.00 |
| Construction Complete: | $5,668,170.00 |
| Design-Build Contract Sum: | $19,438,170.00 |

The Proposer shall indicate its proposed Design-Build Contract Sum on this Form F, such Design-Build Contract Sum shall include all Design-Build Team cost and expenses.

B. Reserved
C. Reserved
D. Proposal Schedule of Values (SOV)

All items below shall be provided as Lump Sum amounts.

<table>
<thead>
<tr>
<th>Activity Description</th>
<th>Georgia Work</th>
<th>South Carolina Work</th>
<th>Total Price</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DESIGN COMPLETE</strong></td>
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<td></td>
</tr>
<tr>
<td>1. General Conditions*</td>
<td>$75,000.00</td>
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<td>2. Permitting</td>
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<td>3. Design</td>
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<td></td>
<td><strong>Design Complete</strong></td>
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<td><strong>$9,150,000.00</strong></td>
</tr>
<tr>
<td><strong>CONSTRUCTION COMPLETE</strong></td>
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<td></td>
</tr>
<tr>
<td>4. Mobilization</td>
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<td>5. Field Office</td>
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<td>6. Work Zone Law Enforcement</td>
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<td>7. Record Drawings, Punch List, Demobilization, and Final Close-out</td>
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<td>$25,000.00</td>
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<td>8. Structure Demolition</td>
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<td>9. Foundations</td>
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<td>$2,200,000.00</td>
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<td>10. Substructure Concrete</td>
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<td>11. Superstructure</td>
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<td>12. Superstructure Beams</td>
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<tr>
<td>Activity Description</td>
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<td>South Carolina Work</td>
<td>Total Price</td>
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<td>13. Approach Slabs</td>
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<td>14. Structural Walls</td>
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<td>15. Traffic Control</td>
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<td>16. Erosion Control</td>
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<td>17. Grading</td>
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<td>18. Drainage</td>
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<td>19. Barrier and Guardrail</td>
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<td>20. Aggregate Base Course</td>
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<td>21. Asphalt Paving</td>
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<td>22. Concrete Paving</td>
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<tr>
<td>23. Striping and Signing</td>
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<td>$1,580,000</td>
<td>$1,960,000.00</td>
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<td>24. ITS</td>
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<td>25. Lighting</td>
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<td>26. Utilities</td>
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<td>27. Training Hours</td>
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<td><strong>$71,928,170.00</strong></td>
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*Includes all management, management plans, payment and performance bond, insurance, project management and coordination, home office overhead and support, and quality management.*

**BY SIGNATURE BELOW AND SUBMITTAL OF THIS FORM E WITH THE PROPOSAL SCHEDULE, THE PROPOSER HEREBY CERTIFIES IT HAS REVIEWED ITS PROPOSAL SCHEDULE AND PROPOSAL ESTIMATES FOR THE PROJECT AND THAT ALL WORK, INCLUDING EARLY PORTIONS OF THE WORK, CAN BE COMPLETED WITHIN THE MILESTONE DEADLINES, INCLUDING INTERIM COMPLETION MILESTONES, SUBSTANTIAL COMPLETION AND FINAL ACCEPTANCE. THE MOBILIZATION SHALL NOT EXCEED 2.5% OF THE TOTAL CONSTRUCTION COMPLETE.**

**Date:** 09/21/18  
**Signature:**  
**Design-Build Team:** Superior Construction Company Southeast, LLC  
**Vendor No.:** 2SU503
FORM K

Use of Contract Funds for Lobbying Certification

The undersigned Proposer certifies on behalf of itself and all contractors (at all tiers) the following:

1. The Proposer certifies, to the best of its knowledge and belief, that:
   a. No federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any federal contract, the making of any federal grant, the making of any federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any federal contract, grant, loan, or cooperative agreement.
   b. If any funds (other than federal appropriated funds) received by the Proposer under the RFP or DBA have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with any federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions, and shall include a copy of said form in its proposal or bid, or submit it with the executed DBA or any or Subcontract.

2. This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by 31 U.S.C. 1352. Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

3. The Proposer shall require that the language of this certification be included in all lower tier subcontracts which exceed $100,000 and that all such recipients shall certify and disclose accordingly.

4. The undersigned certifies or affirms the truthfulness and accuracy of each statement of its certification and disclosure, if any. In addition, the undersigned understands and agrees that the provisions of 31 U.S.C. §3801, et seq., apply to this certification and disclosure, if any.

[Note: Pursuant to 31 U.S.C. §1352(c)(1)-(2)(A), any person who makes a prohibited expenditure or fails to file or amend a required certification or disclosure form shall be subject to a civil penalty]
of not less than $10,000 and not more than $100,000 for each expenditure or failure.]

Date: 09/21/18

Proposer: Superior Construction Company Southeast, LLC

Signature: 

Title: President
FORM L

Debarment and Suspension Certification

The undersigned Proposer certifies on behalf of itself, and all Participating Members, Major Non-Participating Members and Contractors identified by such Proposer as of the date hereof, as follows:

The undersigned certifies to the best of its knowledge and belief, that it and its principals:

a. Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any federal department or agency;

b. Have not within a 3-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (federal, State or local) transaction or contract under a public transaction; violation of federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;

c. Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (federal, State or local) with commission of any of the offenses enumerated in paragraph 1b of this certification; and

d. Have not within a 3-year period preceding this application/proposal had one or more public transactions (federal, State or local) terminated for cause or default.

Where the Proposer is unable to certify to any of the statements in this certification, it shall attach a certification to its proposal or bid stating that it is unable to provide the certification and explaining the reasons for such inability.

Date: 09/21/18

Proposer: Superior Construction Company Southeast, LLC

Signature:

Title: President
August 30, 2018

Superior Construction Co, Inc.
Attention: Mr. David Nardon
7072 Business Park Boulevard North
Jacksonville, FL 32256

RE: ATC SWSP-001A
I-20 at Savannah River Bridge Replacement Design-Build Project

Dear Mr. Nardon:

The Georgia Department of Transportation has completed review of the above mentioned ATC and provides the following response:

___ X ___ The ATC, as submitted, is acceptable for inclusion in the Proposal.

___ ___ The ATC is not acceptable for inclusion in the Proposal.

___ ___ The ATC is not acceptable in its present form, but may be acceptable upon the satisfaction, in GDOT’s sole discretion, of certain identified conditions which must be met or clarifications or modifications that must be made, including, but not limited to, any required environmental reevaluation related to the ATC, which GDOT may condition upon a GDOT Re-evaluation Period.

___ ___ The submittal does not qualify as an ATC but may be included in Proposer’s Proposal because it appears to be within the requirements of the RFP.

___ ___ The submittal does not qualify as an ATC and may not be included in the Proposal.

Please see the attached comments that were generated relative to the decision provided above.
If an ATC is resubmitted, the resubmission shall be provided with the same three-digit number with an alpha numeric letter starting with the letter “A” for the first resubmittal and “B” for a second submittal, etc., and the resubmittal shall address all comments for re-review.

The Georgia Department of Transportation appreciates the effort by your team to provide innovation and improve the overall success of the I-20 at Savannah River Bridge Replacement Design-Build Project.

Sincerely,

Darryl D. VanMeter, P.E.
Assistant P3 Division Director/
State Innovative Delivery Administrator

Attachment: ATC Review Form

CC: Chip Meeks, Procurement Officer
    General Files
CONFIDENTIAL

ATC Review Form

1. General comments:
   a. All design criteria and submittals are subject to GDOT review and acceptance after award of the Project.

2. Environmental comments:
   a. No comment

3. Utilities comments:
   a. No comment

4. Right of Way comments:
   a. No comment

5. Geotechnical comments:
   a. No comment

6. Roadway comments:
   a. No comment

7. Drainage/Erosion Control comments:
   a. No comment

8. Bridges/Structures comments:
   a. No comment

9. ITS comments:
   a. No comment

10. Signing and Marking comments:
    a. No comment

11. Other
    a. No comment
A. Alternative Technical Concept ATC001A

Pavement Design Modification – Concrete Pavement Rubblization in Georgia

B. Description

The existing I-20 pavement is jointed concrete pavement constructed in the mid-1960s with a design thickness of nine inches over three inches of aggregate bituminous stabilized sub-base and five inches of granular sub-base. The Superior Construction Company Southeast, LLC/WSP USA Inc. (Superior/WSP) proposes to repurpose the existing concrete pavement as a structural aggregate base layer for the new pavement structure. Superior/WSP will utilize concrete pavement rubblization, described below, to convert the concrete pavement into aggregate base. The intent of this Alternative Technical Concept (ATC) is to seek approval on this approach as an alternate pavement design.

Rubblization is the process of fracturing Portland Cement Concrete Pavement (PCCP) into small interconnected pieces that serves as aggregate base course. Properly rubblized PCCP results in the complete destruction of any slab action and creates an aggregate base with a high degree of particle-to-particle interlock and is more competent than most aggregate base layers. This provides the benefit of creating a solid foundation for the new pavement section utilizing existing in place materials. To achieve the particle-to-particle interlock, Superior/WSP proposes to use a multi-head hammer breaker (MHB) to perform the concrete pavement rubblization. The MHB construction train process consists of MHB to fracture the existing PCCP a full lane width in one pass, herringbone patterned bar grid roller to provide fine particle breakage in top third of layer, pneumatic roller to provide broken particle interlock deep within the layer, and smooth steel drum roller to provide profile grade control.

A major benefit to the MHB construction train process is that asphalt paving operations for the interlayer of 19 millimeters Superpave may follow immediately behind it—providing significant schedule savings. Before rubblization, our team will saw full depth joints and completely sever load transfer devices to isolate the rubblizing area. Reinforcing steel exposed at the surface will be removed by cutting below the surface and disposing of the steel. The rubblized area will be compacted with a vibratory steel roller. The number of passes can be adjusted by the Engineer to achieve the desired compaction and stability. Loose asphaltic patching material, joint fillers, expansion material or other similar materials will be removed from the compacted surface. Localized depressions will be filled with graded aggregate base and brought to design grade and compacted. Since the 1990s, rubblization of existing concrete pavement for HMA and concrete overlays has been done by a number of state department of transportations (DOTs) and results have shown good performance.

C. Usage

Superior/WSP proposes this ATC will be used on I-20 mainline pavement replacement areas. Bridge decks and approach slabs will be excluded.

D. Contract Changes

Volume 2 Technical Provisions, Table 11-1: Pavement Designs provides pavement designs for the project. Superior requests, with this ATC to rubblize the existing concrete pavement and utilize as aggregate base, profile, and compact as necessary with graded aggregate base, place 3-inch 19 millimeter asphalt interlayer and construct 12 inches of Plain PC Concrete Pavement Cl 1.
E. Justification

Rubbilization will reduce the overall roadway construction schedule, impacts to the traveling public, and impacts to the environment by lessening haul trucks on the road. Trucking for slab and existing base disposal will be eliminated. Likewise, this will significantly reduce trucks from entering the work zone with new base material. This will provide a safer work zone for the traveling public and construction crews as well. This method is a proven, complete in place recycle that will provide the same level of quality in an expedited delivery time, and saves overall project cost. Use of the concrete pavement rubblization significantly reduces the construction materials needed, thus reducing costs and construction duration.

F. Impacts

Concrete pavement rubblization reduces construction duration which benefits GDOT, other stakeholders and the traveling public in several ways: reduces user delays, benefits the local environment from less demolition waste disposal, and reduces vehicle emissions from both construction vehicles and the traveling public. Communities benefit from reduced noise and dust, and elimination of the concrete and base removal improves safety for the traveling public with fewer potential conflicts with construction vehicles. Use of the concrete pavement rubblization significantly reduces the construction materials needed, thus reducing cost and construction duration.

G. Cost Savings

The use of the proposed ATC has the potential to reduce construction costs by approximately $300,000. This is based on the reduction of graded aggregate base.

H. Time Savings

The use of the proposed ATC will allow roadway construction to be completed more efficiently. We anticipate saving approximately one month on the roadway construction schedule.

I. Risks

Superior does not foresee any added risk to GDOT or other entities associated with implementation of this ATC. Reducing the overall duration of the roadway construction elements limits impacts and disruptions to the traveling public, thereby, minimizing the risks associated with this ATC. In areas where concrete pavement rubblization is used, the risk associated with having finished subgrade exposed to the elements and moisture prior to the asphalt interlayer is nearly eliminated.

J. Quality

Arkansas has used concrete pavement rubblization successfully on a number of major interstate reconstruction projects. Agencies like Alabama, Arkansas, Pennsylvania, and Michigan Departments of Transportation consider rubblization one of their primary rehabilitation strategies for rigid pavements on heavily traveled roadways. The Wisconsin Department of Transportation and Federal Highway Administration (FHWA) funded research through the Wisconsin Highway Research Program for “Guidance, Parameters, and Recommendations for Rubblized Pavements,” SPR# 0092-05-07, dated January 2007 and Portland Cement Concrete Pavement over Rubblized PCC, SPR# 0092-00-11, dated March 2008.

K. Costs

No additional costs associated with the approval and implementation of this proposed ATC have been identified for GDOT or other stakeholders.
I-20 at Savannah River Bridge Replacements and Roadway Widening Project

Alternative Technical Concept

L. Operations

As described above, rubblization of the existing concrete pavement will eliminate existing slab and base course removal on I-20, as well as import of new aggregate base. The rubblization will result in converting the existing concrete pavement into an aggregate base. The base will be brought to design profile by compacted graded aggregate base and then construction of the asphalt interlayer and new 12-inch Plain PC concrete.

M. Maintenance

No change

N. Anticipated Life

No change

O. Right-of-Way

No Right-of-Way required for this ATC.

P. Past Use

Arkansas, Alabama, Michigan, Pennsylvania, and Wisconsin use rubblization of existing concrete pavement as an accepted strategy for concrete pavement rehabilitation.

Q. Sale of Work Product

We are prepared to sell this ATC to GDOT in accordance with the terms of Section 3.8 of the RFP.
Responses to GDOT request for additional information (Item 5 Geotechnical comments):

i. Provide subgrade and pavement investigation/analysis to ensure conditions that would result in severe construction problems (i.e., extensive removal and replacement of existing pavement, weak/wet subgrade, etc.) and accounted for.

Response: The soil survey performed for this project by Ranger Consulting Inc. for GDOT, showed only several localized areas in the existing roadway embankment that contained weak soils (ClassIIIC2) and/or high moisture-content soils. The remainder of the soils within the existing embankment appeared to be good quality (IIB3 or better) soils with low moisture contents. However, prior to the rubblization process, Willmer Engineering will conduct a Soil Survey investigation to obtain samples adjacent to the travel lanes to determine the potential for additional weak/wet subgrade soils. The investigation will include in-place tests and lab tests on samples obtained, including soil support capacity. If weak/wet soils are found, one or more of the following measures will be used:

1. Adjusting the rubblization energy to not overstress underlying areas
2. Removing and replacing the weak/wet subgrade soils
3. Adjusting the pavement design in these areas to account for these soils

ii. Prior to rubblization, field analysis such as FWD testing, soil sampling, and soil bearing capacity to determine subgrade condition shall be performed.

Response: See above response for item i.

iii. Provide the structural number used for rubblization.

Response: The structural number (SN) used for rubblization is 0.22. By comparison, the SN for graded aggregate base (GAB) and full-depth reclamation (FDR) are 0.16 and 0.26 respectively.

iv. Provide clarification on how drainage will be maintained (i.e., underdrain).

Response: The drainage characteristics of the rubblized material will be equal to the new roadway section with GAB. To ensure proper drainage, we will install the GAB to extend below the depth of the rubblized area, or install underdrain as necessary.

v. Provide overview of how traffic will be maintained. Traffic will not be allowed on roadways during rubblization process.

Response: Traffic will be shifted to newly constructed pavement prior to rubblization occurring. Traffic will not be on roadways that are being rubblized. Rubblization will occur on closed sections of roadway.
FORM P

ATC Checklist

The DB Team shall check mark in the appropriate box for each item. Any box left incomplete will require a resubmittal of the ATC. If "Change Required" box is checked, the DB Team shall provide a description of the change or deviation from the NEPA Approval, Technical Provisions (Volume 2, Volume 3 and their respective attachments), Technical Documents (Volume 3, Attachment 3-1), and the DBA Volume requirements.

[See following pages]
### NEPA Study Impacts

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### DB Contract – Volumes 2 and/or 3

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- Section 8 - Geotechnical
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- Section 20 - Bicycle and Pedestrian Facilities
- Section 21 - Reserved
- Section 22 - Noise Barriers
- Section 23 - Reserved
- Section 23 - Reserved
- Any related Attachments

### Design Exceptions and Variances

| Does the ATC require any Design Exceptions? | x |
| Does the ATC require any Design Variances? | x |

### List of Manuals which require changes

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<th>Volume 3, Attachment 3-1 (list any Manuals which require changes including section number)</th>
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September 6, 2018

Superior Construction Co, Inc.
Attention: Mr. David Nardon
7072 Business Park Boulevard North
Jacksonville, FL 32256

RE: ATC SWSP-002A
I-20 at Savannah River Bridge Replacement Design-Build Project

Dear Mr. Nardon:

The Georgia Department of Transportation has completed review of the above mentioned ATC and provides the following response:

___ X ___ The ATC, as submitted, is acceptable for inclusion in the Proposal.

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The Georgia Department of Transportation appreciates the effort by your team to provide innovation and improve the overall success of the I-20 at Savannah River Bridge Replacement Design-Build Project.

Sincerely,

Darryl D. VanMeter, P.E.
Assistant P3 Division Director/
State Innovative Delivery Administrator

Attachment: ATC Review Form

CC: Chip Meeks, Procurement Officer
    General Files
CONFIDENTIAL

ATC Review Form

1. General comments:
   a. All design criteria and submittals are subject to GDOT review and acceptance after award of the Project.

2. Environmental comments:
   a. No comment

3. Utilities comments:
   a. No comment

4. Right of Way comments:
   a. No comment

5. Geotechnical comments:
   a. This ATC is acceptable provided the DB Team:
      i. Use of HMA for all leveling of the rubblized surface (no GAB) in low spots.
      ii. Use SCDOT Type E for depths 1.5" or less and Type C for depths greater than 1.5". (Use GDOT equivalent to SCDOT mix types).
      iii. Utilize proof rolling. Follow SCDOT Standard Specification Section 211 or GDOT equivalent.

6. Roadway comments:
   a. No comment

7. Drainage/Erosion Control comments:
   a. No comment

8. Bridges/Structures comments:
   a. No comment

9. ITS comments:
   a. No comment

10. Signing and Marking comments:
    a. No comment

11. Other
    a. No comment
I-20 at Savannah River Bridge Replacements and Roadway Widening Project
Alternative Technical Concept

A. Alternative Technical Concept ATC002A

Pavement Design Modification – Concrete Pavement Rubblization in South Carolina

B. Description

The existing I-20 pavement is jointed concrete pavement constructed in the mid-1960s. The Superior Construction Company Southeast, LLC/WSP USA Inc. (Superior/WSP) proposes to repurpose the existing concrete pavement as a structural aggregate base layer for the new pavement structure. Superior/WSP will utilize concrete pavement rubblization, described below, to convert the concrete pavement into aggregate base. The intent of this Alternative Technical Concept (ATC) is to seek approval on this approach as an alternate pavement design.

Rubblization is the process of fracturing Portland Cement Concrete Pavement (PCCP) into small interconnected pieces that serves as aggregate base course. Properly rubblized PCCP results in the complete destruction of any slab action and creates an aggregate base with a high degree of particle-to-particle interlock and is more competent than most aggregate base layers. This provides the benefit of creating a solid foundation for the new pavement section utilizing existing in place materials. To achieve the particle-to-particle interlock, Superior/WSP proposes to use a multi-head hammer breaker (MHB) to perform the concrete pavement rubblization. The MHB construction train process consists of MHB to fracture the existing PCCP a full lane width in one pass, herringbone patterned bar grid roller to provide fine particle breakage in top third of layer, pneumatic roller to provide broken particle interlock deep within the layer, and smooth steel drum roller to provide profile grade control.

A major benefit to the MHB construction train process is that asphalt paving operations for the interlayer of 175 HMA surface type C may follow immediately behind it—providing significant schedule savings. Before rubblization, our team will saw cut full depth joints and completely sever load transfer devices to isolate the rubblizing area. Reinforcing steel exposed at the surface will be removed by cutting below the surface and disposing of the steel. The rubblized area will be compacted with a vibratory steel roller. The number of passes can be adjusted by the Engineer to achieve the desired compaction and stability. Loose asphaltic patching material, joint fillers, expansion material or other similar materials will be removed from the compacted surface. Localized depressions will be filled with graded aggregate base and brought to design grade and compacted. Since the 1990s, rubblization of existing concrete pavement for HMA and concrete overlays has been done by a number of state department of transportations (DOTs) and results have shown good performance.

C. Usage

Superior/WSP proposes this ATC will be used on I-20 mainline pavement replacement areas. Bridge decks and approach slabs will be excluded.

D. Contract Changes

Volume 2 Technical Provisions, Table 11-1: Pavement Designs provides pavement designs for the project. Superior requests, with this ATC to rubblize the existing concrete pavement and utilize as aggregate base, profile, and compact as necessary with graded aggregate base, place 175 HMA surface type C interlayer and construct 12 inches of Plain PC Concrete Pavement with 1.5 inch dowels.
E. Justification

Rubbolization will reduce the overall roadway construction schedule, impacts to the traveling public, and impacts to the environment by lessening haul trucks on the road. Trucking for slab and existing base disposal will be eliminated. Likewise, this will significantly reduce trucks from entering the work zone with new base material. This will provide a safer work zone for the traveling public and construction crews as well. This method is a proven, complete in place recycle that will provide the same level of quality in an expedited delivery time, and saves overall project cost. Use of the concrete pavement rubblization significantly reduces the construction materials needed, thus reducing costs and construction duration.

F. Impacts

Concrete pavement rubblization reduces construction duration which benefits SCDOT, other stakeholders and the traveling public in several ways: reduces user delays, benefits the local environment from less demolition waste disposal, and reduces vehicle emissions from both construction vehicles and the traveling public. Communities benefit from reduced noise and dust, and elimination of the concrete and base removal improves safety for the traveling public with fewer potential conflicts with construction vehicles. Use of the concrete pavement rubblization significantly reduces the construction materials needed, thus reducing cost and construction duration.

G. Cost Savings

The use of the proposed ATC has the potential to reduce construction costs by approximately $1,200,000. This is based on the reduction of graded aggregate base.

H. Time Savings

The use of the proposed ATC will allow roadway construction to be completed more efficiently. We anticipate saving approximately two months on the roadway construction schedule.

I. Risks

Superior does not foresee any added risk to SCDOT or other entities associated with implementation of this ATC. Reducing the overall duration of the roadway construction elements limits impacts and disruptions to the traveling public, thereby, minimizing the risks associated with this ATC. In areas where concrete pavement rubblization is used, the risk associated with having finished subgrade exposed to the elements and moisture prior to the asphalt interlayer is nearly eliminated.

J. Quality

Arkansas has used concrete pavement rubblization successfully on a number of major interstate reconstruction projects. Agencies like Alabama, Arkansas, Pennsylvania, and Michigan Departments of Transportation consider rubblization one of their primary rehabilitation strategies for rigid pavements on heavily traveled roadways. The Wisconsin Department of Transportation and Federal Highway Administration (FHWA) funded research through the Wisconsin Highway Research Program for “Guidance, Parameters, and Recommendations for Rubblized Pavements,” SPR# 0092-05-07, dated January 2007 and Portland Cement Concrete Pavement over Rubblized PCC, SPR# 0092-00-11, dated March 2008.

K. Costs

No additional costs associated with the approval and implementation of this proposed ATC have been identified for SCDOT or other stakeholders.
I-20 at Savannah River Bridge Replacements and Roadway Widening Project

Alternative Technical Concept

L. Operations

As described above, rubblization of the existing concrete pavement will eliminate existing slab and base course removal on I-20, as well as import of new aggregate base. The rubblization will result in converting the existing concrete pavement into an aggregate base. The base will be brought to design profile by compacted graded aggregate base and then construction of the asphalt interlayer and new 12-inch Plain PC concrete.

M. Maintenance

No change

N. Anticipated Life

No change

O. Right-of-Way

No Right-of-Way required for this ATC.

P. Past Use


Q. Sale of Work Product

We are prepared to sell this ATC to SCDOT and GDOT in accordance with the terms of Section 3.8 of the RFP.
Responses to GDOT request for additional information (Item 5 Geotechnical comments):

a) Page 1 – Description – Provide clarification on the text, “Localized depressions will be filled with graded aggregate base and brought to design grade and compacted.” Acknowledge and accept the following:

i. Placement and compaction of thin lifts of GABC is not acceptable. Leveling with HMA will be required.

*Response:* We acknowledge that placement and compaction of thin lifts of GAB is not acceptable. GAB will only be used in areas where leveling is greater than 1” thick. Areas where leveling and compaction is required that is less than 1” thick, we will use HMA. If SCDOT/GDOT proposes a different threshold than the 1” thickness, please identify in this ATC response.

ii. Filling very small areas (localized depressions) may be acceptable, but general grading is not.

*Response:* We acknowledge filing very small areas (localized depressions) may be acceptable, but not general grading is not. We propose to use GAB to level areas greater than 1” thick. Areas where leveling and compaction is required that is less than 1” thick, we will use HMA. If SCDOT/GDOT proposes a different threshold than the 1” thickness, please identify in this ATC response.

b) Page 1 – Description – Provide a specification detailing the proposed requirements for construction, sampling and testing, and acceptance. Acknowledge and accept that a pavement design modification is required.

*Response:* See attached Specification.
FORM P

ATC Checklist

The DB Team shall check mark in the appropriate box for each item. Any box left incomplete will require a resubmittal of the ATC. If "Change Required" box is checked, the DB Team shall provide a description of the change or deviation from the NEPA Approval, Technical Provisions (Volume 2, Volume 3 and their respective attachments), Technical Documents (Volume 3, Attachment 3-1), and the DBA Volume 1 requirements.

[See following pages]
## NEPA Study Impacts

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**June 14, 2018**

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30X.01

Section 30X. RUBBLIZING PORTLAND CEMENT CONCRETE PAVEMENT

30X.01. Description.

This work consists of preparing, shattering, compacting reinforced or non-reinforced Portland Cement Concrete (PCC) pavement to provide a rubblized base, and disposing of excess and deleterious material.

30X.02. Materials.

Provide material in accordance with the following:

Dense-Graded Aggregate ............................................................. 305

30X.03. Construction.

A. Equipment

Use an Engineer-approved water system to suppress dust generated from pavement shattering operations.

For rubblizing pavement, use:

1. Multiple impact hammer equipment, capable of lifting and falling in an independent, adjustable, random sequence with variable force of impact.

If using impact hammer equipment, the number and spacing of hammers may vary. Ensure the weights of individual hammers do not destroy the integrity of layers within 24 inches below the rubblized pavement.

B. Preparation Work

Before beginning pavement rubblizing, complete all of the following:

Saw cut a relief joint full depth where rubblizing abuts concrete pavement required to remain or will be rubblized in a later stage.
Match the elevation of pavement widening or shoulders to the adjacent pavement requiring rubblizing.

Complete construction of drainage systems, if required, for the new pavement structures, including outlet endings. Backfill and compact to the existing grade to prevent damage to the drainage system.

Remove pavement shown on the plans or directed by the Engineer, over utilities or pipes with less than 18 inches of granular material cover, as measured from the bottom of the pavement to the top of the utility or pipe. Extend the limits for pavement removal 3 feet beyond each side of utility or pipe. Backfill the removal area with filler aggregate, in layers no greater than 6 inches, and compact.

Remove loose patching material before rubblizing, as directed by the Engineer. Do not fill voids before rubblizing.

30X.03

C. Quality Control Checks

Perform all of the following field checks and provide same day documentation of field checks to the Engineer:

1. At the start and during rubblizing operations, establish, demonstrate, and document equipment capabilities, including the speed and impact frequency.

2. At least once per lane, and every 1,500 feet, inspect the rubblized pavement to determine if the rubblizing operation has de-bonded the reinforcement from the concrete and is achieving the particle size specified in subsection 30X.03.F. Mechanically excavate two areas of 9 square feet minimum each during the first half day through the full depth of the pavement, taking care not to further rubblize. Location of the check will be determined by the Engineer. Notify the Engineer at least 2 hours before excavation to allow verification of results for acceptance.
3. If the Engineer directs, perform spot inspections to the top of reinforcement, using manual methods. Considerable physical effort must be expended to inspect rubblized material by manual excavation. Use a shovel or pick to excavate an area of 25 square feet. Use a geologist pick or mason hammer to separate the concrete pieces above the reinforcing mat. Remove as much material as possible and clean the remaining surface with a stiff bristled broom or brush to expose the reinforcing mat. The Department considers the mat de-bonded if at least 80 percent of the mat is visible after excavation and sweeping.

If performing inspection using manual methods, sound concrete below the reinforcing mat to determine if material is fractured.

Restore inspection sites with filler aggregate and compact. The Engineer may adjust the inspection frequency.

4. Ensure the completed rubblized surface has a uniform appearance with no unbroken strips of pavement, exposed reinforcement, or visible joint filler and Hot Mix Asphalt (HMA) patching material.

**D. Compaction**

Before placing the HMA mixture, compact the rubblized pavement with vibratory steel-wheeled and pneumatic-tired rollers in the following sequence:

1. At least two passes with a Z-grid vibratory roller, or steel drum roller, as approved by the Engineer;

2. A third pass, and subsequent passes, with a pneumatic-tired roller; and

3. A final pass just before HMA placement with a pneumatic-tired roller.

A roller pass is defined as down and back in the same path. Provide rollers with a nominal gross weight of at least 10 ton. Operate vibratory
rollers in a high vibration mode and at a speed no greater than 6 feet per second, unless otherwise limited by the condition of the base, subbase, subgrade, or drainage features.

The Contractor may apply water if the Engineer approves. Avoid rehydrating cementitious materials.

After compaction and before placing HMA, ensure the finished surface varies no more than ±1 inch, when tested with a 10-foot straightedge. Fill voids and depressions with filler aggregate and compact.

E. Miscellaneous. Do not allow vehicular traffic on the rubblized pavement before HMA placement, unless otherwise required for construction and maintenance of traffic, as approved by the Engineer. Maintain the compaction of portions of the rubblized pavement, with no exposed reinforcement, for crossroad or ramp traffic.

In part-width construction areas, rubblize the pavement to the limits of the required overlay for that stage. Saw cut the longitudinal joint deep enough to cut the tie bar, unless rubblizing extends beyond the centerline and past the tie bar.

Avoid damaging items required to remain, including drainage structures and monument boxes.

F. Acceptance Criteria

The Engineer will observe quality control checks described in subsection 30X.03.C and base acceptance on the following criteria:

1. PCC pavement shattered to full-depth;
2. Break concrete uniformly across the pavement width into particles that have a maximum dimension less than or equal to 12 inches. Also, 75 percent of the particles, as the engineer determines visually, must have a maximum dimension less than or equal to the following:
   - In the bottom half of the slab; 9 inches.
   - In the top half of the slab; 3 inches.
- At the surface of the slab; 2 inches.
3. No oversized particles at the surface for PCC pavements;
4. De-bonding of reinforced pavement achieved, if the required particle size is met;

5. Exposed reinforcement has been cut off below the surface and removed. Embedded reinforcement may remain in place;

6. No visible joint sealant or HMA patching material on the compacted surface and voids filled with filler aggregate;

7. Joints, and cracks greater than ¼ inch wide at the surface not distinguishable; and
8. No displacement of underlying base, subgrade, or underdrains.

**30X.04. Measurement and Payment.**

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<td>Aggregate, Filler</td>
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<tr>
<td>Saw Cut, Rubblize</td>
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**A. Rubblized Pavement**

The unit price for **Pavement, Rubblize** includes the cost of the following:

1. Required quality control work;
2. Rubblizing;
3. Dust suppression, including water;
4. Removing joint fillers and patching material;
5. Cutting exposed steel, loading, hauling, and disposing of the steel and immediate restoration of disturbed rubblized concrete;
6. Breaking down or removing and disposing of oversized pavement pieces;
7. Disposing of material removed from inspection areas; and

8. Maintaining the condition of the rubblized pavement until placement of the HMA pavement.

B. **Filler Aggregate.** The unit price for *Aggregate, Filler* includes the cost of producing, delivering, placing, leveling, and compacting the aggregate in rubblized pavement.

C. **Saw Cut, Rubblize.** The unit price for *Saw Cut, Rubblize* includes the cost of cutting a relief joint full depth where the rubblizing abuts concrete pavement, required to remain, or removed for other purposes, and cutting the longitudinal joint where necessary.
August 30, 2018

Superior Construction Co, Inc.
Attention: Mr. David Nardon
7072 Business Park Boulevard North
Jacksonville, FL 32256

RE: ATC SWSP-003
I-20 at Savannah River Bridge Replacement Design-Build Project

Dear Mr. Nardon:

The Georgia Department of Transportation has completed review of the above mentioned ATC and provides the following response:

- [X] The ATC, as submitted, is acceptable for inclusion in the Proposal.

- [ ] The ATC is not acceptable for inclusion in the Proposal.

- [ ] The ATC is not acceptable in its present form, but may be acceptable upon the satisfaction, in GDOT's sole discretion, of certain identified conditions which must be met or clarifications or modifications that must be made, including, but not limited to, any required environmental reevaluation related to the ATC, which GDOT may condition upon a GDOT Re-evaluation Period.

- [ ] The submittal does not qualify as an ATC but may be included in Proposer's Proposal because it appears to be within the requirements of the RFP.

- [ ] The submittal does not qualify as an ATC and may not be included in the Proposal.

Please see the attached comments that were generated relative to the decision provided above.
If an ATC is resubmitted, the resubmission shall be provided with the same three-digit number with an alpha numeric letter starting with the letter “A” for the first resubmittal and “B” for a second submittal, etc., and the resubmittal shall address all comments for re-review.

The Georgia Department of Transportation appreciates the effort by your team to provide innovation and improve the overall success of the I-20 at Savannah River Bridge Replacement Design-Build Project.

Sincerely,

Darryl D. VanMeter, P.E.
Assistant P3 Division Director/
State Innovative Delivery Administrator

Attachment: ATC Review Form

CC: Chip Meeks, Procurement Officer
General Files
CONFIDENTIAL

ATC Review Form

1. General comments:
   a. All design criteria and submittals are subject to GDOT review and acceptance after award of the Project.

2. Environmental comments:
   a. No comment

3. Utilities comments:
   a. No comment

4. Right of Way comments:
   a. No comment

5. Geotechnical comments:
   a. No comment

6. Roadway comments:
   a. No comment

7. Drainage/Erosion Control comments:
   a. No comment

8. Bridges/Structures comments:
   a. Details were provided from NYDOT indicating the use of W sections. This ATC is acceptable provided that the depth of steel diaphragm shall be at least 1/2 the depth of the largest connecting girder.

9. ITS comments:
   a. No comment

10. Signing and Marking comments:
    a. No comment

11. Other
    a. No comment
A. **Alternative Technical Concept 3**  

**Concrete Edge Beam Modification - Steel End Diaphragms at ends of Concrete Beams ATCs**

B. **Description**

Provide a galvanized steel end diaphragm at the ends of pre-stressed concrete beams at open deck expansion joint and continuous deck locations at interior bents. This detail will replace the edge beam detail shown on GADOT Bridge Cell. The top chord of the steel cross frame system in both cases will be composite with the concrete deck and attached to a bent plate or angle which in turn will be bolted to the web of the precast concrete beam. Sketch SK001 attached as part of this ATC.

C. **Usage**  

This ATC will be use for the proposed I-20 bridge over the Savannah River.

D. **Contract Changes**

No design exceptions are required for implementation of this ATC. A design change will be required as this ATC replaces the “Edge Beam Detail” currently shown in the GADOT standard bridge for use with pre-stressed concrete beams.

E. **Justification**

The steel end diaphragm as proposed will improve the tight construction schedule. To maintain the department’s commitment requirement for end diaphragm at beam ends, a truss element consisting of steel members will be provided that meets the project requirement.

The proposed detail is currently a standard and has been used successfully on Bulb-tees or AASHTO beam bridges in New York, see insert below from New York State 2017 Standard Bridge Manual, section 9.2.3.
“Contract plans shall show galvanized steel diaphragms. If concrete diaphragms are required due to site specific conditions, DCES approval is necessary. Contact the NYSDOT Concrete Engineering Unit for concrete diaphragm details.”

F. Impacts

No impact to environmental, community or safety have been identified with this ATC. Maintenance operation is an added benefit by this ATC, as easier access to beam bearing pads is provided during routine inspection of the bridge.

G. Cost Savings

Cost savings will be realized through the potential shorter construction time frame.

H. Time Savings

Time saving will be realized through the reduction of time required to construct the project.

I. Risks

This ATC reduces the risk to the project. Implementing this ATC will reduce the construction schedule thereby reducing the risk associated in completing the project in the time specified per the RFP.

J. Quality

This ATC does not reduce the quality and/or performance of the project.

K. Costs

No additional costs associated with the approval and implementation of this proposed ATC have been identified for GDOT or other stakeholders.

L. Operations

No change to operations have been identified.

M. Maintenance

No change to maintenance requirements have been identified. Implementation of this ATC will provide easier access to bearing pads during routine inspection of the bridge.

N. Anticipated Life

No change to anticipated life have been identified. All steel components will be galvanized.

O. Right-of-Way

No additional or change to right-of-way is required.

P. Past Use

New York state uses galvanized steel end diaphragm at the ends of Bulb-tees or AASHTO concrete beams, see attached detail.
Q. Sale of Work Product

The proposer is prepared to sell this ATC as part of the Work Product to GDOT in accordance with Section 3.8.
FORM P

ATC Checklist

The DB Team shall check mark in the appropriate box for each item. Any box left incomplete will require a resubmittal of the ATC. If "Change Required" box is checked, the DB Team shall provide a description of the change or deviation from the NEPA Approval, Technical Provisions (Volume 2, Volume 3 and their respective attachments), Technical Documents (Volume 3, Attachment 3-1), and the DBA Volume 1 requirements.

[See following pages]
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**Volume 3, Attachment 3-1 (list any Manuals which require changes including section number)**

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EXHIBIT 5

RESERVED
# EXHIBIT 8

## FEDERAL REQUIREMENTS

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ATTACHMENT 1 TO EXHIBIT 8

FEDERAL REQUIREMENTS FOR FEDERAL-AID CONSTRUCTION FACILITIES

GENERAL. — The work herein proposed will be financed in whole or in part with federal funds, and therefore all of the statutes, rules and regulations promulgated by the federal government and applicable to work financed in whole or in part with federal funds will apply to such work. The “Required Contract Provisions, Federal-Aid Construction Contracts, Form FHWA-1273,” are included in this Exhibit 8. Whenever in said required contract provisions references are made to:

(a) “SHA contracting officer,” “SHA resident engineer,” or “authorized representative of the SHA,” such references shall be construed to mean GDOT or its Authorized Representative;

(b) “contractor,” “prime contractor,” “bidder” or “prospective primary participant,” such references shall be construed to mean Design-Build Team or its authorized representative and/or the Design-Build Contractor or its authorized representative, as may be appropriate under the circumstances;

(c) “contract” or “prime contract,” such references shall be construed to mean the Design-Build Agreement;

(d) “subcontractor,” “supplier,” “vendor,” “prospective lower tier participant” or “lower tier subcontractor,” such references shall be construed to mean, as appropriate, Contractors other than the Design-Build Contractor; and

(e) “department,” “agency” or “department or agency entering into this transaction,” such references shall be construed to mean GDOT, except where a different department or agency is specified.

PERFORMANCE OF PREVIOUS CONTRACT. — In addition to the provisions in Section II, “NONDISCRIMINATION,” and Section VI, “SUBLETTING OR ASSIGNING THE CONTRACT,” of the Form FHWA-1273 required contract provisions, Design-Build Team shall cause the contractor to comply with the following:

The bidder shall execute the CERTIFICATION WITH REGARD TO THE PERFORMANCE OF PREVIOUS CONTRACTS OR SUBCONTRACTS SUBJECT TO THE EQUAL OPPORTUNITY CLAUSE AND THE FILING OF REQUIRED REPORTS located in the proposal. No request for subletting or assigning any portion of the contract in excess of $10,000 will be considered under the provisions of Section VI of the required contract provisions unless such request is accompanied by the CERTIFICATION referred to above, executed by the proposed subcontractor.

NON-COLLUSION PROVISION. — The provisions in this section are applicable to all contracts except contracts for Federal Aid Secondary Projects. Title 23, United States Code, Section 112, requires as a condition precedent to approval by the Federal Highway Administrator of the contract for this work that each bidder file a sworn statement executed by, or on behalf of, the person, firm, association, or corporation to whom such contract is to be awarded, certifying that such person, firm, association, or corporation has not, either directly or indirectly, entered into any agreement, participated in any collusion, or otherwise taken any action in restraint of free competitive bidding in connection with the submitted bid. A form to make the non-collusion

PARTICIPATION BY DISADVANTAGED BUSINESS ENTERPRISES IN SUBCONTRACTING. — Part 26, Title 49, Code of Federal Regulations applies to this Project. Pertinent sections of said Code are incorporated within other articles or sections of the Agreement and any other Contract and the GDOT Disadvantaged Business Enterprise Program adopted pursuant to 49 CFR Part 26.

CONVICT PRODUCED MATERIALS

a. FHWA Federal-aid projects are subject to 23 C.F.R. § 635.417, Convict produced materials.

b. Materials produced after July 1, 1991, by convict labor may only be incorporated in a Federal aid highway construction project if such materials have been: (i) produced by convicts who are on parole, supervised release, or probation from a prison, or (ii) produced in a prison project in which convicts, during the 12 month period ending July 1, 1987, produced materials for use in Federal aid highway construction projects, and the cumulative annual production amount of such materials for use in Federal aid highway construction does not exceed the amount of such materials produced in such project for use in Federal aid highway construction during the 12 month period ending July 1, 1987.

ACCESS TO RECORDS

a. As required by 49 C.F.R. 18.36(i)(10), Design-Build Team and its Contractors shall allow FHWA and the Comptroller General of the United States, or their duly authorized representatives, access to all books, documents, papers, and records of Design-Build Team and Contractors which are directly pertinent to any grantee or subgrantee contract, for the purpose of making audit, examination, excerpts, and transcriptions thereof. In addition, as required by 49 C.F.R. 18.36(i)(11), Design-Build Team and its Contractors shall retain all such books, documents, papers, and records for three years after final payment is made pursuant to any such contract and all other pending matters are closed.

b. Design-Build Team agrees to include this section in each Contract at each tier, without modification except as appropriate to identify the Contractor who will be subject to its provisions.
REQUIRED CONTRACT PROVISIONS

FEDERAL-AID CONSTRUCTION CONTRACTS

I. GENERAL

1. Form FHWA-1273 must be physically incorporated in each construction contract funded under Title 23 (excluding emergency contracts solely intended for debris removal). The contractor (or subcontractor) must insert this form in each subcontract and further require its inclusion in all lower tier subcontracts (excluding purchase orders, rental agreements and other agreements for supplies or services).

The applicable requirements of Form FHWA-1273 are incorporated by reference for work done under any purchase order, rental agreement or agreement for other services. The prime contractor shall be responsible for compliance by any subcontractor, lower-tier subcontractor or service provider.

Form FHWA-1273 must be included in all federal-aid design-build contracts, in all subcontracts and in lower tier subcontracts (excluding subcontracts for design services, purchase orders, rental agreements and other agreements for supplies or services). The design-builder shall be responsible for compliance by any subcontractor, lower-tier subcontractor or service provider.

Contracting agencies may reference Form FHWA-1273 in bid proposal or request for proposal documents; however, the Form FHWA-1273 must be physically incorporated (not referenced) in all contracts, subcontracts and lower-tier subcontracts (excluding purchase orders, rental agreements and other agreements for supplies or services related to a construction contract).

2. Subject to the applicability criteria noted in the following sections, these contract provisions shall apply to all work performed on the contract by the contractor's own organization and with the assistance of workers under the contractor's immediate supervision and to all work performed on the contract by piecework, station work, or by subcontract.

3. A breach of any of the stipulations contained in these Required Contract Provisions may be sufficient grounds for withholding of progress payments, withholding of final payment, termination of the contract, suspension / debarment or any other action determined to be appropriate by the contracting agency and FHWA.

4. Selection of Labor: During the performance of this contract, the contractor shall not use convict labor for any purpose within the limits of a construction project on a Federal-aid highway unless it is labor performed by convicts who are on parole, supervised release, or probation. The term Federal-aid highway does not include roadways functionally classified as local roads or rural minor collectors.

II. NONDISCRIMINATION

The provisions of this section related to 23 CFR Part 230 are applicable to all Federal-aid construction contracts and to all related construction subcontracts of $10,000 or more. The provisions of 23 CFR Part 230 are not applicable to material supply, engineering, or architectural service contracts.

In addition, the contractor and all subcontractors must comply with the following policies: Executive Order 11246, 41 CFR 60, 29 CFR 1625-1627, Title 23 USC Section 140, the Rehabilitation Act of 1973, as amended (29 USC 794), Title VI of the Civil Rights Act of 1964, as amended, and related regulations including 49 CFR Parts 21, 26 and 27; and 23 CFR Parts 200, 230, and 633.

The contractor and all subcontractors must comply with: the requirements of the Equal Opportunity Clause in 41 CFR 60-1.4(b) and, for all construction contracts exceeding $10,000, the Standard Federal Equal Employment Opportunity Construction Contract Specifications in 41 CFR 60-4.3.

Note: The U.S. Department of Labor has exclusive authority to determine compliance with Executive Order 11246 and the policies of the Secretary of Labor including 41 CFR 60, and 29 CFR 1625-1627. The contracting agency and the FHWA have the authority and the responsibility to ensure compliance with Title 23 USC Section 140, the Rehabilitation Act of 1973, as amended (29 USC 794), and Title VI of the Civil Rights Act of 1964, as amended, and related regulations including 49 CFR Parts 21, 26 and 27; and 23 CFR Parts 200, 230, and 633.
The following provision is adopted from 23 CFR 230, Appendix A, with appropriate revisions to conform to the U.S. Department of Labor (US DOL) and FHWA requirements.

1. Equal Employment Opportunity: Equal employment opportunity (EEO) requirements not to discriminate and to take affirmative action to assure equal opportunity as set forth under laws, executive orders, rules, regulations (28 CFR 35, 29 CFR 1630, 29 CFR 1625-1627, 41 CFR 60 and 49 CFR 27) and orders of the Secretary of Labor as modified by the provisions prescribed herein, and imposed pursuant to 23 U.S.C. 140 shall constitute the EEO and specific affirmative action standards for the contractor's project activities under this contract. The provisions of the Americans with Disabilities Act of 1990 (42 U.S.C. 12101 et seq.) set forth under 28 CFR 35 and 29 CFR 1630 are incorporated by reference in this contract. In the execution of this contract, the contractor agrees to comply with the following minimum specific requirements of EEO:

a. The contractor will work with the contracting agency and the Federal Government to ensure that it has made every good faith effort to provide equal opportunity with respect to all of its terms and conditions of employment and in their review of activities under the contract.

b. The contractor will accept as its operating policy the following statement:

"It is the policy of this Company to assure that applicants are employed, and that employees are treated during employment, without regard to their race, religion, sex, color, national origin, age or disability. Such action shall include: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship, pre-apprenticeship, and on-the-job training."

2. EEO Officer: The contractor will designate and make known to the contracting officers an EEO Officer who will have the responsibility for and must be capable of effectively administering and promoting an active EEO program and to whom all of its terms and conditions of employment and in their review of activities under the contract.

3. Dissemination of Policy: All members of the contractor's staff who are authorized to hire, supervise, promote, and discharge employees, or who recommend such action, or who are substantially involved in such action, will be made fully cognizant of, and will implement, the contractor's EEO policy and contractual responsibilities to provide EEO in each grade and classification of employment. To ensure that the above agreement will be met, the following actions will be taken as a minimum:

a. Periodic meetings of supervisory and personnel officers employed will be conducted before the start of work and then not less often than once every six months, at which time the contractor's EEO policy and its implementation will be reviewed and explained. The meetings will be conducted by the EEO Officer.

b. All new supervisory or personnel office employees will be given a thorough indoctrination by the EEO Officer, covering all major aspects of the contractor's EEO obligations within thirty days following their hiring for duty with the contractor.

c. All personnel who are engaged in direct recruitment for the project will be instructed by the EEO Officer in the contractor's procedures for locating and hiring minorities and women.

d. Notices and posters setting forth the contractor's EEO policy will be placed in areas readily accessible to employees, applicants for employment and potential employees.

e. The contractor's EEO policy and the procedures to implement such policy will be brought to the attention of employees by means of meetings, employee handbooks, or other appropriate means.

4. Recruitment: When advertising for employees, the contractor will include in all advertisements for employees the notation: "An Equal Opportunity Employer." All such advertisements will be placed in publications having a large circulation among minorities and women in the area from which the project workforce would normally be derived.

a. The contractor will, unless precluded by a valid bargaining agreement, conduct systematic and direct recruitment through public and private employee referral sources likely to yield qualified minorities and women. To meet this requirement, the contractor will identify sources of potential minority group employees, and establish with such identified sources procedures whereby minority and women applicants may be referred to the contractor for employment consideration.

b. In the event the contractor has a valid bargaining agreement providing for exclusive hiring hall referrals, the contractor is expected to observe the provisions of that agreement to the extent that the system meets the contractor's compliance with EEO contract provisions. Where implementation of such an agreement has the effect of discriminating against minorities or women, or obligates the contractor to do the same, such implementation violates Federal nondiscrimination provisions.

c. The contractor will encourage its present employees to refer minorities and women as applicants for employment. Information and procedures with regard to referring such applicants will be discussed with employees.

5. Personnel Actions: Wages, working conditions, and employee benefits shall be established and administered, and personnel actions of every type, including hiring, upgrading, promotion, transfer, demotion, layoff, and termination, shall be taken without regard to race, color, religion, sex, national origin, age or disability. The following procedures shall be followed:

a. The contractor will conduct periodic inspections of project sites to ensure that working conditions and employee facilities do not indicate discriminatory treatment of project site personnel.

b. The contractor will periodically evaluate the spread of wages paid within each classification to determine any evidence of discriminatory wage practices.

c. The contractor will periodically review selected personnel actions in depth to determine whether there is evidence of discrimination. Where evidence is found, the contractor will promptly take corrective action. If the review indicates that the discrimination may extend beyond the actions reviewed, such corrective action shall include all affected persons.
d. The contractor will promptly investigate all complaints of alleged discrimination made to the contractor in connection with its obligations under this contract, will attempt to resolve such complaints, and will take appropriate corrective action within a reasonable time. If the investigation indicates that the discrimination may affect persons other than the complainant, such corrective action shall include such other persons. Upon completion of each investigation, the contractor will inform every complainant of all of their avenues of appeal.

6. Training and Promotion:

a. The contractor will assist in locating, qualifying, and increasing the skills of minorities and women who are applicants for employment or current employees. Such efforts should be aimed at developing full journey level status employees in the type of trade or job classification involved.

b. Consistent with the contractor’s work force requirements and as permissible under Federal and State regulations, the contractor shall make full use of training programs, i.e., apprenticeship, and on-the-job training programs for the geographical area of contract performance. In the event a special provision for training is provided under this contract, this subparagraph will be superseded as indicated in the special provision. The contracting agency may reserve training positions for persons who receive welfare assistance in accordance with 23 U.S.C. 140(a).

c. The contractor will advise employees and applicants for employment of available training programs and entrance requirements for each.

d. The contractor will periodically review the training and promotion potential of employees who are minorities and women and will encourage eligible employees to apply for such training and promotion.

7. Unions:
If the contractor relies in whole or in part upon unions as a source of employees, the contractor will use good faith efforts to obtain the cooperation of such unions to increase opportunities for minorities and women. Actions by the contractor, either directly or through a contractor’s association acting as agent, will include the procedures set forth below:

a. The contractor will use good faith efforts to develop, in cooperation with the unions, joint training programs aimed toward qualifying more minorities and women for membership in the unions and increasing the skills of minorities and women so that they may qualify for higher paying employment.

b. The contractor will use good faith efforts to incorporate an EEO clause into each union agreement to the end that such union will be contractually bound to refer applicants without regard to their race, color, religion, sex, national origin, age or disability.

c. The contractor is to obtain information as to the referral practices and policies of the labor union except that to the extent such information is within the exclusive possession of the labor union and such labor union refuses to furnish such information to the contractor, the contractor shall so certify to the contracting agency and shall set forth what efforts have been made to obtain such information.

d. In the event the union is unable to provide the contractor with a reasonable flow of referrals within the time limit set forth in the collective bargaining agreement, the contractor will, through independent recruitment efforts, fill the employment vacancies without regard to race, color, religion, sex, national origin, age or disability; making full efforts to obtain qualified and/or qualifiable minorities and women. The failure of a union to provide sufficient referrals (even though it is obligated to provide exclusive referrals under the terms of a collective bargaining agreement) does not relieve the contractor from the requirements of this paragraph. In the event the union referral practice prevents the contractor from meeting the obligations pursuant to Executive Order 11246, as amended, and these special provisions, such contractor shall immediately notify the contracting agency.

8. Reasonable Accommodation for Applicants / Employees with Disabilities:
The contractor must be familiar with the requirements for and comply with the Americans with Disabilities Act and all rules and regulations established there under. Employers must provide reasonable accommodation in all employment activities unless to do so would cause an undue hardship.

9. Selection of Subcontractors, Procurement of Materials and Leasing of Equipment:
The contractor shall not discriminate on the grounds of race, color, religion, sex, national origin, age or disability in the selection and retention of subcontractors, including procurement of materials and leases of equipment. The contractor shall take all necessary and reasonable steps to ensure nondiscrimination in the administration of this contract.

a. The contractor shall notify all potential subcontractors and suppliers and lessors of their EEO obligations under this contract.

b. The contractor will use good faith efforts to ensure subcontractor compliance with their EEO obligations.

10. Assurance Required by 49 CFR 26.13(b):

a. The requirements of 49 CFR Part 26 and the State DOT’s U.S. DOT-approved DBE program are incorporated by reference.

b. The contractor or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The contractor shall carry out applicable requirements of 49 CFR Part 26 in the award and administration of DOT-assisted contracts. Failure by the contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as the contracting agency deems appropriate.

11. Records and Reports:
The contractor shall keep such records as necessary to document compliance with the EEO requirements. Such records shall be retained for a period of three years following the date of the final payment to the contractor for all contract work and shall be available at reasonable times and places for inspection by authorized representatives of the contracting agency and the FHWA.

a. The records kept by the contractor shall document the following:

(1) The number and work hours of minority and non-minority group members and women employed in each work classification on the project;
(2) The progress and efforts being made in cooperation with unions, when applicable, to increase employment opportunities for minorities and women; and

(3) The progress and efforts being made in locating, hiring, training, qualifying, and upgrading minorities and women;

b. The contractors and subcontractors will submit an annual report to the contracting agency each July for the duration of the project, indicating the number of minority, women, and non-minority group employees currently engaged in each work classification required by the contract work. This information is to be reported on Form FHWA-1391. The staffing data should represent the project workforce on board in all or any part of the last payroll period preceding the end of July. If on-the-job training is being required by special provision, the contractor will be required to collect and report training data. The employment data should reflect the workforce on board during all or any part of the last payroll period preceding the end of July.

III. NONSEGREGATED FACILITIES

This provision is applicable to all Federal-aid construction contracts and to all related construction subcontracts of $10,000 or more.

The contractor must ensure that facilities provided for employees are provided in such a manner that segregation on the basis of race, color, religion, sex, or national origin cannot result. The contractor may either segregate such use by written or oral policies or tolerate such use by employee custom. The contractor's obligation extends further to ensure that its employees are not assigned to perform their services at any location, under the contractor's control, where the facilities are segregated. The term "facilities" includes waiting rooms, work areas, restaurants and other eating areas, time clocks, restrooms, washrooms, locker rooms, and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing provided for employees. The contractor shall provide separate or single-user restrooms and necessary dressing or sleeping areas to assure privacy between sexes.

IV. DAVIS-BACON AND RELATED ACT PROVISIONS

This section is applicable to all Federal-aid construction projects exceeding $2,000 and to all related subcontracts and lower-tier subcontracts (regardless of subcontract size). The requirements apply to all projects located within the right-of-way of a roadway that is functionally classified as Federal-aid highway. This excludes roadways functionally classified as local roads or rural minor collectors, which are exempt. Contracting agencies may elect to apply these requirements to other projects.

The following provisions are from the U.S. Department of Labor regulations in 29 CFR 5.5 "Contract provisions and related matters" with minor revision to conform to the FHWA-1273 format and FHWA program requirements.

1. Minimum wages

   a. All laborers and mechanics employed or working upon the site of the work, will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR part 3)), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor and such laborers and mechanics.

   Contributions made or costs reasonably anticipated for bona fide fringe benefits under section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of paragraph 1.d. of this section; also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in 29 CFR 5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein: Provided, That the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates conforming to those contained in the wage determination of the contractor) due at time

   b. (1) The contracting officer shall require that any class of laborers mechanics, including helpers, which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. The contracting officer shall approve an additional classification and wage rate and fringe benefits therefore only when the following criteria have been met:

      (i) The work to be performed by the classification requested is not performed by a classification in the wage determination; and

      (ii) The classification is utilized in the area by the construction industry; and

      (iii) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

   (2) If the contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and the contracting officer agree on the
classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by the contracting officer to the Administrator of the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor, Washington, DC 20210. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

(3) In the event the contractor, the laborers or mechanics to be employed in the classification or their representatives, and the contracting officer do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the contracting officer shall refer the questions, including the views of all interested parties and the recommendation of the contracting officer, to the Wage and Hour Administrator for determination. The Wage and Hour Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

(4) The wage rate (including fringe benefits where appropriate) determined pursuant to paragraphs 1.b.(2) or 1.b.(3) of this section, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

c. Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.

d. If the contractor does not make payments to a trustee or other third person, the contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, Provided, That the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

2. Withholding

The contracting agency shall upon its own action or upon written request of an authorized representative of the Department of Labor, withhold or cause to be withheld from the contractor under this contract, or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime contractor, so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of the work, all or part of the wages required by the contract, the contracting agency may, after written notice to the contractor, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

3. Payrolls and basic records

a. Payrolls and basic records relating thereto shall be maintained by the contractor during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work. Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in section 1(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR 5.5(a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in section 1(b)(2)(B) of the Davis-Bacon Act, the contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees and the ratios and wage rates prescribed in the applicable programs.

b. (1) The contractor shall submit weekly for each week in which any contract work is performed a copy of all payrolls to the contracting agency. The payrolls submitted shall set out accurately and completely all of the information required to be maintained under 29 CFR 5.5(a)(3)(i), except that full social security numbers and home addresses shall not be included on weekly transmittals. Instead the payrolls shall only need to include an individually identifying number for each employee (e.g., the last four digits of the employee's social security number). The required weekly payroll information may be submitted in any form desired. Optional Form WH–347 is available for this purpose from the Wage and Hour Division Web site at http://www.dol.gov/whd/forms/wh347instr.htm or its successor site. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors. Contractors and subcontractors shall maintain the full social security number and current address of each covered worker, and shall provide them upon request to the contracting agency for transmission to the State DOT, the FHWA or the...
Wage and Hour Division of the Department of Labor for purposes of an investigation or audit of compliance with prevailing wage requirements. It is not a violation of this section for a prime contractor to require a subcontractor to provide addresses and social security numbers to the prime contractor for its own records, without weekly submission to the contracting agency.

(2) Each payroll submitted shall be accompanied by a “Statement of Compliance,” signed by the contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:

(i) That the payroll for the payroll period contains the information required to be provided under §5.5(a)(3)(i) of Regulations 29 CFR part 5, the appropriate information is being maintained under §5.5(a)(3)(ii) of Regulations 29 CFR part 5, and that such information is correct and complete;

(ii) That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in Regulations 29 CFR part 3;

(iii) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.

(3) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the “Statement of Compliance” required by paragraph 3.b.(2) of this section.

(4) The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal prosecution under section 1001 of title 18 and section 231 of title 31 of the United States Code.

c. The contractor or subcontractor shall make the records required under paragraph 3.a. of this section available for inspection, copying, or transcription by authorized representatives of the contracting agency, the State DOT, the FHWA, or the Department of Labor, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, the FHWA may, after written notice to the contractor, the contracting agency or the State DOT, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

4. Apprentices and trainees

a. Apprentices (programs of the USDOL).

Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship Training, Employer and Labor Services, or with a State Apprenticeship Agency recognized by the Office, or, if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Office of Apprenticeship Training, Employer and Labor Services or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice.

The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the contractor's or subcontractor's registered program shall be observed.

Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeyman's hourly rate. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringe benefits shall be paid in accordance with that determination.

In the event the Office of Apprenticeship Training, Employer and Labor Services, or a State Apprenticeship Agency recognizes the Office, withdraws approval of an apprenticeship program, the contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.
b. Trainees (programs of the USDOL).

Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration.

The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration.

Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed.

In the event the Employment and Training Administration withdraws approval of a training program, the contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

c. Equal employment opportunity. The utilization of apprentices, trainees and journeymen under this part shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR part 30.

d. Apprentices and Trainees (programs of the U.S. DOT).

Apprentices and trainees working under apprenticeship and skill training programs which have been certified by the Secretary of Transportation as promoting EEO in connection with Federal-aid highway construction programs are not subject to the requirements of paragraph 4 of this Section IV. The straight time hourly wage rates for apprentices and trainees under such programs will be established by the particular programs. The ratio of apprentices and trainees to journeymen shall not be greater than permitted by the terms of the particular program.

5. Compliance with Copeland Act requirements. The contractor shall comply with the requirements of 29 CFR part 3, which are incorporated by reference in this contract.

6. Subcontracts. The contractor or subcontractor shall insert Form FHWA-1273 in any subcontracts and also require the subcontractors to include Form FHWA-1273 in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in 29 CFR 5.5.

7. Contract termination: debarment. A breach of the contract clauses in 29 CFR 5.5 may be grounds for termination of the contract, and for debarment as a contractor and a subcontractor as provided in 29 CFR 5.12.

8. Compliance with Davis-Bacon and Related Act requirements. All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR parts 1, 3, and 5 are herein incorporated by reference in this contract.

9. Disputes concerning labor standards. Disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and the contracting agency, the U.S. Department of Labor, or the employees or their representatives.

10. Certification of eligibility.

a. By entering into this contract, the contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

b. No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).


V. CONTRACT WORK HOURS AND SAFETY STANDARDS ACT

The following clauses apply to any Federal-aid construction contract in an amount in excess of $100,000 and subject to the overtime provisions of the Contract Work Hours and Safety Standards Act. These clauses shall be inserted in addition to the clauses required by 29 CFR 5.5(a) or 29 CFR 4.6. As used in this paragraph, the terms laborers and mechanics include watchmen and guards.
1. **Overtime requirements.** No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.

2. **Violation; liability for unpaid wages; liquidated damages.** In the event of any violation of the clause set forth in paragraph (1) of this section, the contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (1) of this section, in the sum of $10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (1) of this section.

3. **Withholding for unpaid wages and liquidated damages.** The FHWA or the contacting agency shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract, any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (2) of this section.

4. **Subcontracts.** The contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraph (1) through (4) of this section and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (1) through (4) of this section.

### VI. SUBLETTING OR ASSIGNING THE CONTRACT

This provision is applicable to all Federal-aid construction contracts on the National Highway System.

1. The contractor shall perform with its own organization contract work amounting to not less than 30 percent (or a greater percentage if specified elsewhere in the contract) of the total original contract price, excluding any specialty items designated by the contracting agency. Specialty items may be performed by subcontract and the amount of any such specialty items performed may be deducted from the total original contract price before computing the amount of work required to be performed by the contractor's own organization (23 CFR 635.116).

   a. The term "perform work with its own organization" refers to workers employed or leased by the prime contractor, and equipment owned or rented by the prime contractor, with or without operators. Such term does not include employees or equipment of a subcontractor or lower tier subcontractor, agents of the prime contractor, or any other assignees. The term may include payments for the costs of hiring leased employees from an employee leasing firm meeting all relevant Federal and State regulatory requirements. Leased employees may only be included in this term if the prime contractor meets all of the following conditions:

      (1) the prime contractor maintains control over the supervision of the day-to-day activities of the leased employees;

      (2) the prime contractor remains responsible for the quality of the work of the leased employees;

      (3) the prime contractor retains all power to accept or exclude individual employees from work on the project; and

      (4) the prime contractor remains ultimately responsible for the payment of predetermined minimum wages, the submission of payrolls, statements of compliance and all other Federal regulatory requirements.

   b. "Specialty Items" shall be construed to be limited to work that requires highly specialized knowledge, abilities, or equipment not ordinarily available in the type of contracting organizations qualified and expected to bid or propose on the contract as a whole and in general are to be limited to minor components of the overall contract.

2. The contract amount upon which the requirements set forth in paragraph (1) of Section VI is computed includes the cost of material and manufactured products which are to be purchased or produced by the contractor under the contract provisions.

3. The contractor shall furnish (a) a competent superintendent or supervisor who is employed by the firm, has full authority to direct performance of the work in accordance with the contract requirements, and is in charge of all construction operations (regardless of who performs the work) and (b) such other of its own organizational resources (supervision, management, and engineering services) as the contracting officer determines is necessary to assure the performance of the contract.

4. No portion of the contract shall be sublet, assigned or otherwise disposed of except with the written consent of the contracting officer, or authorized representative, and such consent when given shall not be construed to relieve the contractor of any responsibility for the fulfillment of the contract. Written consent will be given only after the contracting agency has assured that each subcontract is evidenced in writing and that it contains all pertinent provisions and requirements of the prime contract.

5. The 30% self-performance requirement of paragraph (1) is not applicable to design-build contracts; however, contracting
agencies may establish their own self-performance requirements.

VII. SAFETY: ACCIDENT PREVENTION
This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

1. In the performance of this contract the contractor shall comply with all applicable Federal, State, and local laws governing safety, health, and sanitation (23 CFR 635). The contractor shall provide all safeguards, safety devices, and protective equipment and take any other needed actions as it determines, or as the contracting officer may determine, to be reasonably necessary to protect the life and health of employees on the job and the safety of the public and to protect property in connection with the performance of the work covered by the contract.

2. It is a condition of this contract, and shall be made a condition of each subcontract, which the contractor enters into pursuant to this contract, that the contractor and any subcontractor shall not permit any employee, in performance of the contract, to work in surroundings or under conditions which are unsanitary, hazardous or dangerous to his/her health or safety, as determined under construction safety and health standards (29 CFR 1926) promulgated by the Secretary of Labor, in accordance with Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 3704).

3. Pursuant to 29 CFR 1926.3, it is a condition of this contract that the Secretary of Labor or authorized representative thereof, shall have right of entry to any site of contract performance to inspect or investigate the matter of compliance with the construction safety and health standards and to carry out the duties of the Secretary under Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 3704).

VIII. FALSE STATEMENTS CONCERNING HIGHWAY PROJECTS
This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

In order to assure high quality and durable construction in conformity with approved plans and specifications and a high degree of reliability on statements and representations made by engineers, contractors, suppliers, and workmen on Federal-aid highway projects, it is essential that all persons concerned with the project perform their functions as carefully, thoroughly, and honestly as possible. Willful falsification, distortion, or misrepresentation with respect to any facts related to the project is a violation of Federal law. To prevent any misunderstanding regarding the seriousness of these and similar acts, Form FHWA-1022 shall be posted on each Federal-aid highway project (23 CFR 635) in one or more places where it is readily available to all persons concerned with the project.

18 U.S.C. 1020 reads as follows:

"Whoever, being an officer, agent, or employee of the United States, or of any State or Territory, or whoever, whether a person, association, firm, or corporation, knowingly makes any false statement, false representation, or false report as to the character, quality, quantity, or cost of the material used or to be used, or the quantity or quality of the work performed or to be performed, or the cost thereof in connection with the submission of plans, maps, specifications, contracts, or costs of construction on any highway or related project submitted for approval to the Secretary of Transportation; or

Whoever knowingly makes any false statement, false representation, false report or false claim with respect to the character, quality, quantity, or cost of any work performed or to be performed, or materials furnished or to be furnished, in connection with the construction of any highway or related project approved by the Secretary of Transportation; or

Whoever knowingly makes any false statement or false representation as to material fact in any statement, certificate, or report submitted pursuant to provisions of the Federal-aid Roads Act approved July 1, 1916, (39 Stat. 355), as amended and supplemented;

Shall be fined under this title or imprisoned not more than 5 years or both."

IX. IMPLEMENTATION OF CLEAN AIR ACT AND FEDERAL WATER POLLUTION CONTROL ACT
This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

By submission of this bid/proposal or the execution of this contract, or subcontract, as appropriate, the bidder, proposer, Federal-aid construction contractor, or subcontractor, as appropriate, will be deemed to have stipulated as follows:

1. That any person who is or will be utilized in the performance of this contract is not prohibited from receiving an award due to a violation of Section 508 of the Clean Water Act or Section 306 of the Clean Air Act.

2. That the contractor agrees to include or cause to be included the requirements of paragraph (1) of this Section X in every subcontract, and further agrees to take such action as the contracting agency may direct as a means of enforcing such requirements.

X. CERTIFICATION REGARDING DEBARMENT, SUSPENSION, INELIGIBILITY AND VOLUNTARY EXCLUSION
This provision is applicable to all Federal-aid construction contracts, design-build contracts, subcontracts, lower-tier subcontracts, purchase orders, lease agreements, consultant contracts or any other covered transaction requiring FHWA approval or that is estimated to cost $25,000 or more — as defined in 2 CFR Parts 180 and 1200.

1. Instructions for Certification - First Tier Participants:
   a. By signing and submitting this proposal, the prospective first-tier participant is providing the certification set out below.
b. The inability of a person to provide the certification set out below will not necessarily result in denial of participation in this covered transaction. The prospective first tier participant shall submit an explanation of why it cannot provide the certification set out below. The certification or explanation will be considered in connection with the department or agency's determination whether to enter into this transaction. However, failure of the prospective first tier participant to furnish a certification or an explanation shall disqualify such a person from participation in this transaction.

c. The certification in this clause is a material representation of fact upon which reliance was placed when the contracting agency determined to enter into this transaction. If it is later determined that the prospective participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the contracting agency may terminate this transaction for cause of default.

d. The prospective first tier participant shall provide immediate written notice to the contracting agency to whom this proposal is submitted if any time the prospective first tier participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.

e. The terms “covered transaction,” “debarred,” “suspended,” “ineligible,” “participant,” “person,” “principle,” and “voluntarily excluded,” as used in this clause, are defined in 2 CFR Parts 180 and 1200. “First Tier Covered Transactions” refers to any covered transaction between a grantee or subgrantee of Federal funds and a participant (such as the prime or general contract). “Lower Tier Covered Transactions” refers to any covered transaction under a First Tier Covered Transaction (such as subcontracts). “First Tier Participant” refers to the participant who has entered into a covered transaction with a grantee or subgrantee of Federal funds (such as the prime or general contractor). “Lower Tier Participant” refers any participant who has entered into a covered transaction with a First Tier Participant or other Lower Tier Participants (such as subcontractors and suppliers).

f. The prospective first tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency entering into this transaction.

g. The prospective first tier participant further agrees by submitting this proposal that it will include the clause titled “Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion—Lower Tier Participants” provided by the department or contracting agency, entering into this covered transaction, without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions exceeding the $25,000 threshold.

h. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the Excluded Parties List System website (https://www.epils.gov/), which is compiled by the General Services Administration.

i. Nothing contained in the foregoing shall be construed to require the establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of the prospective participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

j. Except for transactions authorized under paragraph (f) of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause or default.

2. Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion—First Tier Participants:

a. The prospective first tier participant certifies to the best of its knowledge and belief, that it and its principals:

   (1) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency;

   (2) Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;

   (3) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph (a)(2) of this certification; and

   (4) Have not within a three-year period preceding this application/proposal had one or more public transactions (Federal, State or local) terminated for cause or default.

b. Where the prospective participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

2. Instructions for Certification—Lower Tier Participants:

(Applicable to all subcontracts, purchase orders and other lower tier transactions requiring prior FHWA approval or estimated to cost $25,000 or more - 2 CFR Parts 180 and 1200)

a. By signing and submitting this proposal, the prospective lower tier is providing the certification set out below.
b. The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later determined that the prospective lower tier participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department, or agency with which this transaction originated, it may pursue available remedies, including suspension or debarment.

c. The prospective lower tier participant shall provide immediate written notice to the person to which this proposal is submitted if at any time the prospective lower tier participant learns that its certification was erroneous by reason of changed circumstances.

d. The terms “covered transaction,” “debarred,” “suspended,” “ineligible,” “participant,” “person,” “principal,” and “voluntarily excluded,” as used in this clause, are defined in 2 CFR Parts 180 and 1200. You may contact the person to which this proposal is submitted for assistance in obtaining a copy of those regulations. “First Tier Covered Transactions” refers to any covered transaction between a grantee or subgrantee of Federal funds and a participant (such as the prime or general contractor). “Lower Tier Covered Transactions” refers to any covered transaction under a First Tier Covered Transaction (such as subcontracts). “First Tier Participant” refers to the participant who has entered into a covered transaction with a grantee or subgrantee of Federal funds (such as the prime or general contractor). “Lower Tier Participant” refers any participant who has entered into a covered transaction with a First Tier Participant or other Lower Tier Participants (such as subcontractors and suppliers).

e. The prospective lower tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency with which this transaction originated.

f. The prospective lower tier participant further agrees by submitting this proposal that it will include this clause titled “Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion—Lower Tier Covered Transaction,” without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions exceeding the $25,000 threshold.

g. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the Excluded Parties List System website (https://www.epils.gov/), which is compiled by the General Services Administration.

h. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of participant is not required to exceed which is normally possessed by a prudent person in the ordinary course of business dealings.

i. Except for transactions authorized under paragraph e of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency with which this transaction originated, it may pursue available remedies, including suspension and/or debarment.

* * * * *

Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion—Lower Tier Participants:

1. The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals is presently debarred, suspended, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency.

2. Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

* * * * *

XI. CERTIFICATION REGARDING USE OF CONTRACT FUNDS FOR LOBBYING

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts which exceed $100,000 (49 CFR 20).

1. The prospective participant certifies, by signing and submitting this bid or proposal, to the best of his or her knowledge and belief, that:

   a. No Federal appropriated funds have been paid or will be paid by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

   b. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, “Disclosure Form to Report Lobbying,” in accordance with its instructions.

2. This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by 31 U.S.C. 1352. Any person who fails to file the required
certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

3. The prospective participant also agrees by submitting its bid or proposal that the participant shall require that the language of this certification be included in all lower tier subcontracts, which exceed $100,000 and that all such recipients shall certify and disclose accordingly.
ATTACHMENT A - EMPLOYMENT AND MATERIALS PREFERENCE FOR APPALACHIAN DEVELOPMENT HIGHWAY SYSTEM OR APPALACHIAN LOCAL ACCESS ROAD CONTRACTS

This provision is applicable to all Federal-aid projects funded under the Appalachian Regional Development Act of 1965.

1. During the performance of this contract, the contractor undertaking to do work which is, or reasonably may be, done as on-site work, shall give preference to qualified persons who regularly reside in the labor area as designated by the DOL wherein the contract work is situated, or the subregion, or the Appalachian counties of the State wherein the contract work is situated, except:

   a. To the extent that qualified persons regularly residing in the area are not available.

   b. For the reasonable needs of the contractor to employ supervisory or specially experienced personnel necessary to assure an efficient execution of the contract work.

   c. For the obligation of the contractor to offer employment to present or former employees as the result of a lawful collective bargaining contract, provided that the number of nonresident persons employed under this subparagraph (1c) shall not exceed 20 percent of the total number of employees employed by the contractor on the contract work, except as provided in subparagraph (4) below.

2. The contractor shall place a job order with the State Employment Service indicating (a) the classifications of the laborers, mechanics and other employees required to perform the contract work, (b) the number of employees required in each classification, (c) the date on which the participant estimates such employees will be required, and (d) any other pertinent information required by the State Employment Service to complete the job order form. The job order may be placed with the State Employment Service in writing or by telephone. If during the course of the contract work, the information submitted by the contractor in the original job order is substantially modified, the participant shall promptly notify the State Employment Service.

3. The contractor shall give full consideration to all qualified job applicants referred to him by the State Employment Service. The contractor is not required to grant employment to any job applicants who, in his opinion, are not qualified to perform the classification of work required.

4. If, within one week following the placing of a job order by the contractor with the State Employment Service, the State Employment Service is unable to refer any qualified job applicants to the contractor, or less than the number requested, the State Employment Service will forward a certificate to the contractor indicating the unavailability of applicants. Such certificate shall be made a part of the contractor's permanent project records. Upon receipt of this certificate, the contractor may employ persons who do not normally reside in the labor area to fill positions covered by the certificate, notwithstanding the provisions of subparagraph (1c) above.

5. The provisions of 23 CFR 633.207(e) allow the contracting agency to provide a contractual preference for
ATTACHMENT 3 TO EXHIBIT 8

GDOT Special Provision
Modifications to FHWA Form 1273

1. Subsections IV.3(a); Delete the wording referencing “social security number” in the second sentence and substitute “and the last four digits of the social security number”.
ATTACHMENT 4 TO EXHIBIT 8

FEDERAL PREVAILING WAGE RATE

(Subject to change)

DEPARTMENT OF TRANSPORTATION STATE OF GEORGIA
U. S. Department of Labor
General Decision Number: GA180287 01/05/2018 GA287
Superseded General Decision Number: GA20170287

State: Georgia
Construction Type: Highway
County: Richmond County in Georgia.

HIGHWAY CONSTRUCTION PROJECTS

Note: Under Executive Order (EO) 13658, an hourly minimum wage of $10.35 for calendar year 2018 applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2015. If this contract is covered by the EO, the contractor must pay all workers in any classification listed on this wage determination at least $10.35 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in calendar year 2018. The EO minimum wage rate will be adjusted annually.

Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

Modification Number Publication Date
0 01/05/2018
SUGA2014-109 10/03/2016

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<th>Classification</th>
<th>Rates</th>
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<td>CARPENTER, Excludes Form Work</td>
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### OPERATIONS

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**WELDERS** - Receive rate prescribed for craft performing operation to which welding is incidental.

Note: Executive Order (EO) 13706, Establishing Paid Sick Leave for Federal Contractors applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2017. If this contract is covered by the EO, the contractor must provide employees with 1 hour of paid sick leave for every 30 hours they work, up to 56 hours of paid sick leave each year. Employees must be permitted to use paid sick leave for their own illness, injury or other health-related needs, including preventive care; to assist a family member (or person who is like family to the employee) who is ill, injured, or has other health-related needs, including preventive care; or for reasons resulting from, or to assist a family member (or person who is like family to the employee) who is a victim of, domestic violence, sexual assault, or stalking. Additional information on contractor requirements and worker protections under the EO is available at [www.dol.gov/whd/govcontracts](http://www.dol.gov/whd/govcontracts).

**Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (ii)).**
ATTACHMENT 5 TO EXHIBIT 8

STANDARD FEDERAL EQUAL EMPLOYMENT OPPORTUNITY CONSTRUCTION CONTRACT SPECIFICATIONS (EXECUTIVE ORDER 11246) (43 FR 14895)

1. As used in these specifications:
   a. “Covered area” means the geographical area described in the solicitation from which this contract resulted;
   b. “Director” means Director, Office of Federal Contract Compliance Programs, United States Department of Labor, or any person to whom the Director delegates authority;
   d. “Minority” includes:
      (i) Black (all persons having origins in any of the Black African racial groups not of Hispanic origin);
      (ii) Hispanic (all persons of Mexican, Puerto Rican, Cuban, Central or South American or other Spanish Culture or origin, regardless of race);
      (iii) Asian and Pacific Islander (all persons having origins in any of the original peoples of the Far East, Southeast Asia, the Indian Subcontinent, or the Pacific Islands); and
      (iv) American Indian or Alaskan Native (all persons having origins in any of the original peoples of North America and maintaining identifiable tribal affiliations through membership and participation or community identification).

2. Whenever the Contractor, or any Subcontractor at any tier, subcontracts a portion of the work involving any construction trade, it shall physically include in each subcontract in excess of $10,000 the provisions of these specifications and the Notice which contains the applicable goals for minority and female participation and which is set forth in the solicitations from which this contract resulted.

3. If the Contractor is participating (pursuant to 41 CFR 60–4.5) in a Hometown Plan approved by the U.S. Department of Labor in the covered area either individually or through an association, its affirmative action obligations on all work in the Plan area (including goals and timetables) shall be in accordance with that Plan for those trades which have unions participating in the Plan. Contractors must be able to demonstrate their participation in and compliance with the provisions of any such Hometown Plan. Each Contractor or Subcontractor participating in an approved Plan is individually required to comply with its obligations under the EEO clause, and to make a good faith effort to achieve each goal under the Plan in each trade in which it has employees. The overall good faith performance by other Contractors or Subcontractors toward a goal in an approved Plan does not excuse any covered Contractor’s or Subcontractor’s failure to take good faith efforts to achieve the Plan goals and timetables.

4. The Contractor shall implement the specific affirmative action standards provided in paragraphs 7a through p of these specifications. The goals set forth in the solicitation from which
this contract resulted are expressed as percentages of the total hours of employment and training of minority and female utilization the Contractor should reasonably be able to achieve in each construction trade in which it has employees in the covered area. Covered Construction contractors performing construction work in geographical areas where they do not have a Federal or federally assisted construction contract shall apply the minority and female goals established for the geographical area where the work is being performed. Goals are published periodically in the Federal Register in notice form, and such notices may be obtained from any Office of Federal Contract Compliance Programs office or from Federal procurement contracting officers. The Contractor is expected to make substantially uniform progress in meeting its goals in each craft during the period specified.

5. Neither the provisions of any collective bargaining agreement, nor the failure by a union with whom the Contractor has a collective bargaining agreement, to refer either minorities or women shall excuse the Contractor’s obligations under these specifications, Executive Order 11246, or the regulations promulgated pursuant thereto.

6. In order for the nonworking training hours of apprentices and trainees to be counted in meeting the goals, such apprentices and trainees must be employed by the Contractor during the training period, and the Contractor must have made a commitment to employ the apprentices and trainees at the completion of their training, subject to the availability of employment opportunities. Trainees must be trained pursuant to training programs approved by the U.S. Department of Labor.

7. The Contractor shall take specific affirmative actions to ensure equal employment opportunity. The evaluation of the Contractor’s compliance with these specifications shall be based upon its effort to achieve maximum results from its actions. The Contractor shall document these efforts fully, and shall implement affirmative action steps at least as extensive as the following:

   a. Ensure and maintain a working environment free of harassment, intimidation, and coercion at all sites, and in all facilities at which the Contractor’s employees are assigned to work. The Contractor, where possible, will assign two or more women to each construction project. The Contractor shall specifically ensure that all foremen, superintendents, and other on-site supervisory personnel are aware of and carry out the Contractor’s obligation to maintain such a working environment, with specific attention to minority or female individuals working at such sites or in such facilities.

   b. Establish and maintain a current list of minority and female recruitment sources, provide written notification to minorities and female recruitment sources and to community organizations when the Contractor or its unions have employment opportunities available, and maintain a record of the organizations’ responses.

   c. Maintain a current file of the names, addresses and telephone numbers of each minority and female off-the-street applicant and minority or female referral from a union, a recruitment source or community organization and of what action was taken with respect to each such individual. If such individual was sent to the union hiring hall for referral and was not referred back to the Contractor by the union or, if referred, not employed by the Contractor, this shall be documented in the file with the reason therefor, along with whatever additional actions the Contractor may have taken.

   d. Provide immediate written notification to the Director when the union or unions with which the Contractor has a collective bargaining agreement has not referred to the Contractor a
minority person or woman sent by the Contractor, or when the Contractor has other information that the union referral process has impeded the Contractor’s efforts to meet its obligations.

e. Develop on-the-job training opportunities and/or participate in training programs for the area which expressly include minority and women, including upgrading programs and apprenticeship and trainee programs relevant to the Contractor’s employment needs, especially those programs funded or approved by the Department of Labor. The Contractor shall provide notice of these programs to the sources compiled under 7b above.

f. Disseminate the Contractor’s EEO policy by providing notice of the policy to unions and training programs and requesting their cooperation in assisting the Contractor in meeting its EEO obligations; by including it in any policy manual and collective bargaining agreement; by publicizing it in the company newspaper, annual report, etc.; by specific review of the policy with all management personnel and with all minority and female employees at least once a year and by posting the company EEO policy on bulletin boards accessible to all employees at each location where construction work is performed.

g. Review, at least annually, the company’s EEO policy and affirmative action obligations under these specifications with all employees having any responsibility for hiring, assignment, layoff, termination or other employment decisions including specific review of these items with onsite supervisory personnel such as Superintendents, General Foremen, etc., prior to the initiation of construction work at any job site. A written record shall be made and maintained identifying the time and place of these meetings, persons attending, subject matter discussed, and disposition of the subject matter.

h. Disseminate the Contractor’s EEO policy externally by including it in any advertising in the news media, specifically including minority and female news media, and providing written notification to and discussing the Contractor’s EEO policy with other Contractors and Subcontractors with whom the Contractor does or anticipates doing business.

i. Direct its recruitment efforts, both oral and written, to minority, female and community organizations, to schools with minority and female students and to minority and female recruitment and training organizations serving the Contractor’s recruitment area and employment needs. Not later than one month prior to the date for the acceptance of applications for apprenticeship or other training by any recruitment source, the Contractor shall send written notification to organizations such as the above, describing the openings, screening procedures, and tests to be used in the selection process.

j. Encourage present minority and female employees to recruit other minority persons and women and, where reasonable, provide after school, summer and vacation employment to minority and female youth both on the site and in other areas of the Contractor’s work force.

k. Validate all tests and other selection requirements where there is an obligation to do so under 41 CFR Part 60-3.

l. Conduct, at least annually, an inventory and evaluation at least of all minority and female personnel for promotional opportunities and encourage these employees to seek or to prepare for, through appropriate training, etc. such opportunities.
m. Ensure that seniority practices, job classifications, work assignments and other personnel practices, do not have a discriminatory effect by continually monitoring all personnel and employment related activities to ensure that the EEO policy and the Contractor's obligations under these specifications are being carried out.

n. Ensure that all facilities and company activities are nonsegregated except that separate or single-user toilet and necessary changing facilities shall be provided to assure privacy between the sexes.

o. Document and maintain a record of all solicitations of offers for subcontracts from minority and female construction contractors and suppliers, including circulation of solicitations to minority and female contractor associations and other business associations.

p. Conduct a review, at least annually of all supervisors' adherence to and performance under the Contractor's EEO policies and affirmative action obligations.

8. Contractors are encouraged to participate in voluntary associations which assist in fulfilling one or more of their affirmative action obligations (7a through p). The efforts of a contractor association, joint contractor-union, contractor-community, or other similar group of which the contractor is a member and participant, may be asserted as fulfilling any one or more of its obligations under 7a through p of these Specifications provided that the contractor actively participates in the group, makes every effort to assure that the group has a positive impact on the employment of minorities and women in the industry, ensures that the concrete benefits of the program are reflected in the Contractor's minority and female workforce participation, makes a good faith effort to meet its individual goals and timetables, and can provide access to documentation which demonstrates the effectiveness of actions taken on behalf of the Contractor. The obligation to comply, however, is the Contractor's and failure of such a group to fulfill an obligation shall not be a defense for the Contractor's noncompliance.

9. A single goal for minorities and a separate single goal for women have been established. The Contractor, however, is required to provide equal employment opportunity and to take affirmative action for all minority groups, both male and female, and all women, both minority and non-minority. Consequently, the Contractor may be in violation of the Executive Order if a particular group is employed in a substantially disparate manner (for example, even though the Contractor has achieved its goals for women generally, the Contractor may be in violation of the Executive Order if a specific minority group of women is underutilized).

10. The Contractor shall not use the goals and timetables or affirmative action standards to discriminate against any person because of race, color, religion, sex, or national origin.

11. The Contractor shall not enter into any Contract or Subcontract with any person or firm debarred from Government contracts pursuant to Executive Order 11246.

12. The Contractor shall carry out such sanctions and penalties for violation of these specifications and of the Equal Opportunity Clause, including suspension, termination and cancellation of existing subcontracts as may be imposed or ordered pursuant to Executive Order 11246, as amended, and its implementing regulations, by the Office of Federal Contract Compliance Programs. Any Contractor who fails to carry out such sanctions and penalties shall be in violation of these specifications and Executive Order 11246, as amended.
13. The Contractor, in fulfilling its obligations under these specifications, shall implement specific affirmative action steps, at least as extensive as those standards prescribed in paragraph 7 of these specifications, so as to achieve maximum results from its efforts to ensure equal employment opportunity. If the Contractor fails to comply with the requirements of the Executive Order, the implementing regulations, or these specifications, the Director shall proceed in accordance with 41 CFR 60–4.8.

14. The Contractor shall designate a responsible official to monitor all employment related activity to ensure that the company EEO policy is being carried out, to submit reports relating to the provisions hereof as may be required by the Government and to keep records. Records shall at least include for each employee the name, address, telephone numbers, construction trade, union affiliation if any, employee identification number when assigned, social security number, race, sex, status (e.g., mechanic, apprentice trainee, helper, or laborer), dates of changes in status, hours worked per week in the indicated trade, rate of pay, and locations at which the work was performed. Records shall be maintained in an easily understandable and retrievable form; however, to the degree that existing records satisfy this requirement, contractors shall not be required to maintain separate records.

15. Nothing herein provided shall be construed as a limitation upon the application of other laws which establish different standards of compliance or upon the application of requirements for the hiring of local or other area residents (e.g., those under the Public Works Employment Act of 1977 and the Community Development Block Grant Program).
ATTACHMENT 6 TO EXHIBIT 8

DISADVANTAGED BUSINESS ENTERPRISE PROGRAM
CRITERIA FOR ACCEPTABILITY

The purpose of this special provision is to establish criteria for acceptability of DBE firms for work performed on this contract. The intent is to ensure all participation counted toward fulfillment of the DBE goals is (1) real and substantial, (2) actually performed by viable, independent DBE owned firms, and (3) in accordance with the spirit of the applicable laws and regulations.

The policy of the Georgia Department of Transportation is to ensure compliance with Title VI of the Civil Rights Act of 1964, 49 Code of Federal Register, Part 26 and related statutes and regulations in all program activities.

To this end the Georgia Department of Transportation shall not discriminate on the basis of race, color, sex or national origin in the award, administration and performance of any Georgia Department of Transportation assisted contract or in the administration of its Disadvantaged Business Enterprise Program. The Georgia Department of Transportation shall take all necessary and reasonable steps to ensure nondiscrimination.

DBE payments and commitments for Federal-aid projects shall be separate and distinct and cannot be transferred or combined in any matter.

The DBE Goal specified in the contract will be a percentage representing the DBE Race Conscious Participation. The Contractor will strive to achieve an additional percentage in his/her contracts for all projects during the course of the current State Fiscal Year, in order to meet the overall Georgia Department of Transportation DBE goal.

DBE DIRECTORY: The Department has available a directory or source list to facilitate identifying DBEs with capabilities relevant to general contracting requirements and to particular solicitations. The Department will make the directory available to bidders and proposers in their efforts to meet the DBE requirements. The directory or listing includes firms which the Department has certified to be eligible DBEs in accordance with 49 CFR Part 26.

GOAL FOR PARTICIPATION: If a percentage goal for DBE participation in this contract is set forth elsewhere in this proposal, the Contractor shall complete the DBE GOALS Form included in the proposal. The Contractor is encouraged to make every effort to achieve the goal set by the Department. However, if the Contractor cannot find sufficient DBE participants to meet the goal established by the Department, the Department will consider for award a proposal with less participation than the established goal if:

(A) The bidder can demonstrate no greater participation could be obtained. This should be well documented by demonstrating the Contractor’s actions through good faith efforts. The following is a list of types of actions which the Department will consider as part of the Contractor’s good faith efforts to obtain DBE participation. This is not intended to be a mandatory checklist nor intended to be exclusive or exhaustive. Other factors or types of efforts may be relevant in appropriate cases.

(1) Soliciting through all reasonable and available means (e.g. attendance at pre-bid meetings, advertising and/or written notices) the interest of all certified DBEs who have the
capability to perform the work of the contract. The Contractor must solicit this interest within sufficient time to allow the DBEs to respond to the solicitation. The Contractor must determine with certainty if the DBEs are interested by taking appropriate steps to follow up initial solicitations.

(2) Selecting portions of the work to be performed by DBEs in order to increase the likelihood the DBE goals will be achieved. This includes, where appropriate, breaking out contract work items into economically feasible units to facilitate DBE participation, even when the Contractor might otherwise prefer to perform these work items with its own forces.

(3) Providing interested DBEs with adequate information about the plans, specifications, and requirements of the contract in a timely manner to assist DBEs participants in responding to a solicitation.

(4) (a) Negotiating in good faith with interested DBEs. Contractor(s) are responsible to make a portion of the work available to DBE subcontractors and suppliers and to select those portions of the work or material needs consistent with the available DBE subcontractors and suppliers, so as to facilitate DBE participation. Evidence of such negotiation includes the names, addresses, and telephone numbers of DBEs that were considered; a description of the information provided regarding the plans and specifications for the work selected for subcontracting; and evidence as to why additional agreements could not be reached for DBEs to perform the work.

(b) Contractor(s) using good business judgment would consider a number of factors in negotiating with subcontractors, including DBE subcontractors, and would take a firm’s price and capabilities as well as contract goals into consideration. However, the fact there may be some additional costs involved in finding and using DBEs is not in itself sufficient reason for a bidder’s failure to meet the contract DBE goal, as long as such costs are reasonable. Also, the ability or desire of a Contractor to perform the work of a contract with its own organization does not relieve the Contractor of the responsibility to make good faith efforts. Contractors are not, however, required to accept higher quotes from DBEs if the price difference is excessive or unreasonable.

(5) Not rejecting DBEs as being unqualified without sound reasons based on a thorough investigation of their capabilities. The Contractor’s standing within its industry, membership in specific groups, organizations, or associations and political or social affiliations (for example union vs. nonunion employee status) are not legitimate causes for the rejection or non solicitation of bids in the Contractor’s efforts to meet the project goal.

(6) Making efforts to assist interested DBEs in obtaining bonding, lines of credit, or insurance as required by the contractor.

(7) Making efforts to assist interested DBEs in obtaining necessary equipment, supplies, materials, or related assistance or services.

(8) Effectively using the services of available minority/women community organizations; minority/women Contractors’ groups; local, state, and Federal minority/women business assistance offices; and other organizations as allowed on a case-by-case basis to provide assistance in the recruitment and placement of DBE’s.

(B) The participation proposed by the low bidder is not substantially less than the participation proposed by the other bidders on the same contract.
If no percentage goal is set forth in the proposal, the contractor may enter a proposed DBE participation. This voluntary DBE participation will count as race neutral DBE participation. Prime Contractor shall report race-neutral participation in accordance with the DBE Monthly Report requirements shown in this document.

To be eligible for award of this contract, All bidders will be required to submit the following information to the Department’s Procurement Officer as designated in Article 2.2.1 of the Instructions to Proposers (ITP) by the close of business on the 3rd working day following opening of the bid as a matter of bidder responsibility.

(1) The names and addresses of DBE firms committed to participate in the Contract;
(2) A description of the work each DBE will perform;
(3) The dollar amount of the participation of each DBE firm participating;
(4) Written documentation of the bidder’s commitment to use a DBE subcontractor whose participation it submits to meet a contract goal;
(5) Written confirmation from the DBE committed to participating in the contract, as provided in the prime contractor’s commitment.
(6) If the contract goal is not met, evidence of good faith efforts must be provided.

Failure by a bidder to furnish the above information may subject the bid to disqualification. Also failure by the bidder to submit satisfactory evidence of good faith efforts may subject the bid to disqualification.

Award of a contract by the Department to a Prime Contractor who has listed DBE participants with the bid may not constitute final approval by the Department of the listed DBE. The Department reserves the right to approve or disapprove a Disadvantaged firm after a review of the Disadvantaged firm’s proposal participation. Payment to the Contractor under the contract may be withheld until final approval of the listed DBEs is granted by the Department.

If the Contractor desires to substitute a DBE in lieu of those listed in the proposal, a letter of concurrence shall be required from the listed DBE prior to approval of the substitution, unless this requirement is waived by the Department.

Agreements between bidder and a DBE in which promises not to provide Subcontracting quotations to other bidders are prohibited.

**DEFINITION:** For the purposes of this provision, the following definitions will apply: Disadvantaged Business Enterprise or DBE means a for-profit small business concern –

(1) Ensuring at least 51 percent owned by one or more individuals who are both socially and economically disadvantaged or, in the case of a corporation, in which 51 percent of the stock is owned by one or more such individuals; and

(2) Whose management and daily business operations are controlled by one or more of the socially and economically disadvantaged individuals who own the business.
Good Faith Efforts means efforts to achieve a DBE goal or other requirement of this part which, by their scope, intensity, and appropriateness to the objective, can reasonably be expected to fulfill the program requirement.

Joint Venture means an association of a DBE firm and one or more other firms to carry out a single, for-profit business enterprise, for which the parties combine their property, capital, efforts, skills and knowledge, and in which the DBE is responsible for a distinct, clearly defined portion of the work of the contract and whose share in the capital contribution, control, management, risks, and profits of the joint venture are commensurate with its ownership interest.

Socially and Economically Disadvantaged Individual means any individual who is a citizen (or lawfully admitted permanent resident) of the United States and who is –

(1) Any individual who the Department finds to be a socially and economically disadvantaged individual on a case-by-case basis.

(2) Any individual in the following groups, members of which are reputably presumed to be socially and economically disadvantaged.

(i) “Black Americans,” which includes persons having origins, in any of the Black racial groups of Africa;

(ii) “Hispanic Americans,” which includes persons of Mexican, Puerto Rican, Cuban, Dominican, Central or South American, or other Spanish or Portuguese culture or origin, regardless of race;

(iii) “Native Americans,” which includes persons who are American Indians, Eskimos, Aleuts, or Native Hawaiians;

(iv) “Asian-Pacific Americans,” which includes persons whose origins are from Japan, China, Taiwan, Korea, Burma (Myanmar), Vietnam, Laos, Cambodia (Kampuchea), Thailand, Malaysia, Indonesia, the Philippines, Brunei, Samoa, Guam, the U.S. Trust Territories of the Pacific Islands (Republic of Palau), the Commonwealth of the Northern Marianas Islands, Macao, Fiji, Tonga, Kiribati, Juvalu, Nauru, Federated States of Micronesia, or Hong Kong;

(v) “Subcontinent Asian Americans,” which includes persons whose origins are from India, Pakistan, Bangladesh, Bhutan, the Maldives Islands, Nepal or Sri Lanka;

(vi) Women;

(vii) Any additional groups whose members are designated as socially and economically disadvantaged by the SBA, at such time as the SBA designation becomes effective.

(3) GDOT will presume that such persons are socially and economically disadvantaged only to the extent permitted by applicable federal law.

Race-conscious measure is one focused specifically on assisting only DBEs, including women-owned DBEs.

Race-neutral measure is one being, or can be, used to assist all small businesses. For the purposes of this part, race-neutral includes gender-neutrality.
DISCRIMINATION PROHIBITED: No person shall be excluded from participation in, denied the benefits of, or otherwise discriminated against in connection with the award and performance of this contract on the grounds of race, color, sex or national origin.

The following assurance becomes a part of this contract and must be included in and made a part of each subcontract the prime contractor enters into with their subcontractors (49 CFR 26.13):

"The contractor, and/or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The contractor shall carry out applicable requirements of 49 CFR Part 26 in the award and administration of DOT – assisted contracts. Failure by the contractor to carry out these requirements is (breach) of this contract which may result in the termination of this contract or such other remedy as the Department deems appropriate.

Failure to Achieve Requirements: Periodic reviews shall be made by the Department to determine the extent of compliance with the requirements set forth in this provision. If the Contractor is found to be in noncompliance, further payments for any work performed may be withheld until corrective action is taken. If corrective action is not taken, it may result in termination of this contract.

Participation will be counted toward fulfillment of the DBE goal as follows:

(A) When a DBE participates in a contract, the Contractor counts only the value of the work actually performed by the DBE toward DBE goals.

(1) Count the entire amount of the portion of a construction contract (or other contract not covered by paragraph (A) (2) of this section) performed by the DBE’s own forces. Include the cost of supplies and materials obtained by the DBE for the work of the contract, including supplies purchased or equipment leased by the DBE (except supplies and equipment the DBE subcontractor purchases or leases from the prime contractor or its affiliate).

(2) Count the entire amount of fees or commissions charged by a DBE firm for providing a bona fide service, such as professional, technical consultant, or managerial services, or for providing bonds or insurance specifically required for the performance of a DOT-assisted contract, toward DBE goals, provided the Department determines the fee is reasonable and not excessive as compared with fees customarily allowed for similar services.

(3) When a DBE subcontracts part of the work of its contract to another firm, the value of the subcontracted work may be counted toward DBE goals only if the DBE’s subcontractor is itself a DBE. Work that a DBE subcontracts to a non-DBE firm does not count toward DBE goals.

(B) When a DBE performs as a participant in a joint venture, count a portion of the total dollar value of the contract equal to the distinct, clearly defined portion of the work of the contract the DBE performs with own forces toward DBE goals.

(C) Count expenditures to a DBE contractor toward DBE goals only if the DBE is performing a commercially useful function on that contract.

(1) A DBE performs a commercially useful function when responsible for execution of the work of the contract and carrying out responsibilities by actually performing, managing, and supervising the work involved. To perform a commercially useful function, the DBE must also be
responsible, with respect to materials and supplies used on the contract, for negotiating price, determining quality and quantity, ordering the material, and installing (where applicable) and paying for the material itself.

(2) A DBE does not perform a commercially useful function if their role is limited to being an extra participant in a transaction, contract, or project through which funds are passed in order to obtain the appearance of DBE participation.

(3) If a DBE does not perform or exercise responsibility for at least 30 percent of the total cost of their contract with their own work force, or the DBE subcontracts a greater portion of the work of a contract than would be expected on the basis of normal industry practice for the type of work involved, the Department will presume the DBE is not performing a commercially useful function.

(4) When a DBE is presumed not to be performing a commercially useful function as provided in paragraph (C) (3) of this section, the DBE may present evidence to rebut this presumption.

(5) The Department’s decisions on commercially useful function matters are subject to review by the US DOT, but are administratively appealable to the US DOT.

(D) The following factors are to be used in determining whether a DBE trucking company is performing a commercially useful function:

(1) The DBE must be responsible for the management and supervision of the entire trucking operation for which they are responsible on a particular contract, and there cannot be a contrived arrangement for the purpose of meeting DBE goals.

(2) The DBE must itself own and operate at least one fully licensed, insured, and operational truck used on the contract.

(3) The DBE receives credit for the total value of the transportation services it provides on the contract using trucks it owns, insures, and operates using drivers it employs.

(4) The DBE may lease trucks from another DBE firm, including an owner/operator who is certified as a DBE. The DBE who leases trucks from another DBE receives credit for the total value of the transportation services the lessee DBE provided on the contract.

(5) The DBE may also lease trucks from a non-DBE and is entitled to credit only for the fee or commission it receives as a result of the lease arrangement. The DBE does not receive credit for the total value of the transportation services provided by the lessee, since these services are not provided by a DBE.

(6) For purposes of this paragraph (D), a lease must indicate the DBE has exclusive use of and control over the truck. This does not preclude the leased truck from working for others during the term of the lease with the consent of the DBE, so long as the lease gives the DBE absolute priority for use of the leased truck. Leased trucks must display the name and identification number of the DBE.

(E) Count expenditures with DBEs for materials or supplies toward DBE goals as provided in the following:
(1) (i) If the materials or supplies are obtained from a DBE manufacturer, count 100 percent of the cost of the materials or supplies toward DBE goals.

(ii) For purposes of this paragraph, a manufacturer is a firm that operates or maintains a factory or establishment that produces, on the premises, the materials, supplies, articles, or equipment required under the contract and of the general character described by the specifications.

(2) (i) If the materials or supplies are obtained from a DBE regular dealer, count 60 percent of the cost of the materials or supplies toward DBE goals.

(ii) For purposes of this section, a regular dealer is a firm owning, operating, or maintaining a store, warehouse, or other establishment in which the materials, supplies, articles or equipment of the general character described by the specifications and required under the contract are bought, kept in stock, and regularly sold or leased to the public in the usual course of business.

(A) To be a regular dealer, the firm must be an established, regular business engaging, as its principal business and under its own name, in the purchase and sale or lease of the products in question.

(B) A person may be a regular dealer in such bulk items as petroleum products, steel, cement, gravel, stone, or asphalt without owning, operating, or maintaining a place of business as provided in this paragraph (E)(2)(ii) if the person both owns and operates distribution equipment for the products. Any supplementing of regular dealers' own distribution equipment shall be by a long-term lease agreement and not on an ad hoc or contract-by-contract basis.

(C) Packagers, brokers, manufacturers' representatives, or other persons who arrange or expedite transactions are not regular dealers within the meaning of this paragraph (E)(2).

(3) With respect to materials or supplies purchased from a DBE which is neither a manufacturer nor a regular dealer, count the entire amount of fees or commissions charged for assistance in the procurement of the materials and supplies, or fees or transportation charges for the delivery of materials or supplies required on a job site, toward DBE goals, provided you determine the fees to be reasonable and not excessive as compared with fees customarily allowed for similar services. Do not count any portion of the cost of the materials and supplies themselves toward DBE goals, however.

(4) Do not count the participation of a DBE subcontractor toward the prime contractor's DBE achievements until the amount being counted toward the goal has been paid to the DBE.

(5) No participation will be counted not in compliance with Special Provision entitled "Criteria for Acceptability" which is a part of this contract or with any provisions included in 49 CFR Part 26.

(6) If the contract amount overruns, the contractor will not be required to increase the dollar amount of DBE participation. If the contract amount under runs, the contractor will not be allowed to under run the dollar amount of DBE participation except when the DBE subcontracted items themselves under run.
REPORTS

A: The contractor shall submit a “DBE Participation Report” on this contract monthly which shall include the following:

1. The name of each DBE participating in the contract.
2. A description of the work to be performed, materials, supplies, and services provided by each DBE.
3. Whether each DBE is a supplier, subcontractor, owner/operator, or other.
4. The dollar value of each DBE subcontract or supply agreement.
5. The actual payment to date of each DBE participating in the contract.
6. The report shall be updated by the Prime Contractor whenever the approved DBE has performed a portion of the work that has been designated for the contract. Copies of this report should be transmitted promptly to the Engineer. Failure to submit the report within 30 calendar days following the end of the month may cause payment to the contractor to be withheld.
7. The Prime Contractor shall notify the Project Engineer at least 24 hours prior to the time the DBE commences working on the project. The DBE must furnish supervision of the DBE portion of the work, and the person responsible for this supervision must report to the Project Engineer when they begin work on the project. They must also inform the Project Engineer when their forces will be doing work on the project.

B. In order to comply with 49 CFR 26.11, the Prime Contractor shall submit documentation regarding all payments made from the Prime to all DBE subcontractors on federal aid projects in the form of copies of cancelled checks or notarized electronic documentation which validates said payments made on the DBE Monthly Participation Reports. This information shall be required monthly and submitted with the DBE Monthly Participation Report.

C. Failure to respond within the time allowed in the request will be grounds for withholding all payments on all Contracts.

SUBSTITUTION OF DBEs: The Contractor shall make reasonable efforts to replace a DBE Subcontractor unable to perform work for any reason with another DBE. The Department shall approve all substitutions of Subcontractors in order to ensure the substitute firms are eligible DBEs.

CERTIFICATION OF DBEs: To ensure the DBE Program benefits only firms owned and controlled by Disadvantaged Individuals, the Department shall certify the eligibility of DBEs and joint ventures involving DBEs named by bidders.

Questions concerning DBE Certification/Criteria should be directed to the EEO Office at (404) 631-1972.
DEBARMENT AND SUSPENSION CERTIFICATION

1. By signing and submitting its proposal or bid, and by executing the Agreement or Contract, each prospective Design-Build Team member (at all tiers) shall be deemed to have signed and delivered the following certification:

The undersigned certifies to the best of its knowledge and belief, that it and its principals:

a. Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any federal department or agency;

b. Have not within a 3-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (federal, state or local) transaction or contract under a public transaction; violation of federal or state antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;

c. Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (federal, state or local) with commission of any of the offenses enumerated in paragraph 1b of this certification; and

d. Have not within a 3-year period preceding this application/proposal had one or more public transactions (federal, state or local) terminated for cause or default.

2. Where the prospective Design-Build Team member is unable to certify to any of the statements in this certification, such Person shall attach a certification to its proposal or bid, or shall submit it with the executed Agreement or Contract, stating that it is unable to provide the certification and explaining the reasons for such inability.
CERTIFICATION REGARDING USE OF CONTRACT FUNDS FOR LOBBYING

By signing and submitting its proposal or bid, and by executing the Agreement or any Contract, each prospective Design-Build Team and Contractor (at all tiers) shall be deemed to have signed and delivered the following:

1. The prospective Design-Build Team/Contract certifies, to the best of its knowledge and belief, that:
   
   a. No federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of ANY federal contract, the making of any federal grant, the making of any federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any federal contract, grant, loan, or cooperative agreement.
   
   b. If any funds other than federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any federal agency, a member of Congress, an officer or employee of Congress, or an employee of a member of Congress in connection with THIS Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, “Disclosure Form to Report Lobbying,” in accordance with its instructions, and shall include a copy of said form in its proposal or bid, or submit it with the executed Agreement or Contract.

2. This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by 31 U.S.C. § 1352. Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

3. Design-Build Team/Contractor shall require that the language of this certification be included in all lower tier Contracts which exceed $100,000 and that all such recipients shall certify and disclose accordingly.

4. The undersigned certifies or affirms the truthfulness and accuracy of each statement of its certification and disclosure, if any. In addition, the undersigned understands and agrees that the provisions of 31 U.S.C. §3801, et seq., apply to this certification and disclosure, if any.

[Note: Pursuant to 31 U.S.C. § 1352(c)(1)-(2)(A), any person who makes a prohibited expenditure or fails to file or amend a required certification or disclosure form shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each expenditure or failure.]

NOTE: DESIGN-BUILD TEAM AND EACH CONTRACTOR IS REQUIRED, PURSUANT TO FEDERAL LAW, TO INCLUDE THE ABOVE LANGUAGE IN CONTRACTS OVER $100,000 AND TO OBTAIN THIS LOBBYING CERTIFICATE FROM EACH CONTRACTOR BEING PAID $100,000 OR MORE.
ATTACHMENT 9 TO EXHIBIT 8

RESERVED
ATTACHMENT 10 TO EXHIBIT 8

COMPLIANCE WITH BUY AMERICA REQUIREMENTS

Design-Build Team shall comply with the Federal Highway Administration (FHWA) Buy America Requirement in 23 CFR 635.410, which permits FHWA participation in this Agreement only if domestic steel and iron will be used on the Project. To be considered domestic, all steel and iron used and all products manufactured from steel and iron must be produced in the United States and all manufacturing processes, including application of a coating, for these materials must occur in the United States. Coating includes all processes that protect or enhance the value of the material to which the coating is applied. This requirement does not preclude a minimal use of foreign steel and iron materials, provided the cost of such materials does not exceed 0.1% of the contract price under the Agreement.

Concurrently with execution of the Agreement, Design-Build Team has completed and submitted, or shall complete and submit, to GDOT a Buy America Certificate, in the format below. After submittal, Design-Build Team is bound by its original certification.

A false certification is a criminal act in violation of 18 U.S.C. § 1001. Should this Agreement be investigated, Design-Build Team has the burden of proof to establish that it is in compliance.

At Design-Build Team’s request, GDOT may, but is not obligated to, seek a waiver of Buy America requirements if grounds for the waiver exist. However, Design-Build Team certifies that it will comply with the applicable Buy America requirements if a waiver of those requirements is not available or not pursued by GDOT. A request for a waiver shall be treated as a Change Request under Article 13.2 of the Agreement.

BUY AMERICA CERTIFICATE

Form J attached
FORM J

Buy America Certification

The undersigned Proposer hereby certifies on behalf of itself and all contractors (at all tiers) the following:

a. The Proposer shall comply with the Federal Highway Administration ("FHWA") Buy America Requirements of 23 CFR 635.410, which permits FHWA participation in the DBA only if domestic steel and iron will be used on the Project. To be considered domestic, all steel and iron used and all products manufactured from steel and iron must be produced in the United States and all manufacturing processes, including application of a coating, for these materials must occur in the United States. Coating includes all processes that protect or enhance the value of the material to which the coating is applied. This requirement does not preclude a minimal use of foreign steel and iron materials, provided the cost of such materials does not exceed 0.1% of the design-build contract price.

b. A false certification is a criminal act in violation of 18 U.S.C. 1001. Should this certification be investigated, the Proposer has the burden of proof to establish that it is in compliance.

c. At the Proposer's request, GDOT may, but is not obligated to, seek a waiver of Buy America requirements from FHWA if grounds for the waiver exist. However, the Proposer certifies that it will comply with the applicable Buy America requirements if a waiver of those requirements is not available or not pursued by GDOT.

Date: 09/21/18
Signature: [Signature]
Title: President
Proposer's Name: Superior Construction Company Southeast, LLC
ATTACHMENT 11 TO EXHIBIT 8

COMPLIANCE WITH THE CARGO PREFERENCE ACT

The Cargo Preference Act (CPA) establishes certain requirements for the use of privately owned United States-flag commercial vessels in transporting equipment, materials, and commodities by ocean vessel. Contractors are required to comply with the CPA requirements and 46 CFR 381 and are required to insert the substance of these provisions into any subcontracts issued pursuant to this contract.

Cargo Preference Act Requirements

All Federal-aid projects shall comply with 46 CFR 381.7 (a)-(b) as follows:

(a) Agreement Clauses. Use of United States-flag vessels:

(1) Pursuant to Pub. L. 664 (43 U.S.C. 1241(b)) at least 50 percent of any equipment, materials or commodities procured, contracted for or otherwise obtained with funds granted, guaranteed, loaned, or advanced by the U.S. Government under this agreement, and which may be transported by ocean vessel, shall be transported on privately owned United States-flag commercial vessels, if available.

(2) Within 20 days following the date of loading for shipments originating within the United States or within 30 working days following the date of loading for shipments originating outside the United States, a legible copy of a rated, ‘on-board’ commercial ocean bill-of-lading in English for each shipment of cargo described in paragraph (a)(1) of this section shall be furnished to both the Contracting Officer (through the prime contractor in the case of subcontractor bills-of-lading) and to the Division of National Cargo, Office of Market Development, Maritime Administration, Washington, DC 20590.

(b) Contractor and Subcontractor Clauses. Use of United States-flag vessels: The contractor agrees:

(1) To utilize privately owned United States-flag commercial vessels to ship at least 50 percent of the Gross tonnage (computed separately for dry bulk carriers, dry cargo liners, and tankers) involved, whenever shipping any equipment, material, or commodities pursuant to this contract, to the extent such vessels are available at fair and reasonable rates for United States-flag commercial vessels.

(2) To furnish within 20 days following the date of loading for shipments originating within the United States or within 30 working days following the date of loading for shipments originating outside the United States, a legible copy of a rated, ‘on-board’ commercial ocean bill-of-lading in English for each shipment of cargo described in paragraph (b)(1) of this section to both the Contracting Officer (through the prime contractor in the case of subcontractor bills-of-lading) and to the Division of National Cargo, Office of Market Development, Maritime Administration, Washington, DC 20590.

(3) To insert the substance of the provisions of this clause in all subcontracts issued pursuant to this contract.
The CPA requirements would be appropriate for oceanic shipments of materials or equipment that is intended for use on a specific Federal-aid project, such as a precast concrete structural members, fabricated structural steel, tunnel boring machines, or large-capacity cranes.

The CPA requirements are not applicable for goods or materials that come into inventories independent of an FHWA funded-contract. For example, the requirements would not apply to shipments of Portland cement, asphalt cement, or aggregates, as industry suppliers and contractors use these materials to replenish existing inventories. In general, most of the materials used for highway construction originate from existing inventories and are not acquired solely for a specific Federal-aid project.

A test for whether CPA requirements apply or do not apply to shipped goods or materials would be if the goods or materials are what one would consider to be common inventory supplies for highway construction contractor, then CPA would not apply. If the materials or goods are considered to be supplies one would consider to be not common supplies of a highway construction contractor then CPA would apply.
ATTACHMENT 12 TO EXHIBIT 8

GDOT - APPENDIX A

During the performance of this Agreement, the DB Team, for itself, its assignees, and successors in interest (hereinafter referred to as the "DB Team"), agree as follows:

1. **Compliance with Regulations**
   The DB Team shall comply with the Regulations relative to nondiscrimination in federally-assisted programs of the Department of Transportation (hereinafter referred to as DOT), Title 49, Code of Federal Regulations, part 21, as they may be amended from time to time, (hereinafter referred to as the Regulations), which are herein incorporated by reference and made a part of this Agreement.

2. **Nondiscrimination**
   The DB Team, with regard to the work performed by it during the Agreement, shall not discriminate on the grounds of race, color, sex, or national origin in the selection and retention of subcontractors, including procurement of materials and leases of equipment. The DB Team shall not participate either directly or indirectly in discrimination prohibited by Section 21.5 of the Regulations, including employment practices when the Agreement covers a program set forth in Appendix B of the Regulations.

3. **Solicitations for Subcontracts, including Procurement of Materials and Equipment**
   In all solicitations either by competitive bidding or negotiations made by the DB Team for work to be performed under a subcontract, including procurement of materials or leases of equipment, each potential subcontractor or supplier shall be notified by the DB Team of the DB Team's obligations under this Agreement and the Regulations relative to nondiscrimination on the ground of race, color, sex, or national origin.

4. **Information and Reports**
   The DB Team shall provide all information and reports required by the Regulations or directives issued pursuant thereto, and shall permit access to its books, records, accounts, other sources of information and its facilities as may be determined by GDOT or the Federal Highway Administration to be pertinent to ascertain compliance with such Regulations, orders, and instructions. Where any information required of the DB Team is in the exclusive possession of another who fails or refuses to furnish this information, the DB Team shall so certify to GDOT, or the Federal Highway Administration as appropriate, and shall set forth what efforts it has made to obtain the information.

5. **Sanctions for Noncompliance**
   In the event of the DB Team's noncompliance with the nondiscrimination provisions of this Agreement, GDOT shall impose such contractual sanctions as GDOT or the Federal Highway Administration may determine to be appropriate, including, but not limited to:

   a. Withholding of payments to the DB Team under the Agreement until the DB Team complies; and/or
   b. Cancellation, termination, or suspension of the Agreement, in whole or in part.
6. **Incorporation of Provisions**

The DB Team shall include the provisions of paragraphs (1) through (6) in every subcontract, including procurement of materials and leases of equipment, unless exempt by the Regulations, or directives issued pursuant thereto.

The DB Team shall take such action with respect to any subcontractor or procurement as GDOT or the Federal Highway Administration may direct as a means of enforcing such provisions including sanctions for noncompliance: Provided, however, that in the event the DB Team becomes involved in, or is threatened with, litigation with a subcontractor or supplier as a result of such direction, the DB Team may request GDOT enter into such litigation to protect the interests of the state and, in addition, the DB Team may request the United States to enter into such litigation to protect the interests of the United States.
### Milestone Schedule

<table>
<thead>
<tr>
<th>Milestone</th>
<th>Deadline / Duration</th>
</tr>
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<tbody>
<tr>
<td>Interim Completion Deadline #1 - Open to Intersection Traffic (duration in Days from NTP 1 to Interim Completion Deadline #1)</td>
<td>660</td>
</tr>
<tr>
<td>Interim Completion Deadline #2 - Open to traffic for EB lanes (duration in Days from NTP 1 to Interim Completion Deadline #2)</td>
<td>1103</td>
</tr>
<tr>
<td>Interim Completion Deadline #3 - Open to traffic for WB lanes (duration in Days from NTP 1 to Interim Completion Deadline #3)</td>
<td>1103</td>
</tr>
<tr>
<td>Substantial Completion Deadline</td>
<td>1103</td>
</tr>
<tr>
<td>Final Acceptance Deadline (duration in Days after Substantial Completion to achievement of Final Acceptance)</td>
<td>48</td>
</tr>
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<tr>
<td>Total aggregate closure duration for EB lanes (in hours)</td>
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</tr>
<tr>
<td>Total aggregate closure duration for WB lanes (in hours)</td>
<td>423</td>
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<tr>
<td>Closure duration for the single allowed Augusta Canal closure (in Days)</td>
<td>8</td>
</tr>
<tr>
<td>Closure duration for allowed Augusta Canal towpath closure #1 (in Days)</td>
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</tr>
<tr>
<td>Closure duration for allowed Augusta Canal towpath closure #2 (in Days)</td>
<td>3</td>
</tr>
</tbody>
</table>
**FORM M**

**Closure Durations, Interim Completion, Substantial Completion, and Final Acceptance Proposal**

**Proposer Name:** Superior Construction Company Southeast, LLC

The Proposer shall complete the fields below for each portion (segment) of the Work for which the Proposer will commit to an Interim Completion Deadline.

**Required fields are identified with an asterisk (*).**

<table>
<thead>
<tr>
<th>Description</th>
<th>Duration</th>
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</thead>
<tbody>
<tr>
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</tr>
<tr>
<td>* Substantial Completion Deadline (duration in Days from NTP 1 to achievement of Substantial Completion)</td>
<td>1103</td>
</tr>
<tr>
<td>* Final Acceptance Deadline (duration in Days after Substantial Completion to achievement of Final Acceptance)</td>
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<td>3</td>
</tr>
</tbody>
</table>

**Date:** 09/21/18

**Proposer:** Superior Construction Company Southeast, LLC

**Signature:**

**Title:** President
EXHIBIT 10

RESERVED
EXHIBIT 11

HAZARDOUS MATERIALS RISK ALLOCATION TERMS

1. Design-Build Team shall be solely responsible for Hazardous Materials Management, including all required remediation and disposal of Hazardous Materials that constitute Design-Build Team Releases of Hazardous Materials or which are otherwise with respect to any Additional Properties or Project Specific Locations. Design-Build Team shall be responsible for all Hazardous Materials Management for Design-Build Team Release(s) of Hazardous Materials or with respect to Additional Properties, even if the required Hazardous Materials Management extends beyond the end of the Term or Final Acceptance of the Work.

2. Other than a Design-Build Team Releases of Hazardous Materials or with respect to any Project Specific Locations, GDOT shall, at its own expense shall manage, treat, handle, store, remediate, remove, transport (where applicable), investigate, oversee and dispose of such Hazardous Materials in accordance with applicable Law and Governmental Approvals or otherwise enter into a Supplement Agreement with the Design-Build Team, or order such Work pursuant to Directive Letter (provided that GDOT may not require any long term monitoring of Hazardous Materials under any such Directive Letter), with respect to same.

3. Notwithstanding the aforementioned or anything to the contrary in the Agreement, none of the following costs and expenses shall be chargeable to or reimbursed by GDOT:

   (a) Costs and expenses to the extent attributable to Design-Build Team Releases of Hazardous Materials;

   (b) Delay and disruption costs and expenses, except to the extent expressly set forth under the Agreement;

   (c) Costs and expenses that could be avoided by the exercise of commercially reasonable efforts to mitigate and reduce cost; and

   (d) Attorney’s fees or other expenses incurred by Design-Build Team in demonstrating or determining the proportionate responsibility between the parties as to Design-Build Team Releases of Hazardous Materials, GDOT Releases of Hazardous Materials, Pre-existing Hazardous Materials, and/or Hazardous Materials due to any third party.

4. Nothing contained herein shall be interpreted to limit Design-Build Team's obligations with respect to Articles 7.8 or 7.9 of the Agreement.
EXHIBIT 12

RESERVED
EXHIBIT 13

DISADVANTAGED BUSINESS ENTERPRISE PROGRAM CRITERIA FOR ACCEPTABILITY

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA
DISADVANTAGED BUSINESS ENTERPRISE PROGRAM

CRITERIA FOR ACCEPTABILITY

The purpose of this special provision is to establish criteria for acceptability of DBE firms for work performed on this contract. The intent is to ensure all participation counted toward fulfillment of the DBE goals is (1) real and substantial, (2) actually performed by viable, independent DBE owned firms, and (3) in accordance with the spirit of the applicable laws and regulations.

The policy of the Georgia Department of Transportation is to ensure compliance with Title VI of the Civil Rights Act of 1964, 49 Code of Federal Regulations, Part 26 and related statutes and regulations in all program activities.

To this end the Georgia Department of Transportation shall not discriminate on the basis of race, color, sex or national origin in the award, administration and performance of any Georgia Department of Transportation assisted contract or in the administration of its Disadvantaged Business Enterprise Program. The Georgia Department of Transportation shall take all necessary and reasonable steps to ensure nondiscrimination.

The DBE Goal specified in the contract will be a percentage representing the DBE Race Conscious Participation. The DB Team will strive to achieve an additional percentage in his/her contracts for all projects during the course of the current State Fiscal Year, in order to meet the overall Georgia Department of Transportation DBE goal.

The DBE program applies to all Federal Aid projects regardless if a DBE Goal is established in the Contract or not. If no percentage goal is set forth in the proposal, the DB Team may enter a proposed DBE participation. This voluntary DBE participation will count as race neutral DBE participation. The DB Team shall report race-neutral participation in accordance with the DBE Monthly Report requirements shown in this document.
Project DBE payments and commitments may not be transferred to or combined with another contract.

**DEFINITIONS:** For the purposes of this provision, the following definitions will apply:

Disadvantaged Business Enterprises (DBE) are firms Certified by the Georgia Unified Certification program that are for-profit small business concerns:

1) Which is at least 51 percent owned by one or more individuals who are both socially and economically disadvantaged or, in the case of a corporation, in which 51 percent of the stock is owned by one or more such individuals; and

2) Whose management and daily business operations are controlled by one or more of the socially and economically disadvantaged individuals who own the business.

Good Faith Efforts means efforts to achieve a DBE goal or other requirement of this part which, by their scope, intensity, and appropriateness to the objective, can reasonably be expected to fulfill the program requirement.

Joint Venture means an association of a DBE firm and one or more other firms to carry out a single, for-profit business enterprise, for which the parties combine their property, capital, efforts, skills and knowledge, and in which the DBE is responsible for a distinct, clearly defined portion of the work of the contract and whose share in the capital contribution, control, management, risks, and profits of the joint venture are commensurate with its ownership interest.

Socially and Economically Disadvantaged Individual means any individual who is a citizen (or lawfully admitted permanent resident) of the United States and who is –

1) Any individual who the Department finds to be a socially and economically disadvantaged individual on a case-by-case basis.

2) Any individual in the following groups, members of which are reputedly presumed to be socially and economically disadvantaged.
(i) “Black Americans,” which includes persons having origins, in any of the Black racial groups of Africa;

(ii) “Hispanic Americans,” which includes persons of Mexican, Puerto Rican, Cuban, Dominican, Central or South American, or other Spanish or Portuguese culture or origin, regardless of race;

(iii) “Native Americans,” which includes persons who are American Indians, Eskimos, Aleuts, or Native Hawaiians;

(iv) “Asian-Pacific Americans,” which includes persons whose origins are from Japan, China, Taiwan, Korea, Burma (Myanmar), Vietnam, Laos, Cambodia (Kampuchea), Thailand, Malaysia, Indonesia, the Philippines, Brunei, Samoa, Guam, the U.S. Trust Territories of the Pacific Islands (Republic of Palau), the Commonwealth of the Northern Marianas Islands, Macao, Fiji, Tonga, Kiribati, Tuvalu, Nauru, Federated States of Micronesia, or Hong Kong;

(v) “Subcontinent Asian Americans,” which includes persons whose origins are from India, Pakistan, Bangladesh, Bhutan, the Maldives Islands, Nepal or Sri Lanka;

(vi) Women;

(vii) Any additional groups whose members are designated as socially and economically disadvantaged by the SBA, at such time as the SBA designation becomes effective.

(3) GDOT will presume that such persons are socially and economically disadvantaged only to the extent permitted by applicable federal law.

Race-conscious measure is one focused specifically on assisting only DBEs, including women-owned DBEs.

Race-neutral measure is one being, or can be, used to assist all small businesses. For the purposes of this part, race-neutral includes gender-neutrality.

Joint Check is a two-party check written by a prime contractor, to a DBE firm and a regular dealer of material/supplies or another third party for items or services incorporated into a project. The prime contractor issues the check as payer to the DBE and the supplier jointly (to guarantee payment to the supplier) in payment for the material/supplies used by the DBE.

**DBE DIRECTORY:** A DBE directory or source list is available to facilitate identifying DBEs with capabilities relevant to general contracting requirements and to particular solicitations.
The Department has made the directory electronically available to all bidders and proposers in their efforts to meet the DBE requirements. The directory or listing includes firms which the Department has certified to be eligible DBEs in accordance with 49 CFR Part 26.

**GOAL FOR PARTICIPATION:** If a percentage goal for DBE participation in this contract is set forth elsewhere in this proposal, the DB Team shall complete the DBE GOALS – Commitment List form included in the proposal.

The DB Team is encouraged to make every effort to achieve the goal set by the Department. However, if the DB Team cannot find sufficient DBE participants to meet the goal established by the Department, the Department may consider for award a proposal with less participation than the established goal in accordance with GDOT Standard Specification 102.07.H Failure to List Disadvantaged Business Enterprise (DBE) Participants, 49 Code of Federal Regulations 26.53 Good Faith Effort Procedures, and 49 CFR Appendix A to Part 26—Guidance Concerning Good Faith Efforts.

To be eligible for award of this contract, all bidders are required to submit the following information, as well as Good Faith Effort supporting documentation when applicable, to the Department by the close of business on the 3rd working day following opening of the bid as a matter of bidder responsibility

i. The names and addresses of DBE firms committed to participate in the Contract;

ii. A description of the work each DBE will perform; The DB Team shall provide information with their bid showing that each DBE listed by the DB Team is certified in the NAICS code(s) for the kind of work the DBE will be performing.

iii. The dollar amount of participation for each DBE firm participating; Written documentation of the bidder’s commitment to use a DBE subcontractor whose participation it submits to meet a contract goal;

iv. Written confirmation from the DBE committed to participating in the contract, as provided in the prime contractor’s commitment.

v. If the contract goal is not met, evidence of good faith efforts must be provided.
Failure by a bidder to furnish the above information may subject the bid to disqualification. Also failure by the bidder to submit satisfactory evidence of good faith efforts may subject the bid to disqualification.

Award of a contract by the Department to a DB Team who has listed DBE participants with the bid does not constitute final approval by the Department of the listed DBE. The Department reserves the right to approve or disapprove a Disadvantaged firm after a review of the Disadvantaged firm’s proposal participation. Payment to the DB Team under the contract may be withheld until final approval of the listed DBEs is granted by the Department.

If the DB Team desires to substitute a DBE in lieu of those listed in the proposal, a letter of concurrence shall be required from the listed DBE prior to approval of the substitution, unless this requirement is waived by the Department.

Agreements between bidder and a DBE promising not to provide Subcontracting quotations to other bidders are prohibited.

SUBLETTING DISCRIMINATION PROHIBITED: No person shall be excluded from participation in, denied the benefits of, or otherwise discriminated against in connection with the award and performance of this contract on the grounds of race, color, sex or national origin.

The following assurance becomes a part of this contract and must be included in and made a part of each subcontract the DB Team enters into with their subcontractors (49 CFR 26.13):

“The contractor, and/or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The contractor shall carry out applicable requirements of 49 CFR Part 26 in the award and administration of DOT – assisted contracts. Failure by the contractor to carry out these requirements is (breach) of this contract which may result in the termination of this contract or such other remedy as the Department deems appropriate”.

FAILURE TO ACHIEVE REQUIREMENTS: Periodic reviews shall be made by the Department to determine the extent of compliance with the requirements set forth in this provision. If the DB Team is found to be in noncompliance, further payments for any work
performed may be withheld until corrective action is taken. If corrective action is not taken, it may result in termination of this contract. During the life of the contract, the DB Team will be expected to demonstrate good faith efforts at goal attainment as provided by 49 CFR 26.

The DB Team shall utilize the specific DBEs listed to perform the work and supply the materials for which each is listed unless the DB Team obtains the Department’s written consent to substitute and, unless the Department’s consent is provided the DB Team shall not be entitled to any payment for work or material unless it is performed or supplied by the listed DBE, in accordance with 49 CFR 26.53.

Participation will be counted toward fulfillment of the DBE goal as follows:

(A) When a DBE participates in a contract, the DB Team counts only the value of the work actually performed by the DBE toward DBE goals.

(1) Count the entire amount of the portion of a construction contract (or other contract not covered by paragraph (A) (2) of this section) performed by the DBE’s own forces. Include the cost of supplies and materials obtained by the DBE for the work of the contract, including supplies purchased or equipment leased by the DBE (except supplies and equipment the DBE subcontractor purchases or leases from the DB Team or its affiliate).

(2) Count the entire amount of fees or commissions charged by a DBE firm for providing a bona fide service, such as professional, technical consultant, or managerial services, or for providing bonds or insurance specifically required for the performance of a DOT-assisted contract, toward DBE goals, provided the Department determines the fee is reasonable and not excessive as compared with fees customarily allowed for similar services.

(3) When a DBE subcontracts part of the work of its contract to another firm, the value of the subcontracted work may be counted toward DBE goals only if the DBE’s subcontractor is itself a DBE. Work that a DBE subcontracts to a non-DBE firm does not count toward DBE goals.
(B) **Joint Venture:** When a DBE performs as a participant in a joint venture, count a portion of the total dollar value of the contract equal to the distinct, clearly defined portion of the work of the contract the DBE performs with own forces toward DBE goals.

(C) **Commercially Useful Function:** Count expenditures to a DBE contractor toward DBE goals only if the DBE is performing a commercially useful function (CUF) on that contract.

1. A DBE performs a commercially useful function when responsible for execution of the work of the contract and carrying out responsibilities by actually performing, managing, and supervising the work involved. To perform a commercially useful function, the DBE must also be responsible, with respect to materials and supplies used on the contract, for negotiating price, determining quality and quantity, ordering the material, and installing (where applicable) and paying for the material itself.

   a. **Joint Check Agreement:** All two-party checks written by the DB Team to a DBE firm and a third party must be approved by the Department prior to claiming DBE credit. After-the-fact requests may not be permitted toward the Goal.

2. A DBE does not perform a commercially useful function if their role is limited to being an extra participant in a transaction, contract, or project through which funds are passed in order to obtain the appearance of DBE participation.

3. If a DBE does not perform or exercise responsibility for at least 30 percent of the total cost of their contract with their own work force, or the DBE subcontracts a greater portion of the work of a contract than would be expected on the basis of normal industry practice for the type of work involved, the Department will presume the DBE is not performing a commercially useful function.

4. When a DBE is presumed not to be performing a commercially useful function as provided in paragraph (C) (3) of this section, the DBE may present evidence to rebut this presumption.
(5) The Department’s decisions on commercially useful function matters are subject to review by the US DOT, but are not administratively appealable to the US DOT.

(D) **Trucking:** The following factors are to be used in determining whether a DBE trucking company is performing a commercially useful function:

1. The DBE must be responsible for the management and supervision of the entire trucking operation for which they are responsible on a particular contract, and there cannot be a contrived arrangement for the purpose of meeting DBE goals.
2. The DBE must itself own and operate at least one fully licensed, insured, and operational truck used on the contract.
3. The DBE receives credit for the total value of the transportation services it provides on the contract using trucks it owns, insures, and operates using drivers it employs.
4. The DBE may lease trucks from another DBE firm, including an owner/operator who are certified as a DBE. The DBE who leases trucks from another DBE receives credit for the total value of the transportation services the lessee DBE provided on the contract.
5. The DBE may also lease trucks from a non-DBE and is entitled to credit only for the fee or commission it receives as a result of the lease arrangement. The DBE does not receive credit for the total value of the transportation services provided by the lessee, since these services are not provided by a DBE.
6. The DBE may lease trucks without drivers from a non-DBE bona-fide truck leasing agency. If the DBE leases trucks from a non-DBE truck leasing agency and uses its own employees as drivers, it is entitled to credit for the total value of these hauling services.
7. For purposes of this paragraph (D), a lease must indicate the DBE has exclusive use of and control over the truck. This does not preclude the leased truck from working for others during the term of the lease with the consent of the DBE, so long as the lease gives the DBE absolute priority for use of the leased truck. Leased trucks must display a “leased to” sign with the name and identification number of the DBE.
(E) Count expenditures with DBEs for materials or supplies toward DBE goals as provided in the following:

(1) (i) If the materials or supplies are obtained from a DBE manufacturer, count 100 percent of the cost of the materials or supplies toward DBE goals.

(ii) For purposes of this paragraph, a manufacturer is a firm that operates or maintains a factory or establishment that produces, on the premises, the materials, supplies, articles, or equipment required under the contract and of the general character described by the specifications.

(2) (i) If the materials or supplies are obtained from a DBE regular dealer, count 60 percent of the cost of the materials or supplies toward DBE goals. (ii) For purposes of this section, a regular dealer is a firm owning, operating, or maintaining a store, warehouse, or other establishment in which the materials, supplies, articles or equipment of the general character described by the specifications and required under the contract are bought, kept in stock, and regularly sold or leased to the public in the usual course of business.

(A) To be a regular dealer, the firm must be an established, regular business engaging, as its principal business and under its own name, in the purchase and sale or lease of the products in question.

(B) A person may be a regular dealer in such bulk items as petroleum products, steel, cement, gravel, stone, or asphalt without owning, operating, or maintaining a place of business as provided in this paragraph (E)(2)(ii) if the person both owns and operates distribution equipment for the products. Any supplementing of regular dealers' own distribution equipment shall be by a long-term lease agreement and not on an ad hoc or contract-by-contract basis.

(C) Packagers, brokers, manufacturers' representatives, or other persons who arrange or expedite transactions are not regular dealers within the meaning of this paragraph (E)(2).
(3) With respect to materials or supplies purchased from a DBE which is neither a manufacturer nor a regular dealer, count the entire amount of fees or commissions charged for assistance in the procurement of the materials and supplies, or fees or transportation charges for the delivery of materials or supplies required on a job site, toward DBE goals, provided you determine the fees to be reasonable and not excessive as compared with fees customarily allowed for similar services. Do not count any portion of the cost of the materials and supplies themselves toward DBE goals, however.

(4) You must determine the amount of credit awarded to a firm for the provision of materials and supplies (e.g., whether a firm is acting as a regular dealer or a transaction expediter) on a contract-by-contract basis. Do not count the participation of a DBE subcontractor toward the DB Team’s DBE achievements until the amount being counted toward the goal has been paid to the DBE.

(5) No participation will be counted not in compliance with Special Provision entitled “Criteria for Acceptability” which is a part of this contract or with any provisions included in 49 CFR Part 26.

(6) If the contract amount overruns, the DB Team will not be required to increase the dollar amount of DBE participation. Likewise, if the contract amount under runs, the DB Team will not be allowed to under run the dollar amount of DBE participation except when the DBE subcontracted items themselves under run. The DB Team must demonstrate Good Faith Effort in meeting the goal during commission of the contract.

REPORTS

A. The DB Team shall submit a “DBE Participation Report” on this contract monthly which shall include the following:

1. The name of each DBE participating in the contract.
2. A description of the work to be performed, materials, supplies, and services provided by each DBE.

3. Whether each DBE is a supplier, subcontractor, owner/operator, or other.

4. The dollar value of each DBE subcontract or supply agreement.

5. The previous, current, and total-to-date payments to each DBE participating in the contract, minus any credits not allowed.

6. Must include DB Team’s signature with the following statement: “HEREBY CERTIFY THAT THE ABOVE STATEMENT IS TRUE AND CORRECT. SUPPORTING DOCUMENTATION IS ON FILE AND IS AVAILABLE FOR INSPECTION BY DEPARTMENT PERSONNEL AT ANY TIME. ALL PARTICIPATION COUNTED TOWARD FULFILLMENT OF THE DBE GOAL IS (1) REAL AND SUBSTANTIAL; (2) ACTUALLY PERFORMED BY Viable, INDEPENDENT DBE OWNED FIRMS; AND (3) IN ACCORDANCE WITH THE SPIRIT OF APPLICABLE LAWS AND REGULATIONS”.

7. The report shall be updated by the DB Team whenever the approved DBE has performed a portion of the work that has been designated for the contract. Copies of this report should be transmitted promptly to the Engineer. Failure to submit the report within 30 calendar days following the end of the month may cause payment to the DB Team to be withheld.

8. The DB Team shall notify the Project Engineer at least 24 hours prior to the time the DBE commences working on the project. The DBE must furnish supervision of the DBE portion of the work, and the person responsible for this supervision must report to the Project Engineer when they begin work on the project. They must also inform the Project Engineer when their forces will be doing work on the project.

B. In order to comply with 49 CFR 26.11, the DB Team shall submit documentation regarding all payments made from the DB Team to all DBE subcontractors on federal aid projects in the form of copies of cancelled checks or bank electronic fund transfer (EFT) receipts which validate said payments made on the DBE Monthly Participation Reports. This information shall be required monthly and submitted with the DBE Monthly Participation Report.
C. Failure to respond within the time allowed in the request will be grounds for withholding all payments on all Contracts.

**SUBSTITUTION OF DBEs:** The DB Team shall make reasonable efforts to replace a DBE Subcontractor unable to perform work for any reason with another DBE. The Department shall approve all substitutions of Subcontractors in order to ensure the substitute firms are eligible DBEs.

When a DBE subcontractor is terminated, or fails to complete its work on the contract for any reason, the DB Team must make good faith efforts to find another DBE subcontractor to substitute for the original DBE. These good faith efforts shall be directed at finding another DBE to perform at least the same amount of work under the contract as the DBE that was terminated, to the extent needed to meet the contract goal. The good faith efforts shall be documented by the DB Team. If the recipient requests documentation under this provision, the contractor shall submit the documentation within 7 days, which may be extended for an additional 7 days if necessary at the request of the DB Team, and the recipient shall provide a written determination to the DB Team stating whether or not good faith efforts have been demonstrated.

**CERTIFICATION OF DBEs:** To ensure the DBE Program benefits only firms owned and controlled by Disadvantaged Individuals, the Department shall certify the eligibility of DBEs and joint ventures involving DBEs named by bidders.

Questions concerning DBE Certification/Criteria should be directed to the EEO Office at (404) 631-1972.
EXHIBIT 14

DESIGN-BUILD TEAM'S DBE COMMITMENTS LIST
FORM E
STATE OF GEORGIA DEPARTMENT OF TRANSPORTATION
CONSTRUCTION CONTRACTORS
BID OPPORTUNITY LIST

This information shall be submitted in accordance with ITP Section 1.8

Prime Contractor/Consultant: Superior Construction Company Southeast, LLC
Address/Telephone Number: 7072 Business Park Boulevard North, Jacksonville, Florida 32256
Bid/Proposal Number: P/I No. 210327/RFP 484-03302018DB
Quote Submitted MM/YY: September 2018

49 CFR Part 26.11 requires the Georgia Department of Transportation to develop and maintain a "bid opportunity list". The list is intended to be a listing of all firms participating or attempting to participate, on DOT-assisted contracts. The list must include all firms that bid on prime contracts, or bid or quote subcontracts and materials supplies on DOT-assisted projects, including both DBEs and non-DBEs. For consulting companies, this list must include all subconsultants contacting you and expressing an interest in teaming with you on a specific DOT-assisted project. Prime contractors and consultants must provide information for Nos. 1, 2, 3, and 4 and must provide information they have available on Numbers 5, 5A, 6, 7, 8, and 9 for themselves, and their subcontractors and subconsultants.

1. Federal Tax ID Number: 11-1531569
   Firm Name: WSP USA Inc.
   Phone: 404-237-2115
   Address: Tower Place, 3340 Peachtree Road, NE Suite 2400
            Atlanta, Georgia 30326

   6. DBE
   7. Subcontractor
   8. Subconsultant
   9. Supplier

5. Contact: John Poulson, PE
5A. Company E mail address: john.poulson@wsp.com

1. Federal Tax ID Number: 13-1986759
   Firm Name: STV Incorporated
   Phone: 770.452.0797
   Address: 3700 Crestwood Parkway, NW
            Duluth, Georgia 30096

   6. DBE
   7. Subcontractor
   8. Subconsultant
   9. Supplier

5. Contact: E. Richard Capps Jr., PE
5A. Company E mail address: richard.capps@stvinc.com

1. Federal Tax ID Number: 58-2477048
   Firm Name: CCR Environmental, Inc.
   Phone: 770.358.7943
   Address: 3372 Pleasantdale Road, Suite 150 NE
            Atlanta, Georgia 30339

   6. DBE
   7. Subcontractor
   8. Subconsultant
   9. Supplier

5. Contact: Christian Crow
5A. Company E mail address: ccr@environmental.com
FORM E
STATE OF GEORGIA DEPARTMENT OF TRANSPORTATION
CONSTRUCTION CONTRACTORS
BID OPPORTUNITY LIST

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1. Federal Tax ID Number: 20-0594157
2. Firm Name: Long Engineering, Inc.
3. Phone: 770-951-2495
4. Address: 2550 Heritage Court SE, Suite 250
   Atlanta, Georgia 30339
5. Contact J. Ellen Long, PE, LEED AP
6. DBE
7. Non-DBE
8. Subcontractor
9. Subconsultant
10. Supplier

1. Federal Tax ID Number: 20-0594157
2. Firm Name: McNary Bergeron and Associates
3. Phone: 860-388-2267
4. Address: 44 Pond Road Old Saybrook, Connecticut 06475
5. Contact Jim Bergeron
6. DBE
7. Non-DBE
8. Subcontractor
9. Subconsultant
10. Supplier

1. Federal Tax ID Number: 58-1810664
3. Phone: 770-399-4155
4. Address: 3150 East Ponce de Leon Avenue
   Stone Mountain, Georgia 30339
5. Contact Theresa Hamby
6. DBE
7. Non-DBE
8. Subcontractor
9. Subconsultant
10. Supplier

Georgia Department of Transportation
This information shall be submitted in accordance with ITP Section 1.8.

1. Federal Tax ID Number: 65-0271367
2. Firm Name: Wantman Group, Inc.
3. Phone: 904-470-4504
4. Address: 4571 US Highway 17 S, Suite 203
   Fleming Island, Florida 32030
   (to Wilmer Engineering, Inc.)

5. Contact Eliza Partington
5A. Company E mail address: eliza.partington@wginc.com

1. Federal Tax ID Number: 58-1493606
2. Firm Name: Wilmer Engineering, Inc.
3. Phone: 770-939-0089
4. Address: 3772 Pleasantdale Road, Suite 165
   Atlanta, Georgia 30340
   (to Wilmer Engineering, Inc.)

5. Contact Jim Wilmer
5A. Company E mail address: jwilmer@willmerengineering.com

1. Federal Tax ID Number: 80-0134379
2. Firm Name: CTCs, Inc.
3. Phone: 404-343-0180
4. Address: 1435 Funston Street, SE
   Atlanta, GA 30315
   (to Wilmer Engineering, Inc.)

5. Contact Clayton Cox
5A. Company E mail address: clayton@ctcsinc.com
This information shall be submitted in accordance with ITP Section 1.8

Prime Contractor/Consultant: Superior Construction Company Southeast, LLC
Address/Telephone Number: 7072 Business Park Blvd, Jacksonville, Fl. 32256 (904) 292-4240
Bid/Proposal Number: P.I. No. 210327
Quote Submitted MM/YY: September 2018

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<tr>
<th>Prime Contractor/Consultant</th>
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<th>Bid/Proposal Number</th>
<th>Quote Submitted MM/YY</th>
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<tr>
<td>Superior Construction Company Southeast, LLC</td>
<td>7072 Business Park Blvd, Jacksonville, Fl. 32256 (904) 292-4240</td>
<td>P.I. No. 210327</td>
<td>September 2018</td>
</tr>
</tbody>
</table>

1. Federal Tax ID Number: 26-3976898
2. Firm Name: Amroad LLC
3. Phone: 954.962.7600
4. Address: 3975 Pembroke Rd.
5. Contact: Laureano Martinez-Aunon
6. DBE
7. Subcontractor
8. Subconsultant
9. Supplier

Hollywood, Fl. 33021

5.A. Company Email address: launon@amroadfl.com

1. Federal Tax ID Number: 59-2427024
2. Firm Name: David Taylor Construction
3. Phone: 229.891.4519
4. Address: PCB 1764
5. Contact: David Taylor
6. DBE
7. Subcontractor
8. Subconsultant
9. Supplier

Moultrie, GA 31776

5.A. Company Email address: dtaylor@gmail.com

1. Federal Tax ID Number: 37-0962090
2. Firm Name: Professional Service Industries
3. Phone: 407.304.5660
4. Address: 1748 33rd St.
5. Contact: Robert Bryant
6. DBE
7. Subcontractor
8. Subconsultant
9. Supplier

Orlando, FL 32839

5.A. Company Email address: robert.bryant@psilusa.com
FORM E
STATE OF GEORGIA DEPARTMENT OF TRANSPORTATION
CONSTRUCTION CONTRACTORS
BID OPPORTUNITY LIST

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1. Federal Tax ID Number: 58-1022493
2. Firm Name: Blount Sanford Construction Co
3. Phone: 770.638.2959
4. Address: 5275 Webb Pkwy

   Lilburn, GA 30047

5. Contact: Jimmy Greason
5A. Company Email address: jgreason@blountsandford.com

1. Federal Tax ID Number: 39-0616874
2. Firm Name: Leon's Fence & Guardrail
3. Phone: 943.646.9486
4. Address: POB 716

   Lobo, SC 29931

5. Contact: Leon Chaplin
5A. Company Email address: lfg@leonsfenceandguardrail.com

1. Federal Tax ID Number: 33-1135657
2. Firm Name: ION Electric
3. Phone: 954.434.7432
4. Address: 2001 N Andrews Ave

   Pompano Beach, FL 33069

5. Contact: Daniel Dejeu
5A. Company Email address: ddejeu@ionelectricllc.com
This information shall be submitted in accordance with ITP Section 1.8

| Prime Contractor/Consultant: Superior Construction Company Southeast, LLC |
| Address/Telephone Number: 7072 Business Park Blvd, Jacksonville, FL 32256 (904) 292-4240 |
| Bid/Proposal Number: P. I. No. 210327 |
| Quote Submitted MM/YY: September 2018 |

49 CFR Part 26.11 requires the Georgia Department of Transportation to develop and maintain a "bid opportunity list". The list is intended to be a listing of all firms participating or attempting to participate, on DOT assisted contracts. The list must include all firms that bid on prime contracts, or bid or quote subcontract and materials supplies on DOT-assisted projects, including both DBEs and non-DBEs. For consulting companies, this list must include all subconsultants contacting you and expressing an interest in teaming with you on a specific DOT-assisted project. Prime contractors and consultants must provide information for Nos. 1, 2, 3, and 4 and must provide information they have available on Numbers 5, 5A, 6, 7, 8, and 9 for themselves, and their subcontractors and subconsultants.

| 1. Federal Tax ID Number: 58-2262702 |
| 2. Firm Name: Standard Concrete Products |
| 3. Phone: 912.233.8263 |
| 4. Address: 6 Hatch Cover Rd |
| 5. Contact: Joe Shepherd |
| 6. DBE |
| 7. Subcontractor |
| 8. Subconsultant |
| 9. Supplier |

| 1. Federal Tax ID Number: 57-0762671 |
| 2. Firm Name: Tindall Corp. |
| 3. Phone: 404.366.6270 |
| 4. Address: 3391 Grant Rd |
| 5. Contact: Travis Parton |
| 6. DBE |
| 7. Subcontractor |
| 8. Subconsultant |
| 9. Supplier |

| 1. Federal Tax ID Number: 52-2067962 |
| 2. Firm Name: Case Atlantis Co. |
| 3. Phone: 727.772.7740 |
| 4. Address: 4585 140th Ave N |
| 5. Contact: Lois Peck |
| 6. DBE |
| 7. Subcontractor |
| 8. Subconsultant |
| 9. Supplier |
This information shall be submitted in accordance with ITP Section 1.8

<table>
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<tr>
<th>Prime Contractor/Consultant:</th>
<th>Superior Construction Company Southeast, LLC</th>
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<tbody>
<tr>
<td>Address/Telephone Number:</td>
<td>7072 Business Park Blvd, Jacksonville, Fl 32256 (904) 202-4240</td>
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<td>P.I. No. 210327</td>
</tr>
<tr>
<td>Quote Submitted MM/YY:</td>
<td>September 2018</td>
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49 CFR Part 28.11 requires the Georgia Department of Transportation to develop and maintain a "bid opportunity list." The list is intended to be a listing of all firms participating or attempting to participate, on DOT-assisted contracts. The list must include all firms that bid on prime contracts, or bid or quote subcontractors and materials suppliers on DOT-assisted projects, including both DBEs and non-DBEs. For consulting companies, this list must include all subcontractors contacting you and expressing an interest in teaming with you on a specific DOT-assisted project. Prime contractors and consultants must provide information for Nos. 1, 2, 3, and 4 and must provide information that they have available on Numbers 5, 5A., 6, 7, 8, and 9 for themselves, and their subcontractors and subconsultants.

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<thead>
<tr>
<th>1. Federal Tax ID Number:</th>
<th>58-0641369</th>
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<tbody>
<tr>
<td>2. Firm Name:</td>
<td>Reeves Construction Co.</td>
</tr>
<tr>
<td>3. Phone:</td>
<td>478.476.0388</td>
</tr>
<tr>
<td>4. Address:</td>
<td>4931 Riverside Dr</td>
</tr>
<tr>
<td>5. Contact:</td>
<td>Andrew Ray</td>
</tr>
<tr>
<td>5A. Company Email address:</td>
<td><a href="mailto:aray@reevescc.com">aray@reevescc.com</a></td>
</tr>
</tbody>
</table>

| 6. DBE DBE |
| 7. Subcontractor |
| 8. Subconsultant |
| 9. Supplier |

<table>
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<th>1. Federal Tax ID Number:</th>
<th>63-0575531</th>
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</thead>
<tbody>
<tr>
<td>2. Firm Name:</td>
<td>Russo Corp</td>
</tr>
<tr>
<td>3. Phone:</td>
<td>205.314.1560</td>
</tr>
<tr>
<td>4. Address:</td>
<td>1421 Mims Ave SW</td>
</tr>
<tr>
<td>5. Contact:</td>
<td>Clark Gary</td>
</tr>
<tr>
<td>5A. Company Email address:</td>
<td><a href="mailto:cgary@ruscocorp.com">cgary@ruscocorp.com</a></td>
</tr>
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| 6. DBE Non-DBE |
| 7. Subcontractor |
| 8. Subconsultant |
| 9. Supplier |

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<tr>
<th>1. Federal Tax ID Number:</th>
<th>45-3889782</th>
</tr>
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<tbody>
<tr>
<td>2. Firm Name:</td>
<td>Southern States Pavement Markings</td>
</tr>
<tr>
<td>3. Phone:</td>
<td>904.814.6410</td>
</tr>
<tr>
<td>4. Address:</td>
<td>1745 Lakeside Ave</td>
</tr>
<tr>
<td>5. Contact:</td>
<td>Melvin Carter</td>
</tr>
<tr>
<td>5A. Company Email address:</td>
<td><a href="mailto:mncartera@aol.com">mncartera@aol.com</a></td>
</tr>
</tbody>
</table>

| 6. DBE Non-DBE |
| 7. Subcontractor |
| 8. Subconsultant |
| 9. Supplier |
FORM E
STATE OF GEORGIA DEPARTMENT OF TRANSPORTATION
CONSTRUCTION CONTRACTORS
BID OPPORTUNITY LIST

This information shall be submitted in accordance with ITP Section 1.8

Prime Contractor/Consultant: Superior Construction Company Southeast, LLC
Address/Telephone Number: 7072 Business Park Blvd., Jacksonville, FL 32256 (904) 292-4240
Bid/Proposal Number: P.I. No. 210327
Quote Submitted MM/YY: September 2018

49 CFR Part 26.11 requires the Georgia Department of Transportation to develop and maintain a "bid opportunity list". The list is intended to be a listing of all firms participating or attempting to participate, on DOT assisted contracts. The list must include all firms that bid on prime contracts, or bid or quote subcontracts and materials on DOT-assisted projects, including both DBEs and non-DBEs. For consulting companies, this list must include all subconsultants contacting you and expressing an interest in teaming with you on a specific DOT assisted project. Prime contractors and consultants must provide information for Nos. 1, 2, 3, and 4 and must provide information they have available on Numbers 5, 5A., 6, 7, 8 and 9 for themselves, and their subcontractors and subconsultants.

1. Federal Tax ID Number: 52-2333771
2. Firm Name: Associated Cost Engineers
3. Phone: 407.704.7803
4. Address: 801 N Pine Hills Rd.
Orlando, FL 32808

5. Contact: Jala Wade
5A. Company Email address: jwade@aceconstructionmanagement.com

1. Federal Tax ID Number: 38-1383205
2. Firm Name: Ajax Paving Industries
3. Phone: 904.303.9408
Troy, MI 48007

5. Contact: Sam Joiner
5A. Company Email address: sjoiner@ajaxpaving.com

1. Federal Tax ID Number: 59-2554036
2. Firm Name: American Lighting & Signalization
3. Phone: 229.868.8684
4. Address: 3601 Hwy 441
McRae, GA 31055

5. Contact: Larry Walker
5A. Company Email address: lwalker7@asplundh.com
This information shall be submitted in accordance with ITP Section 1.8

| Prime Contractor/Consultant: Superior Construction Company Southeast, LLC |
| Address/Telephone Number: 7072 Business Park Blvd., Jacksonville, FL, 32256 (904) 262-4249 |
| Bid/Proposal Number: P.L. No. 210327 |
| Quote Submitted MM/YY: September 2018 |

49 CRF Part 26.11 requires the Georgia Department of Transportation to develop and maintain a “bid opportunity list”. The list is intended to be a listing of all firms participating or attempting to participate, on DOT assisted contracts. The list must include all firms that bid on prime contracts, or bid or quote subcontracts and materials supplies on DOT-assisted projects, including both DBEs and non-DBEs. For consulting companies, this list must include all subcontractors the owner is proposing to use. The list must include all subcontractors contacting you and expressing an interest in teaming with you on a specific DOT-assisted project. Prime contractors and consultants must provide information for Nos. 1, 2, 3, and 4 and must provide information they have available on Numbers 5, 5A, 6, 7, 8 and 9 for themselves, and their subcontractors and subconsultants.

| 1. Federal Tax ID Number: 20-3135865 | 6. □ DBE |
| 2. Firm Name: BC Landscaping | □ Non-DBE |
| 3. Phone: 770.534.4724 | 7. □ Subcontractor |
| 4. Address: POB 1012 | 8. □ Subconsultant |
| 5. Contact: Jon Scroggs | 9. □ Supplier |
| 5A. Company Email address: jsrogges@bcimulching.com |

| 1. Federal Tax ID Number: 20-4315013 | 6. □ DBE |
| 2. Firm Name: Border Rebar LLC | □ Non-DBE |
| 3. Phone: 704.875.5313 | 7. □ Subcontractor |
| 4. Address: POB 12865 | 8. □ Subconsultant |
| 5. Contact: Bruce Rangel | 9. □ Supplier |
| 5A. Company Email address: estimating@borderrebar.com |

| 1. Federal Tax ID Number: 58-0649047 | 6. □ DBE |
| 2. Firm Name: Brooks Berry Haynie & Assoc. | □ Non-DBE |
| 3. Phone: 770.874.1162 | 7. □ Subcontractor |
| 4. Address: 600 Discovery Place | 8. □ Subconsultant |
| 5. Contact: Kevin Berkenkamp | 9. □ Supplier |
| 5A. Company Email address: kevin@bbhelectric.com |
FORM E
STATE OF GEORGIA DEPARTMENT OF TRANSPORTATION
CONSTRUCTION CONTRACTORS
BID OPPORTUNITY LIST

This information shall be submitted in accordance with ITP Section 1.8

| Prime Contractor/Consultant: Superior Construction Company Southeast, LLC |
| Address/Telephone Number: 7072 Business Park Blvd., Jacksonville, FL 32256 (904) 292-4240 |
| Bid/Proposal Number: P.I. No. 210327 |
| Quote Submitted MM/YY: September 2018 |

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| 1. Federal Tax ID Number: 58-2059870 |
| 2. Firm Name: Captain Rebar |
| 3. Phone: 770.307.7970 |
| 4. Address: 60 Windhaven Ct |
| Stockbridge, GA 30281 |
| 5. Contact: Henderson Dunlap |
| 5A. Company E-mail address: captainrebar@att.net |

| 1. Federal Tax ID Number: 74-2195234 |
| 2. Firm Name: CMC Rebar |
| 3. Phone: 704-965.3571 |
| 4. Address: 251 Rosea Rd |
| Lawrenceville, GA 30046 |
| 5. Contact: Randall Wood |
| 5A. Company E-mail address: randallwood@cmcrebar.com |

| 1. Federal Tax ID Number: 57-0974744 |
| 2. Firm Name: Curtin Trucking |
| 3. Phone: 704.586.7699 |
| 4. Address: 11900 Goodrich Dr |
| Charlotte, NC 28273 |
| 5. Contact: Nick Delaney |
| 5A. Company E-mail address: ndelaney@curtinco.com |

Georgia Department of Transportation
Page 1

Form E
**FORM E**

STATE OF GEORGIA DEPARTMENT OF TRANSPORTATION

<table>
<thead>
<tr>
<th>amp ruptors</th>
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<tbody>
<tr>
<td>Construction Contractors</td>
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<tr>
<td>Bid Opportunity List</td>
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This information shall be submitted in accordance with ITP **Section 1.8**

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<tr>
<th>Prime Contractor/Consultant: Superior Construction Company Southeast, LLC</th>
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<tbody>
<tr>
<td>Address/Telephone Number: 7072 Business Park Blvd., Jacksonville, FL 32256 (904) 292-4240</td>
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<td>Bid/Proposal Number: P. L. No. 210327</td>
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<tr>
<td>Quote Submitted MM/YY: September 2018</td>
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49 CFR Part 25.11 requires the Georgia Department of Transportation to develop and maintain a "bid opportunity list". The list is intended to be a listing of all firms participating or attempting to participate on DOT assisted contracts. The list must include all firms that bid on prime contracts, or bid for or quote subcontracts and materials supplies on DOT-assisted projects, including both DBEs and non-DBEs. For consulting companies, this list must include all subconsultants contacting you and expressing an interest in teaming with you on a specific DOT-assisted project. Prime contractors and consultants must provide information for Nos. 1, 2, 3, and 4 and must provide information they have available on Numbers 5, 6, 7, 8, and 9 for themselves, and their subcontractors and subconsultants.

<table>
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<tr>
<th>1. Federal Tax ID Number:</th>
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<tbody>
<tr>
<td>2. Firm Name:</td>
<td>Cymco 7</td>
</tr>
<tr>
<td>3. Phone:</td>
<td>678.709.3381</td>
</tr>
<tr>
<td>4. Address:</td>
<td>4535 Flat Shoals Plwy</td>
</tr>
<tr>
<td>Decatur, GA 30034</td>
<td></td>
</tr>
<tr>
<td>5. Contact: Edward Sims</td>
<td></td>
</tr>
<tr>
<td>5A. Company Email address: <a href="mailto:esims@cymco7inc.com">esims@cymco7inc.com</a></td>
<td></td>
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<tr>
<th>1. Federal Tax ID Number:</th>
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<tbody>
<tr>
<td>2. Firm Name:</td>
<td>D-Mac Industries</td>
</tr>
<tr>
<td>3. Phone:</td>
<td>770.954.7120</td>
</tr>
<tr>
<td>4. Address:</td>
<td>1880 D-Mac Drive</td>
</tr>
<tr>
<td>Alpharetta, GA 30004</td>
<td></td>
</tr>
<tr>
<td>5. Contact: Daniel McMorrow</td>
<td></td>
</tr>
<tr>
<td>5A. Company Email address: <a href="mailto:bfp@d-macindustries.com">bfp@d-macindustries.com</a></td>
<td></td>
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<th>1. Federal Tax ID Number:</th>
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<tbody>
<tr>
<td>2. Firm Name:</td>
<td>DS Brown Company</td>
</tr>
<tr>
<td>3. Phone:</td>
<td>419.297.3561</td>
</tr>
<tr>
<td>4. Address:</td>
<td>300 E. Cherry St</td>
</tr>
<tr>
<td>North Baltimore, OH 45872</td>
<td></td>
</tr>
<tr>
<td>5. Contact: Mark Francis</td>
<td></td>
</tr>
<tr>
<td>5A. Company Email address: <a href="mailto:mfrancis@dsbrown.com">mfrancis@dsbrown.com</a></td>
<td></td>
</tr>
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</table>
This information shall be submitted in accordance with ITP Section 1.8

Prime Contractor/Consultant: Superior Construction Company Southeast, LLC
Address/Telephone Number: 7072 Business Park Blvd, Jacksonville, FL 32256 (904) 292-4240
Bid/Proposal Number: P. I. No. 210327
Quote Submitted MM/YYYY: September 2018

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1. Federal Tax ID Number: 54-1780972
   6. DBE
2. Firm Name: DT Read Steel Co
   7. Subcontractor
3. Phone: 757.487.2047
   8. Subconsultant
4. Address: 1725 W. Road
   9. Supplier
   Chesapeake, VA 23323
5. Contact: Donnie Read
5A. Company Email address: donnie@dreadsteel.com

1. Federal Tax ID Number: 59-0763463
   6. DBE
2. Firm Name: Dura-Stress Inc.
   7. Subcontractor
3. Phone: 352.787.1422
   8. Subconsultant
4. Address: 11325 CR 44 E
   9. Supplier
   Leesburg, FL 34749
5. Contact: Glen Switzer
5A. Company Email address: gswitzer@durastress.com

1. Federal Tax ID Number: 57-1114354
   6. DBE
2. Firm Name: Enterprise Roof
   7. Subcontractor
3. Phone: 843.846.4082
   8. Subconsultant
4. Address: 150 Prescott Rd
   9. Supplier
   Yemassee, SC 29945
5. Contact: Ronald Smith
5A. Company Email address: enterpriserb@aol.com
This information shall be submitted in accordance with ITP Section 1.8

<table>
<thead>
<tr>
<th>Prime Contractor/Consultant</th>
<th>Superior Construction Company Southeast, LLC</th>
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<tbody>
<tr>
<td>Address/Telephone Number</td>
<td>7072 Business Park Blvd., Jacksonville, FL 32256 (904) 292-4240</td>
</tr>
<tr>
<td>Bid/Proposal Number</td>
<td>P. I. No. 210327</td>
</tr>
<tr>
<td>Quote Submitted MM/YY</td>
<td>September 2018</td>
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<td>2. Firm Name</td>
<td>Gerdau Ameristeel</td>
</tr>
<tr>
<td>3. Phone</td>
<td>704.399.9020</td>
</tr>
<tr>
<td>4. Address</td>
<td>301 Black Satchel Dr</td>
</tr>
<tr>
<td>5. Contact</td>
<td>Bill Graham</td>
</tr>
<tr>
<td>6. DBE</td>
<td></td>
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<tr>
<td>7. Non-DBE</td>
<td></td>
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<tr>
<td>8. Subcontractor</td>
<td></td>
</tr>
<tr>
<td>9. Supplier</td>
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<tr>
<td>Location</td>
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<th>1. Federal Tax ID Number</th>
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<tr>
<td>2. Firm Name</td>
<td>Gosalia Concrete Constructors</td>
</tr>
<tr>
<td>3. Phone</td>
<td>813.743.0964</td>
</tr>
<tr>
<td>4. Address</td>
<td>4507 N. 56th St</td>
</tr>
<tr>
<td>5. Contact</td>
<td>David Baker</td>
</tr>
<tr>
<td>6. DBE</td>
<td></td>
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<tr>
<td>7. Non-DBE</td>
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<td>8. Subcontractor</td>
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<tr>
<td>9. Supplier</td>
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<td>Location</td>
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<tr>
<td>2. Firm Name</td>
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</tr>
<tr>
<td>3. Phone</td>
<td>561-723-1456</td>
</tr>
<tr>
<td>4. Address</td>
<td>3104 E. 4th Ave</td>
</tr>
<tr>
<td>5. Contact</td>
<td>Mike Adams</td>
</tr>
<tr>
<td>6. DBE</td>
<td></td>
</tr>
<tr>
<td>7. Non-DBE</td>
<td></td>
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<tr>
<td>8. Subcontractor</td>
<td></td>
</tr>
<tr>
<td>9. Supplier</td>
<td></td>
</tr>
<tr>
<td>Location</td>
<td>Tampa, FL 33605</td>
</tr>
</tbody>
</table>
This information shall be submitted in accordance with ITP Section 1.8

1. Federal Tax ID Number: 35-1312982
2. Firm Name: Harrus Rebar
3. Phone: 803.328.3651
4. Address: 2753 S Anderson Rd

Catawba, SC 29704

5. Contact: Matt Thomas
5A. Company E-mail address: mathomas@harrusrebar.com

6. DBE
7. Non-DBE
8. Subcontractor
9. Subconsultant
10. Supplier

1. Federal Tax ID Number: 56-1026423
2. Firm Name: Herndon Inc.
3. Phone: 888.580.9282
4. Address: 1900 Whiting Way

Lugoff, SC 29076

5. Contact: J. Herndon
5A. Company E-mail address: jherndon44@herndoninc.com

6. DBE
7. Non-DBE
8. Subcontractor
9. Subconsultant
10. Supplier

1. Federal Tax ID Number: 65-0167126
2. Firm Name: J Mori Painting
3. Phone: 305.825.7144
4. Address: 2981 W 80th St

Hialeah, FL 33016

5. Contact: Joe Mori
5A. Company E-mail address: jlmori@moripainting.com

6. DBE
7. Non-DBE
8. Subcontractor
9. Subconsultant
10. Supplier

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| Prime Contractor/Consultant: Superior Construction Company Southeast, LLC |
|-----------------------------|-----------------------------|
| Address/Telephone Number: 7072 Business Park Blvd., Jacksonville, FL 32256 (904) 292-4240 |
| Bid/Proposal Number: P.I. No. 210327 |
| Quote Submitted MM/YY: September 2018 |

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1. Federal Tax ID Number: 56-1848578
2. Firm Name: Martin Marietta
3. Phone: 704-566-1471
4. Address: 11223 Texas Blvd.
   Charlotte, NC 28217
5. Contact: Brock Austin
5A. Company E-mail address: brock.austin@martinmarietta.com

1. Federal Tax ID Number: 26-2537796
2. Firm Name: Martin-Pinero CPM LLC
3. Phone: 678.705.7460
4. Address: 2531 Briandiff Rd., Suite 102
   Atlanta, GA 30329
5. Contact: Ana Martin
5A. Company E-mail address: amartin@martin-pinero.com

1. Federal Tax ID Number: 42-0402540
2. Firm Name: McCarthy Improvement Company
3. Phone: 804.882.2074
4. Address: 100 Hartsfield Centre Pkwy
   Atlanta, GA 30354
5. Contact: Lonnie Carroll
5A. Company E-mail address: lcarroll@mccarthyimprovement.com
This information shall be submitted in accordance with ITP Section 1.8

| Prime Contractor/Consultant: Superior Construction Company Southeast, LLC |
|-----------------------------|-----------------------------|
| Address/Telephone Number: 7072 Business Park Blvd., Jacksonville, FL 32256 (904) 292-4240 |
| Bid/Proposal Number: P. L. No. 210327 |
| Quote Submitted MM/YY: September 2018 |

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| 1. Federal Tax ID Number: 58-1620416 |
| 2. Firm Name: Mid State Construction |
| 3. Phone: 470-957-1722 |
| 4. Address: 140 Mark Thompson Rd |
| 5. Contact: Mark Massey |
| 5.A. Company E mail address: mmassey@midsales.com |

| 6. DBE |
| 7. Subcontractor |
| 8. Subconsultant |
| 9. Supplier |

| 1. Federal Tax ID Number: 35-2083989 |
| 2. Firm Name: New Millenium |
| 3. Phone: 803-824-0925 |
| 4. Address: 3700 Forrest Dr |
| 5. Contact: Gerald Arvey |
| 5.A. Company E mail address: geraldarvey@newmil.com |

| 6. DBE |
| 7. Subcontractor |
| 8. Subconsultant |
| 9. Supplier |

| 1. Federal Tax ID Number: 20-036-2023 |
| 2. Firm Name: Peak Service Co |
| 3. Phone: 706-393-5887 |
| 4. Address: POB 7337 |
| 5. Contact: Tammy Harbuck |
| 5.A. Company E mail address: tharbuck@peeksafety.com |

| 6. DBE |
| 7. Subcontractor |
| 8. Subconsultant |
| 9. Supplier |
FORM E
STATE OF GEORGIA DEPARTMENT OF TRANSPORTATION
CONSTRUCTION CONTRACTORS
BID OPPORTUNITY LIST

This information shall be submitted in accordance with ITP Section 1.8

| Prime Contractor/Consultant: Superior Construction Company Southeast, LLC |
| Address/Telephone Number: 7072 Business Park Blvd, Jacksonville, FL 32256 (904) 292-4240 |
| Bid/Proposal Number: P. I. No. 210327 |
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| 1. Federal Tax ID Number: 56-1358778 | 6. ☐ DBE |
| 2. Firm Name: Reynolds Fence & Guardrail | ☐ Non-DBE |
| 3. Phone: 704.763.4992 | 7. ☐ Subcontractor |
| 4. Address: 9320 Machado Dr | 8. ☐ Subconsultant |
| | 9. ☐ Supplier |
| Indian Trail, NC 28079 |
| 5. Contact: Tracy Jolly |
| 5 A. Company E mail address: tracy@reynoldsfenceandguardrail.com |

| 1. Federal Tax ID Number: 25-1084418 | 6. ☐ DBE |
| 2. Firm Name: Roadsafe Traffic Systems | ☐ Non-DBE |
| 3. Phone: 803.567.2185 | 7. ☐ Subcontractor |
| 4. Address: 1021 2nd Ave | 8. ☐ Subconsultant |
| | 9. ☐ Supplier |
| Columbia, SC 29209 |
| 5. Contact: Tino Garcia |
| 5 A. Company E mail address: tgarcia@roadsafetraffic.com |

| 1. Federal Tax ID Number: 91-0907093 | 6. ☐ DBE |
| 2. Firm Name: Scoquai Rubber Co | ☐ Non-DBE |
| 3. Phone: 775.884.8500 | 7. ☐ Subcontractor |
| 4. Address: 885 Denmark Dr. | 8. ☐ Subconsultant |
| | 9. ☐ Supplier |
| McCarran, NV 89434 |
| 5. Contact: Hans Swartzendruber |
| 5 A. Company E mail address: hane@scouglarubber.com |
This information shall be submitted in accordance with ITP Section 1.8

| Prime Contractor/Consultant: Superior Construction Company Southeast, LLC |
| Address/Telephone Number: 7072 Business Park Blvd, Jacksonville, FL 32256 (904) 292-4240 |
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| Quote Submitted MM/YY: September 2018 |

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| 1. Federal Tax ID Number: | 51-0119956 |
| 2. Firm Name: | SIP Inc. of Delaware |
| 3. Phone: | 302.654.4533 |
| 4. Address: | 1101 E. 8th St Wilmington, DE 19801 |
| 5. Contact: | Scott McKellar |
| 5.A. Company E mail address: | smckellar@wmsi.com |
| 6. | DBE |
| 7. | Subcontractor |
| 8. | Subconsultant |
| 9. | Supplier |

| 1. Federal Tax ID Number: | 45-3689782 |
| 2. Firm Name: | Southern States Pavement Markings |
| 3. Phone: | 904.314.8410 |
| 4. Address: | 1745 Lakeside Ave St. Augustine, FL 32084 |
| 5. Contact: | Melvin Carter |
| 5.A. Company E mail address: | mcarterameni@aol.com |
| 6. | DBE |
| 7. | Subcontractor |
| 8. | Subconsultant |
| 9. | Supplier |

| 1. Federal Tax ID Number: | 26-0362613 |
| 2. Firm Name: | Surface Prep Technologies |
| 3. Phone: | 717.697.1450 |
| 4. Address: | 81 Texaco Rd Mechanixburg, PA 17050 |
| 5. Contact: | Chandra Ulrich |
| 5.A. Company E mail address: | changra@surlprep.tech.com |
| 6. | DBE |
| 7. | Subcontractor |
| 8. | Subconsultant |
| 9. | Supplier |
This information shall be submitted in accordance with ITP Section 1.8

Prime Contractor/Consultant: Superior Construction Company Southeast, LLC
Address/Telephone Number: 7072 Business Park Blvd, Jacksonville, Fl 32256 (904) 292-4240
Bid/Proposal Number: P.I. No. 210327
Quote Submitted MM/YYYY: September 2016

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1. Federal Tax ID Number: 57-0958620
2. Firm Name: The Sharon Company
3. Phone: 803.957.3101
4. Address: POB 1366

Lexington, SC 29071
5. Contact: Scott Capps
5A. Company E mail address: estimates@sharoncompany.com

1. Federal Tax ID Number: 66-0863603
2. Firm Name: Topikal, Inc.
3. Phone: 404.266.0975
4. Address: 3155 Roswell Rd. NE

Atlanta, GA 30305
5. Contact: David Turner
5A. Company E mail address: topikal@aol.com

1. Federal Tax ID Number: 58-1092493
2. Firm Name: Blount Sanford Construction Co
3. Phone: 770.638.2959
4. Address: 5275 Webb Pkwy

Lilburn, GA
5. Contact: Jimmy Greason
5A. Company E mail address: jgreason@blountsanford.com
FORM E
STATE OF GEORGIA DEPARTMENT OF TRANSPORTATION
CONSTRUCTION CONTRACTORS
BID OPPORTUNITY LIST

This information shall be submitted in accordance with ITP Section 1.8

Prime Contractor/Consultant: Superior Construction Company Southeast, LLC
Address/Telephone Number: 7072 Business Park Blvd., Jacksonville, FL 32256 (904) 292-4240
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1. Federal Tax ID Number: 90-0113537
2. Firm Name: Ken Sandlin Welding
3. Phone: 772.461.8667
4. Address: 702 Winter Garden Pkwy

Fort Pierce, FL 34951

5. Contact: Ken Sandlin
5A. Company E mail address: ksandlin@hotmail.com

6. ☑ DBE
   6. ☐ Non-DBE
   7. ☑ Subcontractor
   8. ☐ Subconsultant
   9. ☐ Supplier

1. Federal Tax ID Number: 57-1191566
2. Firm Name: Florida Safety Contractors
3. Phone: 813.982.9172
4. Address: 11825 Jackson Rd

Thonotosassa, FL 33592

5. Contact: Cheri Reichart
5A. Company E mail address: c.reichart@floridasafetycontractors.com

6. ☑ DBE
   6. ☐ Non-DBE
   7. ☑ Subcontractor
   8. ☐ Subconsultant
   9. ☐ Supplier

FORM E
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<table>
<thead>
<tr>
<th>#</th>
<th>Federal Tax ID Number</th>
<th>Firm Name</th>
<th>Phone</th>
<th>Address</th>
<th>DBE</th>
<th>Non-DBE</th>
<th>Subcontractor</th>
<th>Subconsultant</th>
<th>Supplier</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>74-1202926</td>
<td>A.H. Beck</td>
<td>813.546.2225</td>
<td>6012 East Columbus Drive</td>
<td>6</td>
<td>8</td>
<td>9</td>
<td>8</td>
<td>9</td>
</tr>
<tr>
<td>2</td>
<td>81-1627846</td>
<td>America Foundation Inc</td>
<td>352.434.4090</td>
<td>252 W. Ardice Ave, Suite 317</td>
<td>6</td>
<td>7</td>
<td></td>
<td>8</td>
<td>9</td>
</tr>
<tr>
<td>3</td>
<td>39-1283086</td>
<td>Antigo Construction, Inc</td>
<td>715.623.2222</td>
<td>2520 North Clermont Street</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td></td>
<td>9</td>
</tr>
<tr>
<td>4</td>
<td><a href="mailto:scott.carroll@ahbeck.com">scott.carroll@ahbeck.com</a></td>
<td>Cornelius Whitehead</td>
<td><a href="mailto:CW@americanfoundationfl.com">CW@americanfoundationfl.com</a></td>
<td>252 W. Ardice Ave, Suite 317</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td></td>
<td>9</td>
</tr>
<tr>
<td>5</td>
<td>Jason Jansen</td>
<td><a href="mailto:jjansen@antigoconstruction.com">jjansen@antigoconstruction.com</a></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Tampa, FL 33619
Eustis, FL 32726
Antigo, WS 54409

Georgia Department of Transportation
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<tr>
<td>Address/Telephone Number</td>
<td>7072 Business Park Blvd., Jacksonville, FL 32256 (904) 292-4240</td>
</tr>
<tr>
<td>Bid/Proposal Number</td>
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<td>September 2018</td>
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1. Federal Tax ID Number: 58-1626327
2. Firm Name: Augusta Ready Mix
3. Phone: 706.733.9781
4. Address: 100 APAC Industrial Way

Augusta, GA 30907

5. Contact: Bill Burch
5A. Company Email address: b.burch@augustareadymix.com

1. Federal Tax ID Number: 57-0705449
2. Firm Name: Beam's Contracting, Inc.
3. Phone: 803.827.0136
4. Address: 15030 Atomic Road

Beech Island, SC 29842

5. Contact: Ricky Basye
5A. Company Email address: rbasye@beamscontracting.net

1. Federal Tax ID Number: 770-507-8611
2. Firm Name: Celebrity Fence Co. Inc
3. Phone: 770.507.8611
4. Address: 3735 George Washington Dr.

Ellenwood, GA 30294

5. Contact: Nathan Mainer
5A. Company Email address: mcfc@bellsouth.net
This information shall be submitted in accordance with ITP Section 1.8

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Address/Telephone Number: 7072 Business Park Blvd., Jacksonville, FL 32256 (904) 292-4240
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1. Federal Tax ID Number: called- no answer
2. Firm Name: Costello Industries
3. Phone: 770.806.2445
4. Address: 100 Bellamy Place

Stockbridge, GA 30281

5. Contact: R Brockman
5A. Company E mail address: rbrockman@costelloindustries.com

6. DBE
7. Subcontractor
8. Subconsultant
9. Supplier

1. Federal Tax ID Number: not working number
2. Firm Name: D & D Concrete Cutting
3. Phone: 919.724.3842
4. Address: 8402 Polaris Drive

Bahama, NC 27503

5. Contact: Don Murray
5A. Company E mail address: no email address

6. DBE
7. Subcontractor
8. Subconsultant
9. Supplier

1. Federal Tax ID Number: Did not want to provide
2. Firm Name: Dowel Bars and Baskets, LLC
3. Phone: 816.994.9090
4. Address: 1511 Baltimore Ave

Kansas City, Missouri, 64108

5. Contact: Matt Nicholas
5A. Company E mail address: mnicholas@dowelbarsbasket.com

6. DBE
7. Subcontractor
8. Subconsultant
9. Supplier
This information shall be submitted in accordance with ITP Section 1.8

Prime Contractor/Consultant: Superior Construction Company Southeast, LLC
Address/Telephone Number: 7972 Business Park Blvd, Jacksonville, FL 32256 (904) 292-4240
Bid/Proposal Number: P.I. No. 210327
Quote Submitted MM/YY: September 2018

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1. Federal Tax ID Number: 46-3185226
   6. ☑ DBE
   6A. No DBE

2. Firm Name: Landmark Civil Service
   7. ☑ Subcontractor
   7A. Non-DBE

3. Phone: 863.967.3992
   8. ☑ Subconsultant
   8A. Supplier

4. Address: 5578 Commercial Blvd.
   9. ☑ Supplier
   9A. Subcontractor

Winterhaven, FL 33880
5. Contact: Dana Gilespie
   5A. Company E mail address: danagilespie@qarrardinc.com

1. Federal Tax ID Number: No answer
   6. ☑ DBE
   6A. No DBE

2. Firm Name: Georgia- Lina Precast
   7. ☑ Subcontractor
   7A. Non-DBE

3. Phone: 803.232.7911
   8. ☑ Subconsultant

4. Address: 100 Woodward Lake Rd.
   9. ☑ Supplier
   9A. Subcontractor

Trenton, SC 29847
5. Contact: Robert Miller
   5A. Company E mail address: rmiller@georgiaprecast.com

1. Federal Tax ID Number: 59-3749585
   6. ☑ DBE
   6A. Non-DBE

2. Firm Name: Highway Specialties
   7. ☑ Subcontractor
   7A. Non-DBE

3. Phone: 850.256.3397
   8. ☑ Subconsultant

4. Address: 2961 South Pine Barren Road
   9. ☑ Supplier
   9A. Subconsultor

McDavid, FL 32568
5. Contact: Jan Nicholson
   5A. Company E mail address: jan@highwayspecialtiesinc.com
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1. Federal Tax ID Number: no response 6. DBE
2. Firm Name: Interstate Sealant & Concrete, Inc 7. Non-DBE
3. Phone: 262.547.6316 8. Subcontractor
4. Address: S40W24211 Rockwood Way 9. Supplier

Waukesha, WI 53189

5. Contact: Sean Leppert
5A. Company Email address sleppert@interstate sealant.com

1. Federal Tax ID Number: will not provide 6. DBE
2. Firm Name: J. Moore Electrical 7. Non-DBE
3. Phone: 803.568.4734 8. Subcontractor

Swansea, SC 29160

5. Contact
5A. Company Email address jme04@comporium.net

1. Federal Tax ID Number: Not able to provide 6. DBE
2. Firm Name: J.R. Steel LLC 7. Non-DBE
3. Phone: 843.225.4545 8. Subcontractor
4. Address: P.O. Box 9. Supplier

Charleston, SC 29416

5. Contact: Jamal Magwood
5A. Company Email address jamal@jrsteel-lcc.com
This information shall be submitted in accordance with ITP Section 1.8

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Address/Telephone Number: 7072 Business Park Blvd., Jacksonville, FL 32256 (904) 292-4240
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1. Federal Tax ID Number: 58-1353973
   2. Firm Name: Key Curbing and Paving
   3. Phone: 770.922.6833
   4. Address: 2600 Keys Pointe SE
   5. Contact: Danny Perry
   6. DBE
   7. Subcontractor
   8. Subconsultant
   9. Supplier

Conyers, GA 30013
5A. Company Email address: drpkeycurb@bellsouth.net

1. Federal Tax ID Number: 57-0938700
   2. Firm Name: Lee & Smims Drilling Services
   3. Phone: 864.245.2682
   4. Address: 10659 Augusta Rd
   5. Contact: Donald Sims
   6. DBE
   7. Subcontractor
   8. Subconsultant
   9. Supplier

Belton, SC 29627
5A. Company Email address: dsims@leeandsims.com

1. Federal Tax ID Number: no response
   2. Firm Name: Maner
   3. Phone: 706.853.6191
   4. Address: 3801 Martinez Blvd
   5. Contact: Susan Bafford
   6. DBE
   7. Subcontractor
   8. Subconsultant
   9. Supplier

Augusta, GA 30907
5A. Company Email address: susan.bafford@maner.com
FORM E
STATE OF GEORGIA DEPARTMENT OF TRANSPORTATION
CONSTRUCTION CONTRACTORS
BID OPPORTUNITY LIST

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1. Federal Tax ID Number: 47-2484263
2. Firm Name: Master Dowel
3. Phone: 515.777.2939
4. Address: 718 SE Shurfine Dr.

Ankeny, IA 50021

5. Contact: Brad Zau
5A. Company Email address: brad@masterdowel.com

1. Federal Tax ID Number: 33-0349226
2. Firm Name: Penhall Company
3. Phone: 770.941.3201
4. Address: 6940 Oak Ridge Parkway

Austell, GA 30168

5. Contact: John Depman
5A. Company Email address: kdepman@penhall.com

1. Federal Tax ID Number: No response
2. Firm Name: Pro Grade South
3. Phone: 912.751.3052
4. Address: 1971 Stillwell Clwy Rd

Springfield, GA 31329

5. Contact: Bo Langham
5A. Company Email address: 
This information shall be submitted in accordance with ITP Section 1.8

1. Federal Tax ID Number: 56-0791580
2. Firm Name: S & ME Inc
3. Phone: 708-729-8917
4. Address: 1732 Wylds Rd
5. Contact: Maria Swindler
5A. Company Email address: mswindler@smeinc.com

1. Federal Tax ID Number: 38-2625522
2. Firm Name: SCodeller Construction
3. Phone: 248-374-1102
4. Address: 51722 Grand Silver
5. Contact: Ron Budd
5A. Company Email address: ron@scodellerconstruction.com

1. Federal Tax ID Number: 27-1679920
2. Firm Name: Southeast Grinding & Grooving
3. Phone: 404-803-5397
4. Address: 549 Goose Ridge SW
5. Contact: Stephan Frame
5A. Company Email address: sframe@sglinc.com
**Georgia Department of Transportation**
**P.I. No. 210327 -- I-20 at Savannah River Design-Build Project**

**Amendment 2 Issued: August 31, 2018**

---

**FORM E**

**STATE OF GEORGIA DEPARTMENT OF TRANSPORTATION**
**CONSTRUCTION CONTRACTORS**
**BID OPPORTUNITY LIST**

PREQUALIFICATION OFFICE
Revised 05/16/11

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This information shall be submitted in accordance with ITP Section 1.8

Prime Contractor/Consultant: Superior Construction Company Southeast, LLC  
Address/Telephone Number: 7072 Business Park Blvd., Jacksonville, FL 32256 (904) 292-4240  
Bid/Proposal Number: P.I. No. 210327  
Quote Submitted MM/YY: September 2018

49 CFR Part 26.11 requires the Georgia Department of Transportation to develop and maintain a "bid opportunity list". The list is intended to be a listing of all firms participating or attempting to participate, on DOT assisted contracts. The list must include all firms that bid on prime contracts, or bid on subcontracted contracts and materials supplied on DOT-assisted projects, including both DBEs and non-DBEs. For consulting companies, this list must include all subconsultants contacting you and expressing an interest in teaming with you on a specific DOT assisted project. Prime contractors and consultants must provide information on all DBEs and non-DBEs for themselves, and their subcontractors and subconsultants for Numbers 1, 2, 3, and 4 and must provide information they have available on Numbers 5, 6, 7, 8, and 9 for themselves, and their subcontractors and subconsultants.

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<tr>
<td>1.</td>
<td>42-1752131</td>
<td>Southern Commercial Development</td>
<td>603.808.0232</td>
<td>1326 S. Lake Drive</td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>58-2262101</td>
<td>Sowell Dodson</td>
<td>770.896.9177</td>
<td>70 Macon Street</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>35-2110733</td>
<td>Specialties Company, LLC</td>
<td>317.594.0291</td>
<td>9350 E. 30th St</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

---

Contact: Shera Evans  
Company Email address: sevans@scdevelopmentllc.com

Contact: Danny  
Company Email address: dh.so-do@earthlink.net

Contact: Dave Gunn  
Company Email address: david.gunn@specialtiescompany.com

---

Georgia Department of Transportation  
Page 1  
Form E
FORM E
STATE OF GEORGIA DEPARTMENT OF TRANSPORTATION
CONSTRUCTION CONTRACTORS
BID OPPORTUNITY LIST
PREQUALIFICATION OFFICE
Revised 05/16/11

This information shall be submitted in accordance with ITP Section 1.8

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1. Federal Tax ID Number: Won't Provide
   2. Firm Name: Stay Alert Safety Services Inc
   3. Phone: 336.993.2828
   4. Address: 272 Clayton Forest Rd
   Kernersville, NC 27284
   5. Contact: Jeff Foose
   5A. Company Email address: jfoose@stayalbertsafety.com
   6. DBE

1. Federal Tax ID Number: No response
   2. Firm Name: The Erosion Company
   3. Phone: 678.990.0207
   4. Address: 3207 S. Cherokee Lane, Ste 4
   Woodstock, GA 30188
   5. Contact: Darrell Sheets
   5A. Company Email address: dsheets@telecompanies.com
   6. DBE

1. Federal Tax ID Number: 54.2121743
   2. Firm Name: TMC Grassing
   3. Phone: 678.342.6139
   4. Address: 4670 Guthrie Cemetary Rd
   Loganville, GA 30052
   5. Contact: Butch
   5A. Company Email address: butch@tmcgrassing.com
   6. DBE
This information shall be submitted in accordance with ITP Section 1.8

Prime Contractor/Consultant: Superior Construction Company Southeast, LLC
Address/Telephone Number: 7072 Business Park Blvd., Jacksonville, FL 32256 (904) 292-4240
Bid/Proposal Number: P. I. No. 210327
Quote Submitted: MM/YY: September 2018

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1. Federal Tax ID Number: no response 6. DBE
2. Firm Name: Triad Supply and Services 7. Non-DBE
3. Phone: 912.858.2231 8. Subcontractor
4. Address: 255 Little Creek Rd. 9. Subconsultant
Pembroke, GA 31321 5. Contact: Bea Bacon 5A. Company E-mail address: no email address

1. Federal Tax ID Number: 57-0661697 6. DBE
2. Firm Name: Walker Brothers, Inc 7. Non-DBE
3. Phone: 803.359.2839 8. Subcontractor
4. Address: 915 Bar 9. Subconsultant
Lexington, SC 29071 5. Contact: Vance Sullivan 5A. Company E-mail address: vance@walkersignals.com

1. Federal Tax ID Number: called- no response 6. DBE
2. Firm Name: Big Dog Disposal Services, Inc 7. Non-DBE
3. Phone: 706.447.8787 8. Subcontractor
4. Address: P.O. Box 211083 9. Subconsultant
Martinez, GA 30917 5. Contact: 5A. Company E-mail address: bigdogdisposal.com

Georgia Department of Transportation

Page 1
FORM E
STATE OF GEORGIA DEPARTMENT OF TRANSPORTATION
CONSTRUCTION CONTRACTORS
BID OPPORTUNITY LIST

This information shall be submitted in accordance with ITP Section 1.8

Prime Contractor/Consultant: Superior Construction Company Southeast, LLC
Address/Telephone Number: 7072 Business Park Blvd, Jacksonville, FL 32256 (904) 292-4240
Bid/Proposal Number: P.I. No. 210327
Quote Submitted MM/YY: September 2018

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1. Federal Tax ID Number: 80-35083227
2. Firm Name: G.L. Williams & Daughter Trucking Co. Inc.
3. Phone: 803.663.3715
4. Address: 501 Rainbow Rd
5. Contact
6. DBE
7. Subcontractor
8. Subconsultant
9. Supplier

Graniteville, SC 29829

5.A. Company E-mail address

1. Federal Tax ID Number: 58-1875812
2. Firm Name: Transportation Safety Products
3. Phone: 770.962.2222
4. Address: 1629 Spectrum Drive
5. Contact: Lisa Brown
6. DBE
7. Subcontractor
8. Subconsultant
9. Supplier

Lawrenceville, GA 30043

5.A. Company E-mail address: lisa@transsafeproducts.com

1. Federal Tax ID Number: No response
2. Firm Name: Wilkes Concrete Co. Inc
3. Phone: 229.324.2377
4. Address: 6832 Old Adel Rd.
5. Contact: Toby Wilkes
6. DBE
7. Subcontractor
8. Subconsultant
9. Supplier

Moultrie GA 31788

5.A. Company E-mail address: wilkesconcrete6832@gmail.com
This information shall be submitted in accordance with ITP Section 1.8

Prime Contractor/Consultant: Superior Construction Company Southeast, LLC  
Address/Telephone Number: 7072 Business Park Blvd, Jacksonville, FL 32256 (904) 292-4240  
Bid/Proposal Number: P.I. No. 210327  
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<td>1. Federal Tax ID Number:</td>
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<td>6.</td>
<td>DBE</td>
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<tr>
<td>2. Firm Name:</td>
<td>RRB Trucking LLC</td>
<td>7.</td>
<td>Non-DBE</td>
</tr>
<tr>
<td>3. Phone:</td>
<td>762.272.7152</td>
<td>8.</td>
<td>Subcontractor</td>
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<td>4. Address:</td>
<td>1771 Dixon Airline Rd</td>
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<td>Supplier</td>
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<td></td>
<td>Augusta, GA 30906</td>
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<tr>
<td>5. Contact:</td>
<td>Ruby Jenkins-Basey</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5A. Company E mail address:</td>
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<tr>
<td>2. Firm Name:</td>
<td>The Sharon Company</td>
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<td>Non-DBE</td>
</tr>
<tr>
<td>3. Phone:</td>
<td>803.957.3101</td>
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<td>Subcontractor</td>
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<tr>
<td>4. Address:</td>
<td>P.O. Box 1366</td>
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<td></td>
<td>Lexington, SC 29071</td>
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</tr>
<tr>
<td>5. Contact:</td>
<td>Sharon</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5A. Company E mail address:</td>
<td><a href="mailto:sharon@sharoncompany.com">sharon@sharoncompany.com</a></td>
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<td>DBE</td>
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<td>3. Phone:</td>
<td>706.722.1432</td>
<td>8.</td>
<td>Subcontractor</td>
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<tr>
<td>4. Address:</td>
<td>P.O. Box 932</td>
<td>9.</td>
<td>Supplier</td>
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<td></td>
<td>Augusta, GA 3903</td>
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<tr>
<td>5. Contact:</td>
<td>813-207-2101</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5A. Company E mail address:</td>
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Georgia Department of Transportation P.I. No. 210327 -- I-20 at Savannah River Design-Build Project Amendment 2 Issued: August 31, 2018

FORM E
STATE OF GEORGIA DEPARTMENT OF TRANSPORTATION FORM EEOP
CONSTRUCTION CONTRACTORS
BID OPPORTUNITY LIST

PREQUALIFICATION OFFICE
Revised 05/16/11

This information shall be submitted in accordance with ITP Section 1.8

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| Address/Telephone Number: 7072 Business Park Blvd, Jacksonville, FL 32256 (904) 292-4240 |
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| Quote Submitted MM/YY: September 2018 |

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| 1. Federal Tax ID Number: 57-0340619 | 6. ☐ DBE |
| 2. Firm Name: Shugart Manufacturing | ☑ Non-DBE |
| 3. Phone: 803.581.5191 | 7. ☐ Subcontractor |
| 4. Address: 919 Old York Road | 8. ☐ Subconsultant |
| | 9. ☑ Supplier |
| Chester, SC 29706 |
| 5. Contact: Donald Wilks |
| 5A. Company E-mail address |

| 1. Federal Tax ID Number: 35-1700866 | 6. ☐ DBE |
| 2. Firm Name: Poseidon Barge, Ltd | ☑ Non-DBE |
| 3. Phone: 219.866.3728 | 7. ☐ Subcontractor |
| 4. Address: 725 E. Parr Road | 8. ☐ Subconsultant |
| | 9. ☑ Supplier |
| Berne, IN 46711 |
| 5. Contact: Mike Lane |
| 5A. Company E-mail address: mlane@poseidonbarge.com |

| 1. Federal Tax ID Number: 45-2730152 | 6. ☑ DBE |
| 2. Firm Name: Ten 4 Hauling LLC | ☑ Non-DBE |
| 3. Phone: 706.294.0358 | 7. ☐ Subcontractor |
| 4. Address: 611 Huntington Dr | 8. ☐ Subconsultant |
| | 9. ☑ Supplier |
| Augusta, GA 30909 |
| 5. Contact: Robert estimating |
| 5A. Company E-mail address: ten4hauling@yahoo.com |

Georgia Department of Transportation Form E
This information shall be submitted in accordance with ITP Section 1.8

1. Federal Tax ID Number: 62-0812218
2. Firm Name: Gilley Construction, Inc
3. Phone: 931.728.3296
4. Address: 4741 Murfreesboro Hwy

Manchester, TN 37355

5. Contact: David Carr
5.A. Company E-mail address: davidcarr@gilleyconstruction.com

1. Federal Tax ID Number: called- no response
2. Firm Name: Kelly Rebar Contractor, Inc
3. Phone: 
4. Address: 4015 Forest Drive Ste 201

Columbia, SC 29204

5. Contact: Shirley Kelly
5.A. Company E-mail address: firebar@yahoo.com

1. Federal Tax ID Number: 20-0594157
2. Firm Name: McNary Bergeron Engineering
3. Phone: 813.777.3144
4. Address: 10014 N. Dale Mabry Hwy Ste 222

Tampa, FL 33618

5. Contact: Tim Davis
5.A. Company E-mail address: tdavis@mcnarybergeron.com

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| Address/Telephone Number: 7072 Business Park Blvd., Jacksonville, FL 32256 (904) 292-4240 |
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1. Federal Tax ID Number: called- no response 6. DBE
2. Firm Name: The Delaney Company LLC 7. Non-DBE
3. Phone: 404.414.6089 8. Subcontractor
4. Address: 1205 Johnson Ferry Road, Ste 136 9. Supplier
   Marietta, GA 30068
5. Contact: Joanellen Smith
5A. Company E-mail address: joannelensmith@gmail.com

1. Federal Tax ID Number: 57-0870792 6. DBE
2. Firm Name: Charleston Rigging 7. Non-DBE
3. Phone: 843.723.7145 8. Subcontractor
4. Address: 1210 Tru XCT Ave. 9. Supplier
   North Charleston SC 29405
5. Contact: Ed Tgikerson
5A. Company E-mail address: etigikerson@charlestonrigging.com

1. Federal Tax ID Number: 58-0807745 6. DBE
3. Phone: 770.985.0600 8. Subcontractor
4. Address: 1785 Oak Road 9. Supplier
   Snellville, GA 30078
5. Contact: Call- estimating
5A. Company E-mail address: www.ersnell.com
This information shall be submitted in accordance with ITP Section 1.8

Prime Contractor/Consultant: Superior Construction Company Southeast, LLC
Address/Telephone Number: 7072 Business Park Blvd., Jacksonville, FL 32256 (904) 292-4240
Bid/Proposal Number: P.I. No. 210327
Quote Submitted MM/YY: September 2018

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1. Federal Tax ID Number: [called- no response]
2. Firm Name: Maxim Crane Works
3. Phone: 803.391.1883
4. Address: 1560 Veterans Memorial Hwy

Mableton, GA 30126

5. Contact: Steve Ricker
5A. Company E-mail address: sricker@maximcrane.com

1. Federal Tax ID Number: 47-1003833
2. Firm Name: Atlantic Meridian Contracting Corp
3. Phone: 843.276.9589
4. Address: 1075 Peachtree Street NE

Atlanta, GA 30309

5. Contact: Kenneth Canty
5A. Company E-mail address: kcanty@freelandconstruction.com

1. Federal Tax ID Number: [called- no response]
2. Firm Name: WSP USA, Inc
3. Phone: 404.237.2115
4. Address: 3340 Peachtree RD

Atlanta GA 30326

5. Contact: Denny Meier
5A. Company E-mail address:
This information shall be submitted in accordance with ITP Section 1.8

1. Federal Tax ID Number: 45-2730152
2. Firm Name: Mealing Ventures, LLC
3. Phone: 706.840.4409
4. Address: 2948 Rollingwood Drive

Augusta, GA 30906

5. Contact: Alan Mealing
5A. Company Email Address: abmealing@gmail.com

1. Federal Tax ID Number: called- no response
2. Firm Name: CMC Construction Services
3. Phone: 513.503.0016
4. Address: 18909 Highland Rd

Baton Rouge, LA 70809

5. Contact: Beau Peterson
5A. Company Email Address

1. Federal Tax ID Number: 26-1171128
2. Firm Name: CSI Geo
3. Phone: 904.641.1993
4. Address: 2394 St. Johns Bluff Road South

Jacksonville, FL 32246

5. Contact: Shane Whittier
5A. Company Email Address: swhittler@csi-geo.com
This information shall be submitted in accordance with ITP Section 1.8

<table>
<thead>
<tr>
<th>Prime Contractor/Consultant</th>
<th>Superior Construction Company Southeast, LLC</th>
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<tbody>
<tr>
<td>Address/Telephone Number</td>
<td>7072 Business Park Blvd., Jacksonville, FL 32256 (904) 292-4240</td>
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<tr>
<td>Bid/Proposal Number</td>
<td>P.I. No. 210327</td>
</tr>
<tr>
<td>Quote Submitted MM/YYYY</td>
<td>September 2018</td>
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1. Federal Tax ID Number: will not give out
2. Firm Name: Augusta Iron & Steel Works, Inc
3. Phone: 706.860.7719
4. Address: 3781 Martinez Blvd
Augusta, GA 30907
5. Contact: Robert Bovard
5A. Company Email address

<table>
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<tr>
<th>Prime Contractor/Consultant</th>
<th>McRae Ready Mix</th>
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<tbody>
<tr>
<td>Address/Telephone Number</td>
<td>706.823.4430</td>
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<tr>
<td>Bid/Proposal Number</td>
<td>140 Spring Ave</td>
</tr>
<tr>
<td>Quote Submitted MM/YYYY</td>
<td>McRae GA 31055</td>
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5. Contact: Hank Bridges
5A. Company Email address: hbrides@argos-us.com

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<thead>
<tr>
<th>Prime Contractor/Consultant</th>
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<tr>
<td>Address/Telephone Number</td>
<td>706.535.5351</td>
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<tr>
<td>Bid/Proposal Number</td>
<td>204 Main Street</td>
</tr>
<tr>
<td>Quote Submitted MM/YYYY</td>
<td>Thomson GA 30824</td>
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5. Contact: Josh Newsome
5A. Company Email address: josh@candhpaving.com

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<th>Prime Contractor/Consultant</th>
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<td>Bid/Proposal Number</td>
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<td>Quote Submitted MM/YYYY</td>
<td>Thomson GA 30824</td>
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</table>
5. Contact: Josh Newsome
5A. Company Email address: josh@candhpaving.com
This information shall be submitted in accordance with ITP Section 1.8

1. Federal Tax ID Number: 63-0575531 6. DBE
2. Firm Name: Russo Corporation 6. Non-DBE
3. Phone: 205.902.9559 7. Subcontractor
4. Address: 1421 Mims Ave. S.W. 8. Subconsultant
5. Contact: Harris Wilson 9. Supplier
5A. Company E-mail address: hwilson@russcorp.com

---

1. Federal Tax ID Number: 47-4009373 6. DBE
2. Firm Name: Road Runner Highway Signs, LLC 6. Non-DBE
3. Phone: 865.329.1059 7. Subcontractor
4. Address: 5310 Counselor Lane 8. Subconsultant
5. Contact: Joe DeLaGarza 9. Supplier
5A. Company E-mail address: joerrhsi.com

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Georgia Department of Transportation

Page 1
FORM H

Equal Employment Opportunity Certification

[To be executed by the Proposer, Participating Members, Major Non-Participating Members and proposed Contractors]

The undersigned certifies on behalf of Superior Construction Company Southeast, LLC, that:

(Name of entity making certification)

[check one of the following boxes]

☐ It has developed and has on file at each establishment affirmative action programs pursuant to 41 CFR Part 60-2 (Affirmative Action Programs).

☐ It is not subject to the requirements to develop an affirmative action program under 41 CFR Part 60-2 (Affirmative Action Programs).

[check one of the following boxes]

☐ It has not participated in a previous contract or subcontract subject to the equal opportunity clause described in Executive Orders 10925, 11114 or 11246.

☒ It has participated in a previous contract or subcontract subject to the equal opportunity clause described in Executive Orders 10925, 11114 or 11246 and, where required, it has filed with the Joint Reporting Committee, the Director of the Office of Federal Contract Compliance, a Federal Government contracting or administering agency, or the former President's Committee on Equal Employment Opportunity, all reports due under the applicable filing requirements.

Signature: __________________________

Title: President

Date: 09/21/2018

If not the Proposer, relationship to the Proposer: N/A

Note: The above certification is required by the Equal Employment Opportunity Regulations of the Secretary of Labor (41 CFR 60-1.7(b)(1)), and must be submitted by Proposers only in connection with contracts which are subject to the equal opportunity clause. Contracts that are exempt from the equal opportunity clause are set forth in 41 CFR 60-1.5. (Generally, only contracts of $10,000 or under are exempt.)

Currently, Standard Form 100 (EEO-1) is the only report required by Executive Orders or their implementing regulations.

Proposers, Participating Members, Major Non-Participating Members or proposed Contractors who have participated in a previous contract subject to the Executive Orders and have not filed the required reports shall note that 41 CFR 60-1.7(b)(1) prevents the award of contracts and subcontracts unless such contractor submits a report covering the delinquent period or such other period specified by the Federal Highway Administration or by the Director, Office of Federal Contract Compliance, U.S. Department of Labor.
FORM H

Equal Employment Opportunity Certification

[To be executed by the Proposer, Participating Members, Major Non-Participating Members and proposed Contractors]

The undersigned certifies on behalf of WSP USA Inc., that:

(Name of entity making certification)

[check one of the following boxes]

☑ It has developed and has on file at each establishment affirmative action programs pursuant to 41 CFR Part 60-2 (Affirmative Action Programs).

☐ It is not subject to the requirements to develop an affirmative action program under 41 CFR Part 60-2 (Affirmative Action Programs).

[check one of the following boxes]

☐ It has not participated in a previous contract or subcontract subject to the equal opportunity clause described in Executive Orders 10925, 11114 or 11246.

☑ It has participated in a previous contract or subcontract subject to the equal opportunity clause described in Executive Orders 10925, 11114 or 11246 and, where required, it has filed with the Joint Reporting Committee, the Director of the Office of Federal Contract Compliance, a Federal Government contracting or administering agency, or the former President's Committee on Equal Employment Opportunity, all reports due under the applicable filing requirements.

Signature: __________________________
Title: Claudia Bilotto, AICP, Vice President/Area Manager
Date: September 20, 2018

If not the Proposer, relationship to the Proposer: Lead Design Consultant/Engineer of Record Georgia

Note: The above certification is required by the Equal Employment Opportunity Regulations of the Secretary of Labor (41 CFR 60-1.7(b)(1)), and must be submitted by Proposers only in connection with contracts which are subject to the equal opportunity clause. Contracts that are exempt from the equal opportunity clause are set forth in 41 CFR 60-1.5. (Generally, only contracts of $10,000 or under are exempt.)

Currently, Standard Form 100 (EEO-1) is the only report required by Executive Orders or their implementing regulations.

Proposers, Participating Members, Major Non-Participating Members or proposed Contractors who have participated in a previous contract subject to the Executive Orders and have not filed the required reports shall note that 41 CFR 60-1.7(b)(1) prevents the award of contracts and subcontracts unless such contractor submits a report covering the delinquent period or such other period specified by the Federal Highway Administration or by the Director, Office of Federal Contract Compliance, U.S. Department of Labor.
FORM H

Equal Employment Opportunity Certification

[To be executed by the Proposer, Participating Members, Major Non-Participating Members and proposed Contractors]

The undersigned certifies on behalf of _______ STV Incorporated ________ that:

(Name of entity making certification)

[check one of the following boxes]

☒ It has developed and has on file at each establishment affirmative action programs pursuant to 41 CFR Part 60-2 (Affirmative Action Programs).

☐ It is not subject to the requirements to develop an affirmative action program under 41 CFR Part 60-2 (Affirmative Action Programs).

[check one of the following boxes]

☐ It has not participated in a previous contract or subcontract subject to the equal opportunity clause described in Executive Orders 10925, 11114 or 11246.

☒ It has participated in a previous contract or subcontract subject to the equal opportunity clause described in Executive Orders 10925, 11114 or 11246 and, where required, it has filed with the Joint Reporting Committee, the Director of the Office of Federal Contract Compliance, a Federal Government contracting or administering agency, or the former President’s Committee on Equal Employment Opportunity, all reports due under the applicable filing requirements.

Signature: __________________________

Title: E. Richard Capps, Jr., P.E./Senior Vice President

Date: September 19, 2018

Major subconsultant to WSP USA Inc.

If not the Proposer, relationship to the Proposer: Engineer of Record South Carolina

Note: The above certification is required by the Equal Employment Opportunity Regulations of the Secretary of Labor (41 CFR 60-1.7(b)(1)), and must be submitted by Proposers only in connection with contracts which are subject to the equal opportunity clause. Contracts that are exempt from the equal opportunity clause are set forth in 41 CFR 60-1.5. (Generally, only contracts of $10,000 or under are exempt.)

Currently, Standard Form 100 (EEO-1) is the only report required by Executive Orders or their implementing regulations.

Proposers, Participating Members, Major Non-Participating Members or proposed Contractors who have participated in a previous contract subject to the Executive Orders and have not filed the required reports shall note that 41 CFR 60-1.7(b)(1) prevents the award of contracts and subcontracts unless such contractor submits a report covering the delinquent period or such other period specified by the Federal Highway Administration or by the Director, Office of Federal Contract Compliance, U.S. Department of Labor.
FORM I

DBE Certification

DISADVANTAGED BUSINESS ENTERPRISES REQUIREMENTS

The following Project goal for participation by DBEs is established for professional services and construction work:

**DBE GOAL**

11% of the overall Project design and construction costs, with respect to the race conscious participation by the Design-Build Team.

**DBE Certification**

By signing below, the Proposer certifies that (1) the Design-Build Team will provide a good faith effort to meet the goal; and (2) the Design-Build Team will direct its efforts toward the utilization of DBE firms in both design and construction components of the Project, (3) the Design-Build Team will submit a DBE Commitments List meeting the requirements set forth in Attachment 6 to Exhibit 8 to the DBA, (4) the Design-Build Team will submit monthly and annual summary reports of the DBE goal attainment on the Project, identifying the components of the Project on which DBE firms are/have been utilized. See the following page of this form for the Commitments List requirements.

Failure to submit the DBE Commitments List will be considered a breach of the requirements of the RFP. As a result, the Proposal Bond provided by the Proposer will become property of GDOT and the Proposer will be precluded from participating in any re-procurement of the DBA for the Project.

[Signature] Pete Kelley

(name)

President

(title)
The DBE firms to be utilized as counting toward the proposed goal must be listed on this form, along with their addresses, type of work and the amount to be paid to each of the certified DBE firms. The amount entered will not necessarily be the contract amount, but must be the actual amount that will be paid to the DBE firm. In the case of a DBE supplier, the amount paid and 60% of that amount both will be entered; and only the 60% figure should be added to the total. An example of this is shown in Table I-1:

Table I-1: Example Commitments Chart

<table>
<thead>
<tr>
<th>Vendor Number</th>
<th>Company Name and Address (City and State)</th>
<th>Type of Work</th>
<th>Code</th>
<th>Race Neutral</th>
<th>Race Conscious</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ABC Oil Company Atlanta, GA</td>
<td>Diesel Fuel Supplier</td>
<td></td>
<td></td>
<td></td>
<td>$80,000.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(60% = $48,000.00)</td>
</tr>
</tbody>
</table>

The Contractor shall indicate for each DBE and Type of Work whether the DBE Participant is Race Neutral or Race Conscious by placing a checkmark in the appropriate column.

**PLEASE NOTE:** For 60% of the amount paid to a DBE supplier to be eligible to count toward fulfilling the DBE goal, the supplier must be an established "regular dealer" in the product involved, and not just a broker. A "regular dealer" would normally sell the product to several customers and would usually have product inventory on hand.
<table>
<thead>
<tr>
<th>Vendor Number</th>
<th>Company Name &amp; Address (City and State)</th>
<th>Type of Work</th>
<th>*Work Code</th>
<th>Race Neutral</th>
<th>Race Conscious</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>2LO352</td>
<td>Long Engineering, 2550 Heritage Court SE, Suite 250 Atlanta, GA 30339</td>
<td>Survey, SUE, Util. Coord., Bridg Design Rev. Doc Control</td>
<td>5.01, 5.02, 5.08, 4.01(a), 4.01(b)</td>
<td>X</td>
<td></td>
<td>$499,448</td>
</tr>
<tr>
<td>2CT055</td>
<td>CTCs, Inc, 1441 Funston Avenue, Atlanta, GA 30315</td>
<td>Traffic Control</td>
<td>150</td>
<td>X</td>
<td></td>
<td>$34,500</td>
</tr>
<tr>
<td>2WI060</td>
<td>Wilkes Concrete Co Inc., 6832 Old Adel Rd, Moultrie GA 31788</td>
<td>Concrete - Flatwork</td>
<td>441</td>
<td>X</td>
<td></td>
<td>$165,508</td>
</tr>
<tr>
<td>2DK070</td>
<td>Kelly Rebar, 4015 Forest Drive Ste. 201, Columbia, SC 29204</td>
<td>Reinforcement Steel - F&amp;I</td>
<td>511</td>
<td>X</td>
<td></td>
<td>$1,332,348</td>
</tr>
<tr>
<td>2EN442</td>
<td>Enterprise Rebar LLC, 150 Prescott Road, Yemassee, SC 29945</td>
<td>SIP Deck - Install</td>
<td>500c</td>
<td>X</td>
<td></td>
<td>$143,760</td>
</tr>
<tr>
<td>14182</td>
<td>Superior Farm and Land Development, LLC, 310 Waco Drive, Suite 2, Sandersville, GA 31082</td>
<td>Hauling - Asphalt</td>
<td>400a</td>
<td>X</td>
<td></td>
<td>$200,000</td>
</tr>
<tr>
<td>15204</td>
<td>Mealing Ventures, LLC 2948 Rollingwood Drive, Augusta, GA 30906</td>
<td>Hauling - Agss / Dirt</td>
<td>206a</td>
<td>X</td>
<td></td>
<td>$1,068,271</td>
</tr>
<tr>
<td>2SH090</td>
<td>The Shon Company, PO Box 1366, Lexington, SC 29071</td>
<td>Guardrail</td>
<td>641</td>
<td>X</td>
<td></td>
<td>$430,469</td>
</tr>
<tr>
<td>13593</td>
<td>Gosalia Concrete Constructors, 4607 N. 56th Street, Tampa, FL 33610</td>
<td>Concrete - Traffic Railings</td>
<td>500</td>
<td>X</td>
<td></td>
<td>$1,952,462</td>
</tr>
<tr>
<td>2TM040</td>
<td>T.M.C. Grassing, Inc, 4670 Guthrie Cemetery Road, Suite 1, Loganville, GA 30052</td>
<td>Erosion/Grassing</td>
<td>163/700</td>
<td>X</td>
<td></td>
<td>$340,000</td>
</tr>
<tr>
<td>12131</td>
<td>CSI Geo, Inc., 2594 St. Johns Bluff Road South, Suite 200, Jacksonville, Fl 32246</td>
<td>Testing Laboratories, Other Professional, Scientific, and Technical Services</td>
<td>6.04(a), 6.04(b)</td>
<td>X</td>
<td>$684,356</td>
<td></td>
</tr>
<tr>
<td>14266</td>
<td>Road Runner Highway Signs, LLC, 5330 Counselor Lane, Knoxville, TN 37914</td>
<td>Highway Signs</td>
<td>636</td>
<td>X</td>
<td></td>
<td>$1,064,867</td>
</tr>
</tbody>
</table>

**TOTAL:** $7,916,004
EXHIBIT 15

RESERVED
EXHIBIT 16

RESERVED
EXHIBIT 17

BUILDER’S RISK INSURANCE

At all times during the period from the Construction Commencement Date until the Substantial Completion Date and during any other period in which other Construction Work is in progress, Design-Build Contractor shall procure and keep in force, or cause to be procured and kept in force, a policy of builder’s risk insurance as specified below.

(a) The policy shall provide minimum coverage of $40,000,000 per occurrence and $40,000,000 aggregate for “all risks” of direct physical loss or damage to the portions or elements of the Project under construction, including terrorism, the perils of earthquake, earth movement, flood, storm, tempest, windstorm, hurricane, and tornado and subsidence; shall contain extensions of coverage that are typical for a project of the nature of the Project; and shall contain only those exclusions that are typical for a project of the nature of the Project.

(b) The policy shall cover all property, roads, buildings, structures, fixtures, materials, supplies, foundations, pilings, machinery and equipment that are part of or related to the portions or elements of the Project under construction, and the works of improvement, including permanent and temporary works and materials, and including goods intended for incorporation into the works located at the Site, in storage or in the course of inland transit on land to the Site, and existing roadway, structures and improvements that are within the Construction Work zone or are or will be incorporated into the Construction Work.

(c) The policy shall provide coverage sublimits typical for a project of this size and type for professional fees, demolition and debris removal, without risk of co-insurance; provided, however, that the policy may include a sublimit for earth movement and flood of not less than $25,000,000 per occurrence and $25,000,000 aggregate. Lower coverage amounts may be proposed as an alternate if Design-Build Contractor provides a Probable Maximum Loss Study (a “PML Study”) prepared by a qualified third party experienced in performing such analysis which indicates that limits less than those called for above would be adequate to insure the Work.

(d) Design-Build Contractor, the State, GDOT, and Contractors of every tier shall be the named insureds on the policy as their respective interests appear. The policy shall be written so that no act or omission of any insured shall vitiate coverage of the other named insureds. GDOT will be named as co-Loss Payee under the policy with the Design-Build Contractor.

(e) The policy shall include coverage for (i) foundations, including pilings, but excluding normal settling, shrinkage, or expansion, (ii) physical damage resulting from machinery accidents but excluding normal and natural wear and tear, corrosion, erosion, inherent vice or latent defect in the machinery, (iii) plans, blueprints and specifications, (iv) demolition and debris removal coverage, (v) the increased replacement cost due to any change in applicable codes or other Laws, (vi) expense to reduce loss, (vii) building ordinance compliance, with the building ordinance exclusion deleted, and (viii) "soft cost expense" (including costs of Governmental Approvals, mitigation costs, attorneys’ fees, and other fees and costs associated with such damage or loss or replacement thereof).
(f) Subject to commercial market availability, and with a sublimit of $25,000,000 for the defective part or broken part itself, the policy shall be endorsed with LEG3 or DE5 language as provided below:

**LEG3 Endorsement:**

The Insurer(s) shall not be liable for:

All costs rendered necessary by defects of material workmanship design plan or specification and should damage occur to any portion of the Insured Property containing any of the said defects the cost of replacement or rectification which is hereby excluded is that cost incurred to improve the original material workmanship design plan or specification.

For the purpose of the policy and not merely this exclusion it is understood and agreed that any portion of the Insured Property shall not be regarded as damaged solely by virtue of the existence of any defect of material workmanship design plan or specification.

**Design Improvement Exclusion DE5 (1995):**

This policy excludes:

(a) The cost necessary to replace repair or rectify any Property Insured which is defective in design plan specification materials or workmanship.

(b) Loss or damage to the Property Insured caused to enable replacement repair or rectification of such defective Property Insured.

But should damage to the Property Insured which is free of such defective condition (other than damage as defined in (b) above) result from such a defect, this exclusion shall be limited to the costs of additional work resulting from and the additional costs of improvement to the original design plan specification materials or workmanship.

(g) The policy shall provide a deductible not exceeding $250,000 per occurrence or such higher deductible or DSU waiting period due to unavailability of the lower deductible called for.

(h) Such policy shall include the following minimum coverage sublimits:

i) $10,000,000 foundations, including pilings, but excluding normal settling, shrinkage, or expansion;

ii) $10,000,000 physical damage resulting from machinery accidents but excluding normal and natural wear and tear, corrosion, erosion, inherent vice or latent defect in the machinery;

iii) $250,000 plans, blueprints and specifications;

iv) $10,000,000 demolition and debris removal coverage;
v) $5,000,000 the increased replacement cost due to any change in applicable codes or other Laws;

vi) $5,000,000 expense to reduce loss;

vii) $10,000,000 building ordinance compliance, with the building ordinance exclusion deleted;

viii) “Soft cost expense” (including costs of Governmental Approvals, mitigation costs, attorneys’ fees, and other fees and costs associated with such delay resulting from damage or loss or replacement thereof) such soft cost limit must be disclosed to and approved by the Lenders and GDOT; and

ix) $10,000,000 damage to adjacent roadway and structures within the Project Site to be incorporated into the Construction Work which are damaged as a result of an insured loss.
MEASURES OF LIQUIDATED DAMAGES and NONREFUNDABLE DEDUCTIONS

1.1 For Late Interim Completion(s), Late Substantial Completion, and Late Final Acceptance

(a) Liquidated damages for late Interim Completion(s) shall equal $5,900 per day for each day that the Interim Completion Date(s) is later than the Interim Completion Deadline(s), as the Interim Completion Deadline(s) may be extended pursuant to this Agreement.

(b) Liquidated damages for late Substantial Completion for the Project shall equal $16,900 per day for each day that the Substantial Completion Date is later than the Substantial Completion Deadline, as the Substantial Completion Deadline may be extended pursuant to this Agreement.

(c) Liquidated damages for late Final Acceptance shall equal $8,500 per day for each day that the date of Final Acceptance is later than the Final Acceptance Deadline, as the Final Acceptance Date may be extended pursuant to this Agreement.

(d) Liquidated damages on account of any failure to achieve Final Acceptance by the Final Acceptance Date shall not be cumulative and in addition to Liquidated Damages under subpart (b) above where Substantial Completion is not achieved by the Substantial Completion Deadline, provided that where any such Liquidated Damages under subpart (b) cease to then accrue as a result of achieving Substantial Completion, and the Final Acceptance Date, as may thereafter be revised is not met, subpart (c) shall then apply.

1.2 Incident Based Liquidated Damages

Liquidated Damages upon the occurrence of the following, which shall not be cumulative, for any single occurrence. Where there are multiple incidents as set forth below contributing to a single occurrence, the highest applicable incident based Liquidated Damages relative to such occurrence shall apply.

1 Complete closure of I-20 Eastbound or I-20 Westbound as specified in Section 18 of Volume 2 $10,000 per hour*

2 Failure to reopen lanes as specified in Section 18 of Volume 2 $5,000 per hour*

3 Failure to maintain 4 lanes of travel (2 in each direction) on I-20 during the Work as specified in Section 18 of Volume 2 $5,000 per hour*

4 Failure to reopen ramps as specified in Section 18 of Volume 2 $5,000 per hour*

5 Failure to reopen shoulders as specified in Section 18 of Volume 2 $5,000 per hour*

6 Failure to reopen access to the South Carolina and/or Georgia Welcome Centers after closure incident has $5,000 per hour*
occurred in accordance with Section 1.3 of this Exhibit 18

7 Failure to adhere to Holiday traffic restrictions and District 2 Masters shutdown traffic restrictions as required by Section 18 of Volume 2 $2,500 per hour*

8 Failure to maintain flowrate restrictions of the Augusta Canal as required by Section 4 of Volume 2 $5,000 per hour*

9 Failure to reopen sufficient access within the Augusta Canal as required by Section 4 of Volume 2 prior to exceeding the closure commitment duration shown in Exhibit 9 or following any closure not identified in Exhibit 9 and the Project Schedule $2,500 per hour*

10 Failure to reopen pedestrian access following a closure to the towpath on the Augusta Canal as required by Section 4 of Volume 2 prior to exceeding either towpath #1 or towpath #2 closure duration commitments shown in Exhibit 9 or following any closure not identified in Exhibit 9 and the Project Schedule $2,500 per hour*

11 Exceeding the maximum number of hours for EB lane closure duration as shown in Exhibit 9 $5,000 per hour

12 Exceeding the maximum number of hours for WB lane closure duration as shown in Exhibit 9 $5,000 per hour

*In addition to liquidated damages, DB Te am shall be liable for any fines assessed against GDOT.

1.3 Incident Based Nonrefundable Deductions

Nonrefundable Deductions upon the occurrence of the following, which shall not be cumulative, for any single occurrence. Where there are multiple incidents as set forth below contributing to a single occurrence, the highest applicable incident based liquidated damages relative to such occurrence shall apply.

1 Replacement of an individual in a Key Personnel position after submission of the Proposal for any reason, except as allowed under Article 10.4.1 of the Agreement $5,000 per occurrence

2 Failure to comply with any of its responsibilities per the requirements of Section 2 of the Technical Provisions including Project Management, Quality Management, Schedule, etc. $5,000 per occurrence
<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Failure to follow Comprehensive Environmental Protection Program procedures as required by Section 4 of the Technical Provisions</td>
<td>$7,200 per occurrence*</td>
</tr>
<tr>
<td>4</td>
<td>Causing environmental damage in contravention of Section 4 of the Technical Provisions and the latest approved Environmental Documents</td>
<td>$23,000 per occurrence*</td>
</tr>
<tr>
<td>5</td>
<td>A failure to follow the approved procedures outlined in the Utility Emergency Procedures Plan as required in Section 6 of Technical Provisions</td>
<td>$8,000 per occurrence*</td>
</tr>
<tr>
<td>6</td>
<td>Failure to maintain sufficient access / clearance within the Augusta Canal in accordance with Section 4 and Attachment 4-1 of Volume 2</td>
<td>$11,000 per occurrence*</td>
</tr>
<tr>
<td>7</td>
<td>Failure to maintain pedestrian access to the towpath on the Augusta Canal in accordance with Section 4 and Attachment 4-1 of Volume 2</td>
<td>$11,000 per occurrence*</td>
</tr>
<tr>
<td>8</td>
<td>Failure to maintain existing access to the South Carolina and/or Georgia Welcome Centers as required by Section 18 of Volume 2</td>
<td>$11,000 per occurrence*</td>
</tr>
<tr>
<td>9</td>
<td>Complete drainage of the Augusta Canal as required by Attachment 4-1 of Volume 2</td>
<td>$20,000 per occurrence*</td>
</tr>
<tr>
<td>10</td>
<td>Damage caused by the DB Team to GDOT ITS device (camera, radar, VSLS, etc.) or enclosure. Or damage caused or loss of use to an existing ITS device.</td>
<td>$2,500 per occurrence**</td>
</tr>
<tr>
<td>11</td>
<td>Failure to bring the GDOT ITS system (fiber optic trunk, electrical power, ITS device (camera, radar, VSLS, etc.) back on line within 24 hours after damage or failure caused by the DB Team</td>
<td>$13,700 per occurrence**</td>
</tr>
<tr>
<td>12</td>
<td>Failure to establish and maintain traffic in accordance with an approved Transportation Management Plan in accordance with Design-Build Team’s Work, including in Related Transportation Facilities and GP traffic lanes as required by Section 18.2 and Section 18.3 of the Technical Provisions.</td>
<td>$7,000 per occurrence</td>
</tr>
<tr>
<td>13</td>
<td>Failure to adhere to traffic restrictions as required by Section 18 of the Technical Provisions</td>
<td>$13,300 per occurrence*</td>
</tr>
<tr>
<td>14</td>
<td>Failure to adhere to District 2 Masters Golf Tournament shutdown traffic restrictions as required by Section 18 of Volume 2</td>
<td>$30,000 per occurrence*</td>
</tr>
</tbody>
</table>
*In addition to Nonrefundable Deductions, the DB Team shall be liable for any fines assessed against GDOT.

**In addition to Nonrefundable Deductions, the DB Team shall be liable for all costs of repairs of ITS equipment. ITS repairs will be done in accordance with Section 17.4.1.4 of Volume 2.
EXHIBIT 19

GEORGIA SECURITY AND IMMIGRATION COMPLIANCE ACT AFFIDAVIT
FORM R

GEORGIA SECURITY AND IMMIGRATION COMPLIANCE ACT AFFIDAVIT

Contract No. and Name: Design-Build Agreement for the I-20 at Savannah River Bridge Replacements and Roadway Widening Project (the "Project")

Name of Contracting Entity: Superior Construction Company Southeast, LLC

By executing this affidavit, the undersigned person or entity verifies its compliance with O.C.G.A. § 13-10-91, stating affirmatively that the individual, firm, or corporation which is contracting with the Georgia Department of Transportation has registered with, is authorized to participate in, and is participating in the federal work authorization program commonly known as E-Verify, in accordance with the applicable provisions and deadlines established in O.C.G.A. § 13-10-91.

The undersigned person or entity further agrees that it will continue to use the federal work authorization program throughout the contract period, and it will contract for the physical performance of services in satisfaction of such contract only with subcontractors who present an affidavit to the undersigned with the information required by O.C.G.A. § 13-10-91(b).

The undersigned person or entity further agrees to maintain records of such compliance and provide a copy of each such verification to the Georgia Department of Transportation at the time the subcontractor(s) is retained to perform such service.

245523
EEV/E-Verify™ User Identification Number

BY: Authorized Officer or Agent
(Name of Person or Entity)

President
Title of Authorized Officer or Agent
Agent

SUBSCRIBED AND SWORN BEFORE ME
ON THIS THE 21st DAY OF September, 2018

Notary Public
My Commission Expires: [Notary Seal]

09/03/09
Date of Authorization

09/21/18
Date

Pete Kelley
Printed Name of Authorized Officer or Agent

1 or any subsequent replacement operated by the United States Department of Homeland Security or any equivalent federal work authorization program operated by the United States Department of Homeland Security to verify information of newly hired employees, pursuant to the Immigration Reform and Control Act of 1986 (IRCA), P.L. 99-603.
List of states that verify immigration status prior to issuance of a driver's license or I.D. card and only issue to persons lawfully present in the United States, as required by O.C.G.A Section 13-10-91(b)(5).

<table>
<thead>
<tr>
<th>Compliant</th>
<th>Kentucky*</th>
<th>North Dakota*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alabama</td>
<td>Louisiana**</td>
<td>Ohio</td>
</tr>
<tr>
<td>Alaska*</td>
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US Territories Guam, Puerto Rico and the U.S. Virgin Islands also have an extension through October 10, 2018.

US Territories American Samoa and Northern Mariana Islands are currently under review.

*Indicates an extension allowing Federal agencies to accept their driver's licenses through October 10, 2018.

**DHS is currently reviewing extension requests from these states with extensions that expired on October 10th, 2017. States will have a grace period until January 22, 2018, meaning that Federal agencies (including TSA) will continue to accept driver's license and identification cards issued by these states in accordance with each agency's policies.
EXHIBIT 20

TERMS FOR TERMINATION COMPENSATION

A. Compensation on Termination for Convenience, for GDOT Default, or for GDOT Suspension of Work

1. In the event of termination of the Agreement under Article 19.1 (Termination for Convenience) or Article 19.4 (Termination for GDOT Default or Suspension of Work), the Termination Compensation shall equal:

   (i) That portion of the DB Contract Sum on account of (a) Work performed that has not already been paid; plus

   (ii) The amount necessary to reimburse reasonable and documented out-of-pocket costs of third party and Affiliate Contractors to demobilize and terminate under Contracts between Design-Build Team and third parties or Affiliates for performance of Work, excluding Design-Build Team's non-contractual liabilities and indemnity liabilities (contractual or non-contractual) to third parties or Affiliates; plus

   (iii) If termination occurs prior to Substantial Completion, Design-Build Team's own reasonable and documented out-of-pocket costs to demobilize (without duplication) and carry out termination obligations as may be directed by GDOT or required pursuant to the Agreement; minus

   (iv) The sum of (i) the greater of (A) the proceeds received from insurance (including casualty insurance and business interruption insurance) that is required to be carried pursuant to Article 16.1 of the Agreement and provides coverage to pay, reimburse or provide for any of the costs and losses attributable to any Force Majeure Event, and (B) the proceeds received from insurance that is actually carried by or insuring Design-Build Team under policies solely with respect to the Project and the Work, regardless of whether required to be carried pursuant to Article 16.1 of the Agreement, and that provides coverage to pay, reimburse or provide for any of the costs and losses attributable to any Force Majeure Event (exclusive of payments on account of replacement Work performed and to be reimbursed under the builder's risk insurance coverage), plus (ii) the foregoing costs and losses that Design-Build Team is deemed to have self-insured pursuant to Article 16.3.3 of the Agreement; minus

   (v) The portion of any Compensation Amounts previously paid to (or charged against) Design-Build Team that compensated Design-Build Team for Work attributable to the period after the Early Termination Date.

2. In the event of termination of the Agreement under Article 19.1 (Termination for Convenience) or Article 19.4 (Termination for GDOT Default or Suspension of Work), any such Termination Compensation shall be payable by GDOT as follows:

   (i) For Termination for Convenience

      (a) Termination for Convenience shall be valid and effective on the date set forth in the Notice of Termination for Convenience, which date shall not be more than three (3) months after the date the notice is delivered.
(b) GDOT shall deliver to Design-Build Team, in immediately available funds, within sixty (60) days after the Early Termination Date, the Termination Compensation due, less a holdback amount equal to GDOT’s reasonable estimate of the costs Design-Build Team will thereafter incur to perform and complete its post-termination obligations under Article 19.5 of the Agreement, subject to Sections (ii)(b) - (d) below.

(ii) For Termination for GDOT Default or Suspension of Work

(a) If the Agreement is terminated due to Design-Build Team’s exercise of its right to terminate under Article 19.4 of the Agreement, termination shall be valid and effective on the date notice of termination is delivered; and, subject to Articles 19.3.2 and 19.4.4, GDOT shall deliver to Design-Build Team, in immediately available funds, within sixty (60) days after the Early Termination Date, the Termination Compensation due, less a holdback amount equal to GDOT’s reasonable estimate of the costs Design-Build Team will thereafter incur to perform and complete its post-termination obligations under Article 19.5 of the Agreement. In the event that the Termination Compensation is negative, then the Design-Build Team shall deliver the Compensation Payment due to GDOT within sixty (60) days after the Early Termination Date.

(b) GDOT shall pay the holdback amount to Design-Build Team within ten (10) days after Design-Build Team completes all its post-termination obligations under Article 19.5 of the Agreement.

(c) If as of the date GDOT tenders payment under clause (a) above the Parties have not agreed upon the amount of Termination Compensation due, then:

(i) GDOT shall proceed with such payment to Design-Build Team;

(ii) Within thirty (30) days after receiving such payment Design-Build Team shall deliver to GDOT written notice of the additional amount of Termination Compensation that Design-Build Team in good faith determines is still owing (the “disputed portion”);

(iii) GDOT shall pay the disputed portion of the Termination Compensation to Design-Build Team in immediately available funds within thirty (30) days after the disputed portion is determined by settlement, final order or final judgment, and also shall pay interest thereon, at the Default Interest Rate from the Early Termination Date until paid; and

(iv) A failure by GDOT to effect payment by such date shall not entitle Design-Build Team to reinstatement of the Design-Build Team’s Interest or to rescission of the termination.

(d) From and after the Early Termination Date until the Termination Compensation is finally determined and paid, the provisions of Article 19.10 of the Agreement shall apply.

(e) If it is determined by settlement or final judgment that the Termination Compensation due from GDOT is less than the payment previously made by GDOT, then within thirty (30) days after the date of settlement or final judgment Design-
Build Team shall reimburse the excess payment, together with interest thereon at the Default Interest Rate from the date of overpayment until the date of reimbursement.

(f) Any amounts to be paid by GDOT pursuant hereto shall be subject to Default Interest Rate from the date that such payment shall be due until paid.

### B. Compensation on Termination for Design-Build Team Default

1. Design-Build Team shall not be entitled to receive any compensation where the Agreement is terminated by GDOT pursuant to Article 19.3 as a result of a Design-Build Team Default if it has been determined by GDOT that the damages incurred by GDOT and costs to complete the Work as a result of the Design-Build Team Default exceed the unpaid balance of the DB Contract Sum. In no event shall Design-Build Team be entitled to any direct costs, including demobilization, associated with a termination by GDOT pursuant to Article 19.3. In the event that the Termination Compensation is negative, then the Design-Build Team shall deliver the Compensation Payment due to GDOT within sixty (60) days after the Early Termination Date.

### C. Claims

1. Notwithstanding anything to the contrary herein, Termination Compensation shall include and be adjusted on account of any outstanding Compensation Event that is independent of the event of termination and which is not otherwise resolved as of the effective date of such termination. The Parties shall adjust the Termination Compensation by the amount of the unpaid award, if any, on the Compensation Event.

2. At GDOT’s sole election, it may hold back from payment of the Termination Compensation for deposit into the GDOT Claims Account the amount of any claim of GDOT against Design-Build Team not resolved prior to payment. GDOT shall provide written notice to Design-Build Team of any such election, the subject claim and the amount deposited or to be deposited, prior to or concurrently with tendering payment of the Termination Compensation.

3. If as of the date GDOT tenders payment under clause (a) above the Parties have not agreed upon the amount of Termination Compensation due, then:

   (i) GDOT shall proceed with such payment to Design-Build Team;

   (ii) Within thirty (30) days after receiving such payment Design-Build Team shall deliver to GDOT written notice of the additional amount of Termination Compensation that Design-Build Team in good faith determines is still owing (the “disputed portion”);

   (iii) GDOT shall pay the disputed portion of the Termination Compensation to Design-Build Team in immediately available funds within thirty (30) days after the disputed portion is determined by settlement, final order or final judgment, together with interest thereon at the Default Interest Rate from the later of the two dates set forth in clause (a) above until paid; and

   (iv) Failure by GDOT to effect payment by such date shall not entitle Design-Build Team to reinstatement of the Design-Build Team’s Interest or to rescission of the termination.

4. If it is determined by settlement or final judgment that the Termination Compensation due from GDOT is less than the payment previously made by GDOT, then within
thirty (30) days after the date of settlement or final judgment Design-Build Team shall reimburse the excess payment, together with interest thereon at the Default Interest Rate from the date of overpayment until the date of reimbursement.
EXHIBIT 21

Non-Collusion Affidavit
FORM B

Non-Collusion Affidavit*

STATE OF Florida )

COUNTY OF Duval )SS:

Each of the undersigned, being first duly sworn, deposes and says that:

A. Pete Kelley [name] is the President [title] of Southeast, LLC [firm] and N/A [name] is the N/A [title] of N/A [firm], which entity(ies) are the N/A [relationship to Proposer] of N/A, the entity making the foregoing Proposal.

B. The Proposal is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization, joint venture, limited liability company or corporation; the Proposal is genuine and not collusive or a sham; the Proposal has not directly or indirectly induced or solicited any other Proposer to put in a false or sham Proposal, and has not directly or indirectly colluded, conspired, connived or agreed with any Proposer or anyone else to put in a sham Proposal or refrained from proposing; the Proposer has not in any manner, directly or indirectly, sought by agreement, communication or conference with anyone to fix the prices of the Proposer or any other Proposer, or to fix any overhead, profit or cost element included in the Proposal, or of that of any other Proposer, or to secure any advantage against GDOT or anyone interested in the proposed DBA; all statements contained in the Proposal are true; and, further, the Proposer has not, directly or indirectly, submitted its prices or any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, or paid, and will not pay, any fee to any corporation, partnership, company, association, joint venture, limited liability company, organization, Proposal depository or any member, partner, joint venture member or agent thereof to effectuate a collusive or sham Proposal.

C. The Proposer will not, directly or indirectly, divulge information or data regarding the price or other terms of its Proposal to any other Proposer, or seek to obtain information or data regarding the price or other terms of any other Proposal, until after award of the DBA or rejection of all Proposals and cancellation of the Request for Proposals.

* Initially capitalized terms not otherwise defined herein shall have the meanings ascribed thereto pursuant to the Instructions to Proposers within the Request for Proposals for the Project.

[signature page follows]
Georgia Department of Transportation

P.I. No. 210327-1-20 at Savannah River Design-Build Project

Instructions to Proposers

Amendment 2 Issued: August 31, 2018

(Signature)  (Signature)

Pete Kelley  (Name Printed)  (Name Printed)

President  (Title)  (Title)

(Signature)  (Signature)

(Name Printed)  (Name Printed)

(Title)  (Title)

(Signature)  (Signature)

(Name Printed)  (Name Printed)

(Title)  (Title)

Subscribed and sworn to before me this 21 day of Sept., 2018.

Notary Public in and for said County and State

[Seal]

My commission expires: 

[Proposers shall duplicate or modify this form as necessary so that it accurately describes the entity making the Proposal and so that it is signed on behalf of all partners, members, joint venture members, Participating Members and Major Non-Participating Members.]
FORM B

Non-Collusion Affidavit*

STATE OF Georgia
COUNTY OF DeKalb

Each of the undersigned, being first duly sworn, deposes and says that:

A. Claudia Bilotto [name] is the Area Manager [title] of WSP USA Inc. [firm] and __________ [name] is the __________ [title] of __________ [firm], which entity(ies) are the Lead Design Consultant [relationship to Proposer] of __________, the entity making the foregoing Proposal. Superior Construction Company Southeast, LLC

B. The Proposal is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization, joint venture, limited liability company or corporation; the Proposal is genuine and not collusive or a sham; the Proposer has not directly or indirectly induced or solicited any other Proposer to put in a false or sham Proposal, and has not directly or indirectly colluded, conspired, connived or agreed with any Proposer or anyone else to put in a sham Proposal or refrained from proposing; the Proposer has not in any manner, directly or indirectly, sought by agreement, communication or conference with anyone to fix the prices of the Proposer or any other Proposer, or to fix any overhead, profit or cost element included in the Proposal, or of that of any other Proposer, or to secure any advantage against GDOT or anyone interested in the proposed DBA; all statements contained in the Proposal are true; and, further, the Proposer has not, directly or indirectly, submitted its prices or any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, or paid, and will not pay, any fee to any corporation, partnership, company, association, joint venture, limited liability company, organization, Proposal depository or any member, partner, joint venture member or agent thereof to effectuate a collusive or sham Proposal.

C. The Proposer will not, directly or indirectly, divulge information or data regarding the price or other terms of its Proposal to any other Proposer, or seek to obtain information or data regarding the price or other terms of any other Proposal, until after award of the DBA or rejection of all Proposals and cancellation of the Request for Proposals.

* Initially capitalized terms not otherwise defined herein shall have the meanings ascribed thereto pursuant to the instructions to Proposers within the Request for Proposals for the Project.

[signature page follows]
Georgia Department of Transportation
P.I. No. 210327 - I-20 at Savannah River Design-Build Project

Claudia Bilotto, AICP
Vice President/Area Manager

(Signature)
(Name Printed)
(Title)

(Signature)
(Name Printed)
(Title)

(Signature)
{Name Printed}
(Title)

(Signature)
{Name Printed}
(Title)

Subscribed and sworn to before me this 20th day of Sept., 2018.

CLARIBEL BARNES
Notary Public - State of Georgia
DeKalb County
My Commission Expires Oct 12, 2021

[Seal]
My commission expires: October 12, 2021

[Proposers shall duplicate or modify this form as necessary so that it accurately describes the entity making the Proposal and so that it is signed on behalf of all partners, members, joint venture members, Participating Members and Major Non-Participating Members.]
FORM B

Non-Collusion Affidavit*

STATE OF North Carolina )
COUNTY OF Mecklenburg SS:

Each of the undersigned, being first duly sworn, deposes and says that:

AE. Richard Capps, Jr. PE [name] is the Sr Vice President [title] of STV Incorporated [firm] and South Carolina EOR [relationship to Proposer] of Superior Construction Company Southeast, LLC, the entity making the foregoing Proposal. [name] is the __________ [title] of __________ [firm], which entity(ies) are the

B. The Proposal is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization, joint venture, limited liability company or corporation; the Proposal is genuine and not collusive or a sham; the Proposer has not directly or indirectly induced or solicited any other Proposer to put in a false or sham Proposal, and has not directly or indirectly colluded, conspired, connived or agreed with any Proposer or anyone else to put in a sham Proposal or refrained from proposing; the Proposer has not in any manner, directly or indirectly, sought by agreement, communication or conference with anyone to fix the prices of the Proposer or any other Proposer, or to fix any overhead, profit or cost element included in the Proposal, or of that of any other Proposer, or to secure any advantage against GDOT or anyone interested in the proposed DBA; all statements contained in the Proposal are true; and, further, the Proposer has not, directly or indirectly, submitted its prices or any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, or paid, and will not pay, any fee to any corporation, partnership, company, association, joint venture, limited liability company, organization, Proposal depository or any member, partner, joint venture member or agent thereof to effectuate a collusive or sham Proposal.

C. The Proposer will not, directly or indirectly, divulge information or data regarding the price or other terms of its Proposal to any other Proposer, or seek to obtain information or data regarding the price or other terms of any other Proposal, until after award of the DBA or rejection of all Proposals and cancellation of the Request for Proposals.

* Initially capitalized terms not otherwise defined herein shall have the meanings ascribed thereto pursuant to the Instructions to Proposers within the Request for Proposals for the Project.

[signature page follows]
Subscribed and sworn to before me this 26th day of September 2018.

[Properers should duplicate or modify this form as necessary so that it accurately describes the entity making the Proposal and so that it is signed on behalf of all partners, members, joint venture members, Participating Members and Major Non-Participating Members.]
EXHIBIT 22

INITIAL DESIGNATION OF AUTHORIZED REPRESENTATIVES

GDOT’s Authorized Representative:

GDOT hereby designates the persons from time to time serving as the Executive Director of GDOT as its Authorized Representatives and such other persons as the Executive Director may from time to time designate by delivering written notice thereof to Design-Build Team. Any such designations by the Executive Director may be limited in scope and duration and may be revoked at any time by delivery of written notice thereof to Design-Build Team pursuant to Article 24.11 of the Agreement.

GDOT’s Authorized Representative:

GDOT hereby designates the persons from time to time serving as the Commissioner of GDOT as its Authorized Representatives and such other persons as the Commissioner may from time to time designate by delivering written notice thereof to Design-Build Team. Any such designations by the Commissioner may be limited in scope and duration and may be revoked at any time by delivery of written notice thereof to Design-Build Team pursuant to Article 24.11 of the Agreement.

Design-Build Team’s Authorized Representative:

Design-Build Team hereby designates the persons from time to time serving as the Chief Executive Officer of Design-Build Team as its Authorized Representatives and such other persons as the Chief Executive Officer may from time to time designate by delivering written notice thereof to GDOT. Any such designations by the Chief Executive Officer may be limited in scope and duration and may be revoked at any time by delivery of written notice thereof to GDOT pursuant to Article 24.11 of the Agreement.
EXHIBIT 23

Drug Free Workplace
FORM T

Drug Free Workplace

STATE OF Florida )
COUNTY OF Duval ) SS:

Each of the undersigned, being first duly sworn, deposes and says that:

Pete Kelley is the President of Superior Construction Company Southeast, LLC, the entity making the foregoing Proposal.

The undersigned certifies that the provisions of Code Sections 50-24-1 through 50-24-6 of the Official Code of Georgia Annotated, relating to the "Drug-free Workplace Act", have been complied with in full.

The undersigned further certifies that:

(1) A drug-free workplace will be provided for the Contractor's employees during the performance of the Contract; and

(2) Each Contractor who hires a Subcontractor to work in a drug-free workplace shall secure from that Subcontractor the following written certification:

"As part of the subcontracting agreement with (Contractor's name) (Subcontractor's name) certifies to the Contractor that a drug free workplace will be provided for the Subcontractor's employees during the performance of this Contract pursuant to paragraph (7) of subsection (b) of Code Section 50-24-3."

Also, the undersigned further certifies that he will not engage in the unlawful manufacture, sale distribution, dispensation, possession, or use of a controlled substance or marijuana during the performance of the Contract.

[signature page follows]
[Proposers shall duplicate or modify this form as necessary so that it accurately describes the entity making the Proposal and so that it is signed on behalf of all partners, members, joint venture members, Participating Members and Major Non-Participating Members.]
FORM T

Drug Free Workplace

STATE OF Georgia )
COUNTY OF Dekalb )SS:

Each of the undersigned, being first duly sworn, deposes and says that:

Claudia Bilotto is the Area Manager of WSP USA Inc. and ______ is the ______ of ______, which entity(ies) are the Lead Design of ______, the entity making the foregoing Proposal. Superior Construction Company Southeast, LLC

The undersigned certifies that the provisions of Code Sections 50-24-1 through 50-24-6 of the Official Code of Georgia Annotated, relating to the "Drug-free Workplace Act", have been complied with in full.

The undersigned further certifies that:

(1) A drug-free workplace will be provided for the Contractor's employees during the performance of the Contract; and

(2) Each Contractor who hires a Subcontractor to work in a drug-free workplace shall secure from that Subcontractor the following written certification:

"As part of the subcontracting agreement with (Contractor's name)__________ (Subcontractor's name)__________, certifies to the Contractor that a drug free workplace will be provided for the Subcontractor's employees during the performance of this Contract pursuant to paragraph (7) of subsection (b) of Code Section 50-24-3."

Also, the undersigned further certifies that he will not engage in the unlawful manufacture, sale distribution, dispensation, possession, or use of a controlled substance or marijuana during the performance of the Contract.

[signature page follows]
Claudia Bilotto, AICP
Vice President/Area Manager
(Signature)  (Name Printed)  (Title)

Subscribed and sworn to before me this 20th day of Sept., 2018.

CLARIBEL BARNES
Notary Public in and for said County and State
Notary Public – State of Georgia
My Commission Expires Oct 12, 2021

[Seal]
My commission expires: October 12, 2021

[Proposers shall duplicate or modify this form as necessary so that it accurately describes the entity making the Proposal and so that it is signed on behalf of all partners, members, joint venture members, Participating Members and Major Non-Participating Members.]
FORM T

Drug Free Workplace

STATE OF North Carolina )
COUNTY OF Mecklenburg )SS:

Each of the undersigned, being first duly sworn, deposes and says that:

E. Richard Capps, Jr. PE is the Sr. Vice President of STV Incorporated and __________ is the ______ of South Carolina EOR of ________, the entity making the foregoing Proposal.

Superior Construction Company Southeast, LLC

The undersigned certifies that the provisions of Code Sections 50-24-1 through 50-24-6 of the Official Code of Georgia Annotated, relating to the "Drug-free Workplace Act", have been complied with in full.

The undersigned further certifies that:

(1) A drug-free workplace will be provided for the Contractor’s employees during the performance of the Contract; and

(2) Each Contractor who hires a Subcontractor to work in a drug-free workplace shall secure from that Subcontractor the following written certification:

"As part of the subcontracting agreement with (Contractor’s name) __________ (Subcontractor’s name) __________ certifies to the Contractor that a drug free workplace will be provided for the Subcontractor’s employees during the performance of this Contract pursuant to paragraph (7) of subsection (b) of Code Section 50-24-3."

Also, the undersigned further certifies that he will not engage in the unlawful manufacture, sale distribution, dispensation, possession, or use of a controlled substance or marijuana during the performance of the Contract.

[signature page follows]
Georgia Department of Transportation

E. J. Capps, Jr., PE
Senior Vice President

(Signature)
(Name Printed)
(Title)

Subscribed and sworn to before me this 20th day of Sept., 2019.

[Seal]

CHRIStIAN A. LYNCH
Notary Public in and for said County and State

My commission expires: November 15, 2022.

[Proposer shall duplicate or modify this form as necessary so that it accurately describes the entity making the Proposal and so that it is signed on behalf of all partners, members, joint venture members, Participating Members and Major Non-Participating Members.]
EXHIBIT 24

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

SPECIAL PROVISION

ESCROW BID DOCUMENTATION

Scope and Purpose

The purpose of this specification is to preserve the bid documents of the successful proposer (DB Team) for use by the parties in any claims or litigation between GDOT and DB Team arising out of this Design-Build Agreement (the "DB Agreement").

The DB Team shall submit a legible copy of bid documentation used to prepare the bid for this DB Agreement to GDOT or their authorized representative at the Department, the Administrator of the Office of Bidding Administration. Such documentation shall be placed in escrow with a banking institution or other bonded document storage facility and preserved by that institution/facility as specified in the following sections of this specification.

Bid Documentation

The term "bid documentation" as used in this specification means all writings, working papers, computer printouts, charts, and all other data compilations which contain or reflect information, data, and calculations used by the DB Team to determine the bid in bidding for this project. The term "bid documentation" includes, but is not limited to, DB Team equipment rates, DB Team overhead rates, labor rates, efficiency or productivity factors, arithmetic extensions, and quotations from consultants, subconsultants, subcontractors, and material suppliers to the extent that such rates and quotations were used by the DB Team in formulating and determining the amount of the bid. The term "bid documentation" also includes any manuals which are standard to the industry used by the DB Team in determining the bid for this project. Such manuals may be included in the bid documentation by reference. Such reference shall include the name and date of the Publication and the Publisher. The term does not include bid documents provided by the Department for use by the DB Team in bidding on this project.

Submittal of Bid Documentation

The DB Team shall submit the bid documentation to GDOT or their authorized representative at the Department in a container suitable for sealing, no later than ten calendar days following award announcement of the DB Agreement by GDOT. A Notice to Proceed will not be issued until the acceptable documentation has been received. The container shall be clearly marked "Bid Documentation" and shall also show on the face of the container the DB Team's name, the date of submittal, the Project Number, the P.I. Number, the Contract Number, and the County(ies).

Affidavit

In addition to the bid documentation, an affidavit, signed under oath by an individual authorized by the DB Team to execute bidding proposals shall be included, as set forth in Attachment 1. The affidavit shall list each bid document with sufficient specificity so a comparison may be made between the list and the bid documentation to ensure that all of the bid documentation listed in the affidavit has been enclosed. The affidavit shall attest that the affiant has personally examined the bid documentation, that the affidavit lists all of the documents used by the DB Team to determine the bid for this project, and that all such bid documentation has been included.
Verification

Upon receipt of the bid documentation GDOT or their authorized representatives at the Department and the DB Team will verify the accuracy and completeness of the bid documentation compared to the affidavit. Should a discrepancy exist the DB Team shall immediately furnish GDOT or their authorized representative at the Department with any other needed total documentation. GDOT or their authorized representative at the Department, upon determining that the bid documentation is complete, will, in the presence of the DB Team’s representative, immediately place the complete documentation and affidavit in the container and seal it. Both parties will deliver the sealed container to a banking institution or other bonded document storage facility selected by GDOT or their authorized representative at the Department for placement in a safety deposit box, vault or other secure accommodation.

Duration and Use

The bid documentation and affidavit shall remain in escrow during the life of the DB Agreement or until such time as the DB Team notifies GDOT of its intention to file a claim or its initiation of litigation against GDOT related to the Contract. Notification of the DB Team’s intention to file a claim or litigation against GDOT shall be sufficient evidence for GDOT or their authorized representative to obtain the release and custody of the bid documentation. If no such notification is received and the DB Team has signed the final Standard Release Form, GDOT shall instruct the banking institution or other bonded document storage facility to release the sealed container to the DB Team, as set forth in Attachment 2.

The DB Team agrees that the sealed container placed in escrow contains all of the bid documentation used to determine the bid and that no other bid documentation shall be utilized by the DB Team in litigation over claims brought by the DB Team arising out of this contract.

Refusal or Failure to Provide Bid Documentation

Failure or refusal to provide bid documentation shall be deemed either:

1. Failure to execute the DB Agreement if the DB Agreement has not yet been executed or,
2. Material breach of the DB Agreement if the DB Agreement has been executed.

Should the DB Team fail to execute the DB Agreement as stated in 1 above, GDOT will retain the bid bond. Refusal of the DB Team to provide adequate documentation after execution of the DB Agreement will be considered material breach of the DB Agreement and the DB Team will be declared in default of the Contract. GDOT may, at its option terminate the DB Agreement for default. These remedies are not exclusive and GDOT may take such other action as is available to it under the law.

Confidentiality of Bid Documentation

The bid documentation and affidavit in escrow are, and will remain, the property of the DB Team. GDOT has no interest in, or right to, the bid documentation and affidavit other than to verify the contents and legibility of the bid documentation unless notification of the intention to file claim is received or litigation ensues between GDOT and DB Team. In the event of such notification or litigation, the bid documentation and affidavit shall become the property of GDOT.

Cost and Escrow Instructions

The cost of the escrow will be borne by the Department. GDOT or their authorized representative at the Department will provide escrow instructions to the banking institution or other bonded document storage facility consistent with this specification.
Escrow Agreement

A copy of the Escrow Agreement the successful bidder will be required to sign is provided as set forth in Attachment 3. The successful bidder (DB Team) agrees that they will sign the Escrow Agreement. Should the DB Team fail to sign the Escrow Agreement, when presented, GDOT will retain the bid bond. If the DB Agreement has been executed, and the DB Team fails to sign the Escrow Agreement, the DB Team may be declared in default of the Contract.

Payment

There will be no separate payment for compilation of the data, container or cost of verification of the bid documentation. All costs shall be included in the overall DB Agreement bid price.
EXHIBIT 24

Attachment 1

AFFIDAVIT

STATE OF
GEORGIA COUNTY
OF FULTON

COMES NOW (Name) ____________, (Title) ________ of Superior Construction Company Southeast, LLC______ who, after having been duly sworn, on oath, state and depose as follows:

1.

This Affidavit is based upon the personal knowledge of the Affiant.

2.

Superior Construction Company Southeast, LLC submitted a bid on Georgia Department of Transportation Project No. 210327-, Richmond COUNTY(IES) which bid was the best value bid, and a DB Agreement has been entered into between Superior Construction Company Southeast, LLC and the Georgia Department of Transportation, known as DB Agreement No. ________________________.

3.

This Affidavit is given in compliance with the special provision entitled “ESCROW BID DOCUMENTATION” forming part of the DB Agreement Documents of DB Agreement No. ________________________.

4.

The Affiant attests that, in his capacity for Superior Construction Company Southeast, LLC, he is personally aware the “Bid Documentation” which was used by the Company in determining, formulating, and submitting the bid on Project No. 210327-, Richmond COUNTY(IES).

5.

The Affiant further states that he has examined the bid documentation which has been placed in a sealed container marked “Bid Documentation”, and that all such Bid Documentation utilized by the Company in determining, formulating, and submitting its bid is contained in the sealed container so marked.

6.

Each bid document contained in the sealed container is separately listed on Exhibit A, which is attached hereto and incorporated herein as fully as if included in this Affidavit at this paragraph 6.
Further Affiant sayeth not.

Superior Construction Company Southeast, LLC

By: ________________________________
    (Signature)

__________________________________
    (Print Name)

Its: ________________________________
    (Title)

Sworn to and subscribed before me this ______ day of _______________________, 20____.

__________________________________
    NOTARY PUBLIC

My Commission expires: _________________________
EXHIBIT 24

Exhibit A to Attachment 1
EXHIBIT 24
Attachment 2

ESCROW RELEASE OF BID DOCUMENTS

This is to certify that on this __________ day of ______, 20__, the sealed container identified as:

“Bid Documentation”

DB TEAM: Superior Construction Company Southeast, LLC
PROJECT NUMBER: N/A
P.I. NUMBER: 210327-
CONTRACT NUMBER:
DATE OF SUBMITTAL:

(Evidence by Agreement dated __________).

was released from escrow and personally handed to the below named individual acknowledging receipt, representing the DB TEAM/DEPARTMENT, by the ESCROW AGENT upon the presentation of the required documentation pursuant to Article IV of Attachment 3 to this Exhibit 24, Release from Escrow, of the agreement dated __________, 20__, a copy of such documentation is attached hereto.

Acknowledgment of Receipt:

________________________________________________________________________

Acknowledgment of Release:

________________________________________________________________________

ESCROW AGENT
ESCROW CONTAINER SEAL NUMBERS:
EXHIBIT 24
Attachment 3

Escrow Agreement for Bid Documents

THIS AGREEMENT is made and entered into this ________ day of ________, 20___, by and among the Georgia Department of Transportation; an agency of the State of Georgia, hereinafter called the “DEPARTMENT”; and Superior Construction Company Southeast, LLC; hereinafter called the "DB TEAM"; and Iron Mountain Intellectual Property Management, hereinafter called the “ESCROW AGENT”.

WHEREAS, the Department awarded a project on November 2, 2018, based on a bid proposal submitted by the DB TEAM, hereinafter called the "PROPOSAL", for the construction of Project Number 210327-, Richmond County(ies), Georgia, hereinafter called the "PROJECT", pursuant to which the DB TEAM shall cause the work therein to be designed and constructed; and

WHEREAS, the DEPARTMENT and DB TEAM are desirous of entering into an Escrow Agreement, to provide for specific contingencies governing the escrow and control of the PROPOSAL bid documentation; hereinafter called "BID DOCUMENTS"; and

WHEREAS, the DEPARTMENT and DB TEAM desire the ESCROW AGENT to hold the BID DOCUMENTS of the DB TEAM;

NOW THEREFORE, for and in consideration of the mutual covenants contained herein, it is agreed by and between the parties hereto that:

ARTICLE I
ESCROW BID DOCUMENTATION

The parties hereto agree to the establishment of Escrow of the BID DOCUMENTS for the PROPOSAL. It is the understanding of the parties hereto that the DEPARTMENT shall pay the ESCROW AGENT, as determined by separate agreement, for the escrow of the BID DOCUMENTS submitted to the ESCROW AGENT under the terms of this Agreement.

ARTICLE II
ACKNOWLEDGMENT

By its signature below, the ESCROW AGENT hereby acknowledges receipt from the DEPARTMENT and DB TEAM of a sealed container bearing the DB TEAM’S name, address and Project
Number assigned by the DEPARTMENT and containing, as specified by the affidavit of the DB TEAM, the PROPOSAL BID DOCUMENTS for the aforementioned PROJECT.

ARTICLE III
DEPOSIT OF BID DOCUMENTS

The PROPOSAL BID DOCUMENTS shall remain on deposit with the ESCROW AGENT until those conditions of release, as specified in ARTICLE IV, RELEASE FROM ESCROW, are met. As long as the BID DOCUMENTS remain in escrow with the ESCROW AGENT, the ESCROW AGENT shall not allow any person access, to gain possession, or to in any way interfere with the sealed BID DOCUMENT container.

ARTICLE IV
RELEASE FROM ESCROW

Upon being presented, by the DEPARTMENT with a DB TEAM signed final Standard Release Form for the DB Agreement for the PROJECT, the ESCROW AGENT shall deliver to the DB TEAM the sealed container bearing the DB TEAM'S name and address and project number on it. The ESCROW AGENT is also authorized to release the BID DOCUMENT sealed container to the DEPARTMENT without the DB TEAM'S signed consent subject to the following conditions:

1. The DB TEAM has provided written notification to the Department of the DB TEAM'S intention to file a claim related to the DB Agreement for the PROJECT; or

2. The DB TEAM has initiated litigation against the Department relating to the DB Agreement for the PROJECT.

Prior to any release from escrow to the DEPARTMENT, the ESCROW AGENT shall verify that either condition of release to the Department, as stated above, has been met by providing written notice to the DB TEAM of the ESCROW AGENT'S intention to release the PROPOSAL BID DOCUMENTS to the DEPARTMENT. Such written notice from the ESCROW AGENT shall be sent by certified mail no less than ten (10) calendar days prior to release to the DEPARTMENT. Upon any release from escrow of the PROPOSAL BID DOCUMENT container the ESCROW AGENT shall cause the execution of Attachment 2, Escrow Release for PROPOSAL BID DOCUMENTS, as attached hereto and incorporated herein as if fully contained, by the party receiving the BID DOCUMENT container.
ARTICLE V
INDEMNITY

The DB TEAM agrees to indemnify and hold the ESCROW AGENT harmless against any loss, claim, damage, liability or expenses incurred in connection with any action, suit, proceeding, claim or alleged liability arising from this Escrow Agreement, provided, however, that the ESCROW AGENT shall not be so indemnified or held harmless for its negligence or acts of bad faith by it or any of its agents or employees.

ARTICLE VI
NOTICES

All notices and other communication shall be in writing and shall be deemed to have been duly given and delivered if mailed by certified mail, return receipt requested, postage prepaid to the addresses stated herein:

DEPARTMENT:
Georgia Department of Transportation
ATTN: General Counsel
600 West Peachtree Street
Atlanta, Georgia 30308

DB TEAM:
Superior Construction Company Southeast, LLC
Attention: Pete Kelley
7072 Business Park Boulevard North
Jacksonville, FL 32256

ESCROW AGENT:
[GDOT’s contracted escrow agent]
[Attention: name]
[Address 1]
[Address 2]
ARTICLE VII
DUTIES OF ESCROW AGENT

The duties and responsibilities of the ESCROW AGENT shall be limited to those expressly set forth herein and the ESCROW AGENT shall act only in accordance with this ESCROW Agreement.

Notwithstanding specific provisions hereunder, the ESCROW AGENT shall at all times act upon and in accordance with the joint written instructions of the DEPARTMENT and DB TEAM.

ARTICLE VIII
LAWS

This Escrow Agreement shall be deemed to have been executed in Fulton County, Georgia and the laws of the State of Georgia shall apply.

ARTICLE IX
ASSIGNMENT

This Escrow Agreement shall not be assigned without the written consent of all the parties hereto.

ARTICLE X
SURVIVAL OF CONTRACT

Except as may be expressly modified, all terms and conditions of this Escrow Agreement remain in full force and effect. The establishment of this Escrow Agreement is limited solely by the contingency of release of the PROPOSAL BID DOCUMENTS by the DB TEAM to the DEPARTMENT, as established by Article IV, Release From Escrow. Nothing contained herein shall alter the rights of the parties hereto.

The covenants herein contained shall, except as otherwise provided, accrue to the benefit of and be binding upon the successors and assigns of the parties hereto.
IN WITNESS WHEREOF, the parties hereunto set their hands and seals the day above first written.

DB TEAM: 
BY: 
(SEAL) 
TITLE: 

ESCROW AGENT: 
BY: 
(SEAL) 
TITLE: 

WITNESS 

DEPARTMENT: 
BY: 
(SEAL) 
TITLE: 

WITNESS 

ESCROW CONTAINER SEAL NUMBERS:
EXHIBIT 25

Opinion of Counsel

Opinion of Counsel not required.

Legal Counsel identified as:
Name____________________
Address__________________
Phone____________________
Georgia Department of Transportation

VOLUME 2

Technical Provisions
For
Design-Build Agreement
P.I. No. 210327-

I-20 at Savannah River Bridge Replacements and Roadway Widening Project
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SS 936 – Closed-Circuit Television (CCTV) Camera System
SS 939 – Communications and Electronic Equipment
1 GENERAL

1.1 Project Design

Supplement the following to Section 1.1 of Volume 3:

The DB Team’s Design Documents for the Project shall comply with all requirements set forth in the DB Documents. The DB Team’s Design Documents for the Project shall be consistent with the following:

- Environmental Document Approvals
- Concept Report

1.2 Project Scope

Supplement the following to Section 1.2 of Volume 3:

The DB Team shall be responsible for the design and construction of the Project as required by the Design-Build Agreement, including design, design-related activities, permitting, Utility Adjustments, construction, and related Work.

The DB Team shall not rely on the physical description contained herein to identify all Project components. The DB Team shall determine the full scope of the Project through thorough examination of the DB Documents and the Project or as may be reasonably inferred from such examination.

The Work includes replacing and widening the existing I-20 bridges over the Augusta Canal and Savannah River, widening and reconstruction of I-20 roadway, and other related Work. The Project is located along I-20, beginning approximately 3,340 feet west of the Augusta Canal bridges in Richmond County, Georgia, and extending easterly beyond the Savannah River bridges to the first interchange (Exit 1, West Martintown Road) in South Carolina (Aiken County). The Project includes construction of three travel lanes with paved outside and inside shoulders in each direction and replacement of four existing bridges. The overall Project length is approximately 2.4 miles. The Work also includes the addition of a traffic signal at the intersection of West Martintown Road and the I-20 EB off-ramp along with dual left turn lanes and a dedicated right-turn lane.

1.2.1 Design and Construction Requirements

Supplement the following to Section 1.2.1 of Volume 3:

The DB Team shall adhere to the requirements of the Agreement and the Technical Provisions for the general administration and management of the Project, specifically including those provisions in Section 2 and Section 3.

The DB Team shall design and construct Georgia Work and the portion of the South Carolina Work that includes the Savannah River bridges to the east end of the east
approach slabs according to the Technical Provisions, excluding Attachment 1-1 to Volume 2.

The DB Team shall *design* and *construct* South Carolina Work from the east end of the east approach slabs of the Savannah River Bridges to the first interchange (Exit 1, West Martintown Road) in South Carolina (Aiken County) according to the following:

- The design shall be done according to the Technical Provisions; provided that in the event of any conflict, ambiguity or inconsistency between Volume 2, Attachment 1-1 and the Technical Provisions; Volume 2, Attachment 1-1 shall take precedence over the Technical Provisions.
- References in Volume 2, Attachment 1-1 to construction means, methods, or any other construction-related requirements shall be disregarded except and to the extent they are required to be applied by the design requirements within Volume 2, Attachment 1-1.
- The construction and acceptance testing shall be done according to the Technical Provisions, except and to the extent that any design requirements in Volume 2, Attachment 1-1 requires construction and acceptance testing that is not addressed in the Technical Provisions, in which case the related construction requirement in Volume 2, Attachment 1-1 shall be used.

In the event of discrepancies between South Carolina Work and Georgia Work requirements or standards and specifications, the DB Team shall request a determination by GDOT regarding which and to what extent GDOT and SCDOT provisions apply. Such determination by GDOT shall not constitute a Relief Event or Compensation Event and shall not relieve the DB Team of its sole responsibility for the design and construction of the Work.

Materials used for Georgia Work and the portion of the South Carolina Work that includes the Savannah River bridges to the east end of the east approach slabs shall be included on Georgia’s Qualified Products List (QPL). Materials used for South Carolina Work from the east end of the east approach slabs of the Savannah River Bridges to the first interchange (Exit 1, West Martintown Road) in South Carolina (Aiken County) shall be included on South Carolina’s Qualified Products Listing (QPL).

### 1.2.2 Errata to the Technical Provisions

In interpreting Georgia and South Carolina Technical Provisions, standards, policies and specifications, the following shall apply:

References to the “Contract” shall mean the Agreement.

As to roles and responsibilities of the Parties:

(a) References to “Resident Construction Engineer,” “Resident Engineer,” or “Engineer” in the context of the provider of compliance or acceptance judgment may mean the DB Team’s Engineer of Record or the DB Team’s Design Quality
Assurance Manager; or it may mean a GDOT representative, or any combination thereof, depending on the context, and which meaning shall be determined by GDOT in its sole discretion and which determination shall be without recourse for the DB Team.

(b) The DB Team shall not take advantage of any apparent conflict, omission, ambiguity, inconsistency, inaccuracy, deficiency, or inadequacy related to the definition or of roles and responsibilities or their application to the execution of the Work. Should it appear that any definition of roles and responsibilities is contrary to the philosophy of those established by the Agreement, it is the responsibility of the DB Team to request a determination by GDOT related to the respective roles and responsibilities of the DB Team and GDOT. Any subsequent decision by GDOT shall be without recourse for the DB Team.

As to the application of Provisions relating to the requirements of the Technical Provisions in Georgia and South Carolina, the following shall apply:

(a) Any uncertainty in application, conflicts, ambiguities, inconsistencies in application, or lack of clarity in regard to items included in the provisions, terms, or definitions used regarding design and construction standards and provisions of one State as they apply to the Work in another State will be interpreted and defined by GDOT, in its sole discretion. Should there be any uncertainty or it appears or is in-fact the case that any application of a State design or construction provision or requirement is uncertain, imprudent, or unworkable, it is the sole responsibility of the DB Team to identify such item and seek GDOT's determination as to which provision or requirement applies. Such determination by GDOT shall not constitute a Relief Event or Compensation Event.

1.3 Transitions to Adjacent Infrastructure, Roadways and Facilities

No additional requirements.
2 PROJECT MANAGEMENT

2.1 General Requirements

No additional requirements.

2.1.1 Management Organization and Personnel

No additional requirements.

2.1.1.1 DBE Manager

No additional requirements.

2.1.2 Partnering

Supplement the following to Section 2.1.2 of Volume 3:

Partnering is a process of collaborative teamwork that allows groups to achieve measurable results through agreements, productive working relationships and achievement of the parties’ mutual goals. The DB Team shall participate in partnering meetings to commence fifteen (15) days after NTP 1 and occur at approximately ninety (90) days intervals thereafter until Final Acceptance. The DB Team’s participation shall include senior leadership of the Lead Contractor and Lead Design Consultant, as well as relevant project manager(s), and/or pertinent subcontractors. GDOT will facilitate such meetings, which may include senior leadership from GDOT and/or other relevant stakeholders including FHWA.

2.1.3 Project Communications

No additional requirements.

2.1.4 Project Management Controls System (PMCS)

Supplement the following to Section 2.1.4 of Volume 3:

The DB Team shall use GDOT’s PMCS, e-Builder, for contract administration processes, including requests for information, Supplemental Agreements, Payment Requests, and DB Team official correspondence. The DB Team shall attend a training session at GDOT’s office, or other mutually agreeable location, within thirty (30) days of the execution of the Agreement. The DB Team shall contact GDOT’s project manager within fourteen (14) days of the execution of the Agreement to schedule the training session. Failure to timely attend the training session may result in delays to the Project.

2.1.5 Document Management

No additional requirements.
2.1.6 Joint Project Inspection
No additional requirements.

2.1.7 Photography
Supplement the following to Section 2.1.7 of Volume 3:

The DB Team shall provide and operate, at a minimum, two (2) streaming cameras to record the construction to begin on issuance of NTP 3 and continue through Substantial Completion. The DB Team shall submit the camera specifications and locations for GDOT’s review and acceptance prior to installation. The DB Team shall ensure that the cameras can provide a timeline navigation system for selecting specific images and times, time date overlay for instant viewing, downloading, and embedding.

2.1.8 Requirements for GDOT Office and Equipment
No additional requirements.

2.2 Project Management Plans
No additional requirements.

2.2.1 Project Management Plan Requirements
No additional requirements.

2.2.2 Administrative Functions
No additional requirements.

2.2.3 Project Team Communications
No additional requirements.

2.2.4 Safety Plan
No additional requirements.

2.2.5 Construction Phasing Plan and Submittal Schedule
No additional requirements.

2.2.6 Public Information and Communications Plan
No additional requirements.

2.2.7 Comprehensive Environmental Protection Program
No additional requirements.
2.2.8 Right of Way Acquisition Plan
No additional requirements.

2.2.9 Demolition and Abandonment Plan
No additional requirements.

2.2.10 Transportation Management Plan
No additional requirements.

2.2.11 Construction Maintenance Limits Plan
No additional requirements.

2.2.12 Maintenance Management Plan
No additional requirements.

2.2.13 Hazardous Materials Management Plan
No additional requirements.

2.3 Quality Management Requirements

2.3.1 General
No additional requirements.

2.3.2 Quality Management Plan
No additional requirements.

2.3.3 Nonconforming Work and Corrective Action
No additional requirements.

2.3.4 Quality Terminology
No additional requirements.

2.3.5 Quality Organization
No additional requirements.

2.3.6 Responsibility and Authority of DB Team Staff
No additional requirements.

2.3.7 Design Quality Management
No additional requirements.
2.3.8 Construction Quality Management
No additional requirements.

2.3.9 Final Inspection
No additional requirements.

2.3.10 Quality Documentation
No additional requirements.

2.4 Safety and Security
No additional requirements.

2.4.1 Safety Management
No additional requirements.

2.4.2 Worksite and Jobsite Analysis
No additional requirements.

2.4.3 Hazard Prevention and Personal Safety
No additional requirements.

2.4.4 Training
No additional requirements.

2.4.5 Incident and Emergency Management
No additional requirements.

2.5 Schedule Requirements
No additional requirements.

2.5.1 General Schedule Requirements
No additional requirements.

2.5.2 Project Schedule Requirements
No additional requirements.

2.5.3 Project Schedule Submittal Requirements
No additional requirements.
2.5.4 Narrative Report Requirements

No additional requirements.

2.5.5 Five-Week Detail Schedules

No additional requirements.

2.5.6 Additional Software Requirements

No additional requirements.

2.6 Progress, Payment Requests, and Payment

No additional requirements.

2.6.1 Schedule of Values (SOV)

No additional requirements.

2.6.2 Draft Payment Request

No additional requirements.

2.6.3 Payment Request Review Meeting

No additional requirements.

2.6.4 Payment Request Approval and Processing

No additional requirements.

2.6.5 Documents Required to be Provided with the Payment Request

No additional requirements.

2.6.6 Limitations on Progress Payments

No additional requirements.

2.6.7 Price Reductions for Nonconforming Work

No additional requirements.

2.6.8 Other Deductions

No additional requirements.

2.6.9 Processing and Payment

No additional requirements.
2.6.10 Prompt Payment to Contractors and Subcontractors

No additional requirements.

2.6.11 Application for Final Payment

No additional requirements.

2.6.12 Final Payment

No additional requirements.

2.6.13 No Waiver

No additional requirements.

2.7 Public Information and Communications

2.7.1 General Requirements

No additional requirements.

2.7.2 Administrative Requirements

No additional requirements.

2.7.3 Project Information Coordinator (PIC)

No additional requirements.

2.7.4 Monthly Public Information and Communications Reporting

No additional requirements.

2.7.5 Emergency Event Communications

No additional requirements.

2.7.6 Disseminating Public Information

No additional requirements.

2.7.7 Public Involvement Action Items

Supplement the following to Section 2.7.7 of Volume 3:

DB Team shall support GDOT in the planning and implementation of up to ten (10) public meetings, up to twelve (12) stakeholder working group meetings, and up to forty (40) public outreach presentations to inform stakeholders and the public of construction plans and detours. DB Team support shall include attendance of the DB Team PIC and other DB Team SMEs at meetings, upon request.
3 DESIGN AND SUBMITTALS

3.1 General

No additional requirements.

3.1.1 GDOT Standards and Manuals

Supplement Section 3.1.1 with the following:

Reference Section 1.2.1 of Volume 2 regarding applicability of GDOT and SCDOT standards and specifications and manuals.

The DB Team shall meet all requirements of the AASHTO Manual for Assessing Safety Hardware (MASH), 2nd Edition, 2016. The DB Team shall ensure that its designs and installation meet the required MASH implementation dates during the life of the contract.

Special Provision 621 (Concrete Barrier) is required; see Volume 2, Attachment 3-1.

3.1.2 Detailed Estimate of Quantities

No additional requirements.

3.2 Design

3.2.1 Design Workshop

No additional requirements.

3.2.2 Design Reviews

Supplement Section 3.2.2 with the following:

The DB Team shall facilitate a field plan review(s) with GDOT for review of the DB Team’s design plans. At a minimum, the DB Team’s Engineer of Record (EOR) or design project manager and a representative of the DB Team’s contractor shall attend.

3.2.3 Changes Subsequent to Review

No additional requirements.

3.3 Other Agency Approvals

3.3.1 Federal Aviation Administration

No additional requirements.

3.4 Design Data Book

No additional requirements.
3.5 Design Submittals and Progress of Design Work

Supplement the following to Section 3.5 of Volume 3:

The DB Team shall provide Project Submittals included in Table 3-1: Master Submittal List. Table 3-1 may not be all-inclusive or exhaustive. It is the DB Team’s responsibility to determine and submit all items required by the DB Documents. Each required Submittal shall be delivered to GDOT in compliance with the review times provided. The times provided are specifically for the review period required for GDOT to comment and subsequently accept (if all requirements of the DB Documents are met) or approve, as applicable. Not all Submittals listed in Table 3-1: Master Submittal List may be required for the Project and some Submittals may be combined into a single Submittal such as the Project Management Plans; DB Team shall coordinate with GDOT prior to combining any Submittals and receive GDOT approval prior to omitting any listed Submittals.

ABBREVIATIONS FOR TABLE

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<tr>
<th>Abbreviation</th>
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<td>ASC</td>
<td>Point File for Survey Data</td>
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<td>AR</td>
<td>As Required</td>
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<tr>
<td>DTM</td>
<td>Digital Terrain Model</td>
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<tr>
<td>FS</td>
<td>Full-size paper – meets GDOT Plan Presentation Guide</td>
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<tr>
<td>HC</td>
<td>Hard Copy – 8½ x 11 unless otherwise noted</td>
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<tr>
<td>HS</td>
<td>Half-size paper – meets GDOT Plan Presentation Guide</td>
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<td>MP</td>
<td>Microsoft Project</td>
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<td>PAS</td>
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<td>PDF</td>
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### Table 3-1: Master Submittal List

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<td>DB Team Internal Quality Audits</td>
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<td>DB Team Non-Conformance Reports</td>
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<td>AR, PDF</td>
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<td>Plans: 2 for each Utility Owner +3 for Dept. and MS files</td>
<td>UIA + 45 Calendar days</td>
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<td>FS, HS, PDF, MS</td>
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<td>5 days for Dept. + 90 days for each Utility Owner</td>
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<td>Preliminary Utility Status Report</td>
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<td>NTP 1 + 180 days Concurrently with Accepted Relocated Utility Plans and (URPN Letter 6 - Notice to Proceed with Permit)</td>
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<td>Utility A/O Claims of Real Property Interests</td>
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<td>Utility Record Drawings (As-Built Plans)</td>
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<td>Construction Record Drawings</td>
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**Lighting/Electric/Power**

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**Drainage**

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**Structures/Bridges**

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<td></td>
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<td>Railroad</td>
<td></td>
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<td>14</td>
<td>2</td>
<td>Submittals as required per railroad requirements</td>
<td>AR</td>
<td>AR</td>
<td>** and as required by the railroad</td>
<td>As required by the railroad</td>
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<tr>
<td></td>
<td></td>
<td>Signing, Pavement Marking and Signalization</td>
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<tr>
<td>16</td>
<td>3</td>
<td>Preliminary Signing and Marking, Signal Plans (per phase)</td>
<td>AR, FS, HS, PDF</td>
<td>2, 6, 1</td>
<td>Per the approved Submittal Schedule</td>
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<tr>
<td>16</td>
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<td>Final Signing and Marking, Signal Plans</td>
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<td>2, 6, 1</td>
<td>Per the approved Submittal Schedule</td>
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</tr>
<tr>
<td>16</td>
<td>3</td>
<td>Preliminary Permanent Signing Unveiling Plan</td>
<td>AR, PDF</td>
<td>1</td>
<td>120 days prior to open to Traffic</td>
<td>21</td>
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<tr>
<td>16</td>
<td>3</td>
<td>Final Permanent Signing Unveiling Plan</td>
<td>AR, PDF</td>
<td>1</td>
<td>60 days prior to open to Traffic</td>
<td>14</td>
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<tr>
<td>16</td>
<td>3</td>
<td>Traffic Signal Permitting/Engineering Study (per phase)</td>
<td>AR, PDF</td>
<td>1</td>
<td>Per the approved Submittal Schedule</td>
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<tr>
<td>16</td>
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<td>New Sign requests</td>
<td>AR, PDF</td>
<td>1</td>
<td>As needed</td>
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<td>16</td>
<td>3</td>
<td>Overhead Sign Support Structures Concept Plans</td>
<td>AR, PDF</td>
<td>1</td>
<td>Per the approved Submittal Schedule</td>
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<tr>
<td>16</td>
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<td>Overhead Sign Support Structures Final Plans</td>
<td>AR, PDF</td>
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<td>Per the approved Submittal Schedule</td>
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<tr>
<td>16</td>
<td>3</td>
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<td>1</td>
<td>Per the approved Submittal Schedule</td>
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<tr>
<td>16</td>
<td>3</td>
<td>Traffic Signal O &amp; M Documentation</td>
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<td>1</td>
<td>Per the approved Submittal Schedule</td>
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<tr>
<td></td>
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<td>ITS and Network</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>17</td>
<td>2</td>
<td>Preliminary ITS Plans</td>
<td>AR, FS, HS, PDF</td>
<td>2, 6, 1</td>
<td>Per the approved Submittal Schedule</td>
<td>30</td>
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<tr>
<td>17</td>
<td>2</td>
<td>Final ITS Plans</td>
<td>AR, FS, HS, PDF</td>
<td>2, 6, 1</td>
<td>Per the approved Submittal Schedule</td>
<td>30</td>
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<tr>
<td>Section</td>
<td>Volume</td>
<td>Submittal Item</td>
<td>Format</td>
<td>Quantity</td>
<td>Delivery Date</td>
<td>Review Period* (Days)</td>
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<tr>
<td>---------</td>
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<td>-------------------------------------------------------------------------------</td>
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<tr>
<td>17</td>
<td>2</td>
<td>3D Visualization (ITS) Model</td>
<td>AR</td>
<td>1</td>
<td>Per the approved Submittal Schedule Prior to Preliminary Plans</td>
<td>30</td>
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<tr>
<td>17</td>
<td>2</td>
<td>Inventory of Existing ITS</td>
<td>AR, PDF</td>
<td>1</td>
<td>30 days from NTP 1</td>
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<td>17</td>
<td>2</td>
<td>ITS Maintenance and Repair Plan</td>
<td>AR, PDF</td>
<td>1</td>
<td>30 days from NTP 1</td>
<td>30</td>
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<td>17</td>
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<td>ITS Responsive and Diagnostic Repair Plan</td>
<td>AR, PDF</td>
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<td>30 days from NTP 1</td>
<td>30</td>
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<tr>
<td>17</td>
<td>2</td>
<td>Fiber Duct Validation Report</td>
<td>AR, PDF</td>
<td>1</td>
<td>90 days from NTP 1</td>
<td>NA</td>
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<tr>
<td>17</td>
<td>2</td>
<td>Installation and Integration Plan</td>
<td>AR, PDF</td>
<td>1</td>
<td>120 days from NTP 1</td>
<td>90</td>
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<tr>
<td>17</td>
<td>2</td>
<td>Final Record Drawings</td>
<td>AR, FS, HS, PDF</td>
<td>2, 6, 1</td>
<td>30 days After to Substantial Completion</td>
<td>60</td>
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<tr>
<td>17</td>
<td>2</td>
<td>Manufacturer Equipment Documentation/Manufacturer Warranties</td>
<td>AR, PDF</td>
<td>1</td>
<td>120 days prior to Substantial Completion</td>
<td>14</td>
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<tr>
<td><strong>Traffic Control</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>2, 18</td>
<td>3</td>
<td>Transportation Management Plan</td>
<td>AR, PDF</td>
<td>1</td>
<td>Within 120 days from NTP 1</td>
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<tr>
<td>18</td>
<td>3</td>
<td>Traffic Control Plans (each Phase)</td>
<td>AR, PDF</td>
<td>1</td>
<td>Per the approved Submittal Schedule</td>
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<tr>
<td>18</td>
<td>3</td>
<td>GP lane closure or reduced widths</td>
<td>AR, PDF</td>
<td>1</td>
<td>Must also meet PICP for public coordination timing</td>
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<td><strong>Maintenance During the Design-Build Period</strong></td>
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<td>2, 19</td>
<td>3</td>
<td>Construction Maintenance Limits Plan</td>
<td>AR, FS, HS, PDF</td>
<td>2, 6, 1</td>
<td>150 days from NTP 1, or Prior to given Phase; approval before construction</td>
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<tr>
<td><strong>Additional Submittals</strong></td>
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<td></td>
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</tr>
<tr>
<td>3</td>
<td>3</td>
<td>Conceptual Layout Plan</td>
<td>AR, FS, HS, PDF</td>
<td>6, 10, 1</td>
<td>**</td>
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<td>3</td>
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<td>Preliminary Plans (60%) (complete set)</td>
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<td>6, 10, 1</td>
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<td>3</td>
<td>3</td>
<td>Interim Design</td>
<td>AR, FS, HS, PDF</td>
<td>6, 10, 1</td>
<td>**</td>
<td>30</td>
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<tr>
<td>3</td>
<td>3</td>
<td>Final Plans (100%) per Construction Phase (complete set)</td>
<td>AR, FS, HS, PDF</td>
<td>6, 10, 1</td>
<td>**</td>
<td>45</td>
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<td>Section</td>
<td>Volume</td>
<td>Submittal Item</td>
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<td>Quantity</td>
<td>Delivery Date</td>
<td>Review Period* (Days)</td>
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<tr>
<td>3, 4</td>
<td>3</td>
<td>Notice of Intent (NOI) with final/signed Erosion Control Plans</td>
<td>AR, PDF</td>
<td>1</td>
<td>**</td>
<td>14</td>
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<tr>
<td>3</td>
<td>3</td>
<td>Shop Drawings</td>
<td>AR, PDF</td>
<td>1</td>
<td>**</td>
<td>14</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
<td>Temporary Works - where public safety may be affected</td>
<td>AR, PDF</td>
<td>1</td>
<td>**</td>
<td>14</td>
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<tr>
<td>3</td>
<td>3</td>
<td>Plan Revisions During Construction</td>
<td>AR, PDF</td>
<td>1</td>
<td>**</td>
<td>14</td>
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<td>3</td>
<td>3</td>
<td>Record Drawings (As-Built Plans) per Construction Phase</td>
<td>AR, FS, HS, PDF</td>
<td>6, 10, 1</td>
<td>**</td>
<td>14</td>
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<tr>
<td>3, 12</td>
<td>3</td>
<td>Drainage Plans</td>
<td>AR, FS, HS, PDF</td>
<td>2, 6, 1</td>
<td>**</td>
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<tr>
<td>3, 12</td>
<td>3</td>
<td>Hydraulic and Hydrology Report (shall be submitted together with the Bridge Preliminary Layout)</td>
<td>AR, PDF</td>
<td>1</td>
<td>**</td>
<td>30</td>
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<td>3, 11</td>
<td>3</td>
<td>Pavement Joints and Elevations</td>
<td>AR, PDF</td>
<td>1</td>
<td>**</td>
<td>14</td>
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<tr>
<td>12</td>
<td>3</td>
<td>Restoration/Mitigation</td>
<td>AR, PDF</td>
<td>1</td>
<td>**</td>
<td>14</td>
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<tr>
<td>3, 10</td>
<td>3</td>
<td>Grading Plans</td>
<td>AR, FS, HS, PDF</td>
<td>2, 6, 1</td>
<td>**</td>
<td>14</td>
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<tr>
<td>15</td>
<td>3</td>
<td>Landscaping and Permanent Erosion Control Plans</td>
<td>AR, FS, HS, PDF</td>
<td>2, 6, 1</td>
<td>**</td>
<td>14</td>
</tr>
<tr>
<td>3, 12</td>
<td>3</td>
<td>Temporary Erosion Control Plans</td>
<td>AR, FS, HS, PDF</td>
<td>2, 6, 1</td>
<td>**</td>
<td>14</td>
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<tr>
<td>16</td>
<td>3</td>
<td>Intersection Design Studies</td>
<td>AR, PDF</td>
<td>1</td>
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<td>14</td>
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<tr>
<td>3</td>
<td>3</td>
<td>Draft Design Specifications, Reports, Whitepapers, etc.</td>
<td>AR, PDF</td>
<td>1</td>
<td>**</td>
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<tr>
<td>3</td>
<td>3</td>
<td>Final Design Specifications, Reports, Whitepapers, etc.</td>
<td>AR, PDF</td>
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<tr>
<td>3</td>
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<td>Site observation compliance report</td>
<td>AR, PDF</td>
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<td>All</td>
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<td>Meeting Minutes</td>
<td>AR, PDF</td>
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<td>Subcontracts</td>
<td>AR, PDF</td>
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<td>In accordance with the Construction Manual</td>
<td>14</td>
</tr>
</tbody>
</table>
*Review period is the period required for the generation of comments or the review time to determine the state or status of the document. Multiple review periods may be required for any submittal and shall be planned for by the DB Team in securing "accepted" or "approved" status from GDOT.

If a submittal is not listed, the review time shall be 30 days per Volume 1, Article 6.3.2.

** Based upon the accepted Baseline Schedule

*** Time of review will be based upon actual impact to Project

**** See Technical Provisions

**BOLDED and italicized** = requires FHWA review and approval
3.6 Additional Submittal Requirements

3.6.1 Staged Design Submittals
No additional requirements.

3.6.2 Changes to Accepted and Released for Construction Submittals
No additional requirements.

3.6.3 Presentation Requirements
No additional requirements.

3.6.4 Construction Plans Organization and Sheet Index
No additional requirements.

3.6.5 Computations
No additional requirements.

3.6.6 Submittal Formats
No additional requirements.

3.6.7 Additional Specifications
No additional requirements.

3.6.8 Submittals Process
No additional requirements.

3.6.9 Required Participants of the Process
No additional requirements.

3.6.10 GDOT Design Review Process
No additional requirements.

3.7 Shop Drawings and Temporary Works Submittals

3.7.1 General
No additional requirements.

3.7.2 Work Items Requiring Shop Drawings
Supplement the following to Section 3.7.2 of Volume 3:
Erection plans shall be submitted for curved steel bridges.

3.7.3 Schedule of Submittals
No additional requirements.

3.7.4 Style, Numbering, and Material of Submittals

3.7.4.1 Drawings
No additional requirements.

3.7.4.2 Other Documents
No additional requirements.

3.7.4.3 Qualified Products
No additional requirements.

3.7.4.4 DB Team-Originated Design
No additional requirements.

3.7.4.5 Temporary Works
No additional requirements.

3.7.4.6 Formwork and Scaffolding
No additional requirements.

3.7.4.7 Other Miscellaneous Design and Structural Details Furnished by the DB Team in Compliance with the Contract
No additional requirements.

3.7.5 Processing of Shop Drawings

3.7.5.1 DB Team Responsibility for Accuracy and Coordination of Shop Drawings
No additional requirements.

3.7.5.2 Scope of Review by the Shop Drawing Checking Engineer
No additional requirements.

3.7.5.3 Special Review by the Shop Drawing Checking Engineer of Shop Drawings for Construction Affecting Public Safety
No additional requirements.
3.7.6 Other Requirements for Shop Drawings for Bridges

3.7.6.1 Shop Drawings for Structural Steel and Miscellaneous Metals
No additional requirements.

3.7.6.2 Shop Drawings for Concrete Structures
No additional requirements.

3.7.6.3 Special Construction Submittals
No additional requirements.

3.7.6.4 Shop Drawings Requiring Railroad Coordination
No additional requirements.

3.7.6.5 Modifications on Construction
No additional requirements.

3.8 Release for Construction Documents
No additional requirements.

3.9 Record Drawings and Project Closeout
No additional requirements.

3.9.1 Final Inspection
No additional requirements.

3.9.2 Required Documents
No additional requirements.

3.9.3 Final Acceptance
No additional requirements.
4 ENVIRONMENTAL

4.1 General

Supplement the following to Section 4.1 of Volume 3:

This Project incorporates requirements of two states, Georgia and South Carolina. It has been agreed between the two state DOTs and the federal and state resource agencies that the Georgia resource agencies will take the lead on Environmental Documentation, permits and re-evaluations. The DB Team shall coordinate with the South Carolina resource agencies when required.

GDOT will undertake protected species mussel surveys prior to construction. Multiple surveys are required based on water temperature and flow rate, with the final survey conducted within 14 days prior to the start of any in-water work. The DB Team shall coordinate with GDOT on timing of the mussel surveys and shall provide a construction staging plan(s) (a GDOT Section 20 sheet(s) per the EDG) that show(s) the anticipated maximum construction work area for use in conducting the mussel surveys. Any mussel relocation activities will be conducted by GDOT prior to the start of in-water work.

The Augusta Canal is a licensed Federal Energy Regulatory Commission (FERC) facility. As part of the FERC license agreement, the Augusta Utilities Department must inspect the Augusta Canal embankments three times per day (one each 8-hour shift). This inspection is done via the Augusta Canal towpath paralleling the canal banks. Passage for canal inspectors (Augusta Canal Authority and/or Augusta Utilities Department) shall be maintained during construction by providing a 7-foot by 7-foot clearance envelope, even during periods when the towpath may be closed to public use. The DB Team shall coordinate with the Augusta Utilities Department and the Augusta Canal Authority regarding maintaining the necessary access/passage for embankment inspections.

Nighttime closures of the Augusta Canal towpath are permitted (9:00pm to 6:00am). Additionally, up to two full closures of the Augusta Canal towpath shall be permitted during construction. Each full towpath closure shall not exceed the duration provided in Exhibit 9 of the Agreement. Full towpath closures are only permitted during the period of December 1 through February 29.

No permanent alignment shift of the Augusta Canal towpath is allowed.

The DB Team shall be responsible for any repairs and/or maintenance required to the towpath resulting from the DB Team’s operations until Final Acceptance.

A minimum of 25 feet of horizontal clearance within the Augusta Canal for navigation/recreation use shall be maintained at all times, with the exception of the allowable closure timeframe permitted in Exhibit 9 of the Agreement. Reducing the
horizontal clearance within the Augusta Canal to less than 25 feet is only permitted during the period of December 1 through March 31.

Since the Project crosses the Augusta Canal boundaries, FERC’s design review process shall be followed. This will include a review of the Project in relation to dam safety and the integrity of the canal embankments. The DB Team shall provide copies of the DB Team’s preliminary and final plans, including staging and cofferdam locations, to GDOT for submittal to FERC for review. **This review process takes up to 90 days.** FERC engineers may also visit the construction site several times during construction. The DB Team shall cooperate with FERC providing preliminary and final plans, requested information and construction site access to FERC engineers.

A minimum flowrate of 2,700 cubic feet per second (cfs) shall be maintained within the Augusta Canal at all times through construction.

The Augusta Utilities Department will need to update their current Temporary Construction Emergency Action Plan for construction of this project. The update may include incorporating GDOT and the DB Team’s emergency contact information in the unlikely event of a canal emergency (such as damage to a wall/embankment). The DB Team shall cooperate with the Augusta Utilities Department to provide the information needed to update their Temporary Construction Emergency Action Plan.

### 4.1.1 Standards

*No additional requirements.*

### 4.2 Environmental Approvals

#### 4.2.1 Responsibilities Regarding Environmental Documents

*Supplement the following to Section 4.2.1 of Volume 3:*

The DB Team shall implement the commitment(s) per the Environmental Document and Environmental Commitments and adhere to the Special Provision 107.23(H) requirements. The DB Team shall be responsible for the purchase of all required mitigation credits. This supporting information is listed below:

**Table 4-1: Environmental Documentation Contained in Section 4 Attachments**

<table>
<thead>
<tr>
<th>Attachment</th>
<th>Document</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attachment 4-1</td>
<td>• Environmental Commitments Table (includes identification of responsible parties)</td>
</tr>
<tr>
<td>Attachment 4-2</td>
<td>• Special Provisions Section 107.23(H)</td>
</tr>
</tbody>
</table>
Temporary placement of material for equipment access is allowed to be placed within the dry work area provided by a cofferdam, as long as any material used (regardless of size) is fully contained by geotextile fabric to prevent loose or crushed debris from remaining post-construction or being released into the river. As stated in Attachment 4-2, use of earth or rock placed directly (without geotextile fabric) on the Savannah River bed or the Augusta Canal bed is prohibited. Use of wooden or steel mats placed directly on the Savannah River bed or the Augusta Canal bed will require evaluation in an ecology addendum and shall be subject to the approvals of the resource agencies and GDOT. The DB Team shall bear the full risk of obtaining any such approvals and no additional time will be granted.

4.2.2 GDOT Review and Approval of Environmental Documents and Permits

Replace Table 4-2 and the accompanying notes with the following:

United States Army Corps of Engineers (USACE) Section 404 permit at this time is proposed as two General Permits, one permit for each bridge crossing (Savannah River and Augusta Canal).

Table 4-2: DB Team-Led Environmental Permit Approval

<table>
<thead>
<tr>
<th>Permit Required</th>
<th>Agency Review and Issuance Time Period (Calendar Days)(4)</th>
<th>Listed Applicant</th>
<th>Preparer of Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States Army Corps of Engineers (USACE) Section 404</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Section 404 General Permit (1)</td>
<td>140</td>
<td>GDOT</td>
<td>DB Team</td>
</tr>
<tr>
<td>Section 404 Individual Permit (2)</td>
<td>240</td>
<td>GDOT</td>
<td>DB Team</td>
</tr>
<tr>
<td>Subsurface testing of all Underground Storage Tanks and Hazardous Materials</td>
<td>150</td>
<td>GDOT</td>
<td>DB Team</td>
</tr>
<tr>
<td>National Pollutant Discharge Elimination System (NPDES) Construction General Permit (GAR100002), Notice of Intent (NOI) (3) for Georgia Work</td>
<td>14</td>
<td>DB Team</td>
<td>DB Team</td>
</tr>
<tr>
<td>NPDES Construction General Permit (GAR100003), Notice of Intent (NOI)(3) for Georgia Work</td>
<td>90</td>
<td>DB Team</td>
<td>DB Team</td>
</tr>
<tr>
<td>NPDES Construction General Permit (GAR150000), Notice of Termination (NOT) (3) for Georgia Work</td>
<td>90</td>
<td>DB Team</td>
<td>DB Team</td>
</tr>
<tr>
<td>Georgia Stream Buffer Variance</td>
<td>150</td>
<td>GDOT</td>
<td>DB Team</td>
</tr>
</tbody>
</table>

(1) This applies to Section 404 permitting and if additional impacts are incurred after the permit has been approved, a new permit that covers all impacts is required and the original review times
apply to the new permit. No work is authorized in the areas of the previous permit until the new permit is approved and construction authorization is received.

(2) This applies to Section 404 permitting impacts which may exceed the cumulative threshold for a General Permit.

(3) The current NPDES General Permit is set to expire July 31, 2018. A new NPDES General Permit is anticipated to go into effect on August 1, 2018. Information on the permit and proposed changes can be found at https://epd.georgia.gov/npdes-construction-storm-water-general-permits.

(4) The review and issuance time periods shall commence once a completed permit package that complies with the requirements of the DB Documents is accepted by GDOT and submitted to the issuing agency and end once the permit is issued by the appropriate Governmental Entity. Therefore, the DB Team shall schedule several review periods to ensure proper planning to accomplish the entire process for each required permit. Each GDOT review period is thirty (30) days. Should the Submittal not be complete or rejected as provided in Section 3, each subsequent review period shall be fifteen (15) days, and is excluded from the timeframe in Table 4-2 above.

Regarding the USACE Section 404 permits, both the Savannah District and the Charleston District of the USACE will be conducting reviews. Both districts have separate form requirements. The applications shall be submitted to the Savannah District, which will distribute the appropriate permit application to the Charleston District. SCDOT shall be listed as the applicant on the Charleston District permit application.

The DB Team responsibilities for the South Carolina NPDES permit can be found in Attachment 1-1.

### 4.3 Comprehensive Environmental Protection Program

*Supplement the following to Section 4.3 of Volume 3:*

The DB Team shall adopt a proactive approach for overseeing and inspecting environmental Work during construction to help guard against unanticipated impacts to the environment. The DB Team shall be responsible for complying with the scope of environmental commitments (Environmental Commitments Table), Special Provision 107.23(H), and other Environmental Documents. To that end, the DB Team shall develop, execute, and maintain a Comprehensive Environmental Protection Program (CEPP) for the Work to ensure environmental compliance with all applicable environmental laws and commitments. See Section 4.3 of Volume 3 for a detailed description of the Program.

### 4.4 Hazardous Materials Management Plan

*No additional requirements.*
5 RESERVED
6 UTILITY ADJUSTMENTS

6.1 General
No additional requirements.

6.1.1 Standards
No additional requirements.

6.1.2 Memorandum of Understanding (MOU)
Supplement the following to Section 6.1.2 of Volume 3:
See Attachment 6-1: Memorandums of Understanding for requirements related to coordination and relocations for all Utility owners within the Project Limits.

6.1.3 Responsibilities of the DB Team
Supplement the following to Section 6.1.3 of Volume 3:
See Attachment 6-2: Utility Insurance Requirements and Special Provisions for the special provisions regarding the insurance, coordination, design, construction and relocation of utilities.

If the DB Team encounters utilities servicing the South Carolina Welcome Center that are under the control of SCDOT and that are in conflict with the Work, the DB Team shall coordinate the relocation of those utilities with GDOT and SCDOT and the cost of coordination and any relocations shall be the DB Team’s responsibility.

6.1.3.1 DB Team Pre-Construction Coordination
No additional requirements.

6.1.3.2 DB Team Design Activities
No additional requirements.

6.1.3.3 DB Team Construction Activities
No additional requirements.

6.1.3.4 Worksite Utility Coordination Supervisor (WUCS)
No additional requirements.

6.1.3.5 General Responsibilities of GDOT
No additional requirements.

6.1.3.6 Utility Adjustment Relocation
No additional requirements.
6.1.3.7 When Utility Adjustment is Required

No additional requirements.

6.1.4 Certain Components of the Utility Adjustment Work

6.1.4.1 Betterments

No additional requirements.

6.1.4.2 Protection in Place

No additional requirements.

6.1.4.3 Early Adjustments

No additional requirements.

6.2 Administrative Requirements

6.2.1 Communications

6.2.1.1 Communication with Utility Owners: Meetings and Correspondence

No additional requirements.

6.2.2 Real Property Matters

No additional requirements.

6.2.2.1 Documentation of Existing Utility Property Interests - Affidavits

No additional requirements.

6.2.2.2 Acquisition of Replacement Utility Property Interests

No additional requirements.

6.2.2.3 Georgia Utility Permitting System (GUPS)

No additional requirements.

6.2.2.4 Documentation Requirements

No additional requirements.

6.2.2.5 Record Keeping

No additional requirements.
6.3 Design

6.3.1 DB Team’s Responsibility for Utility Identification
No additional requirements.

6.3.2 Utility Relocation Plans
No additional requirements.

6.3.2.1 Plans Prepared by the DB Team
No additional requirements.

6.3.2.2 Plans Prepared by the Utility Owner
No additional requirements.

6.3.2.3 Design Documents
No additional requirements.

6.3.2.4 Certain Requirements for Underground Utilities
No additional requirements.

6.3.2.5 Utility Work Plan
No additional requirements.

6.3.2.6 Utility Adjustment Schedule (UAS)
No additional requirements.

6.3.2.7 Revised Work Plan Acceptance
No additional requirements.

6.3.2.8 Post-Let Utility Certification
No additional requirements.

6.4 Construction

6.4.1 Reserved

6.4.2 General Construction Criteria
No additional requirements.

6.4.3 Inspection of Utility Owner Construction
No additional requirements.
6.4.4 Scheduling Utility Adjustment Work  
No additional requirements.

6.4.5 Standard of Care Regarding Utilities  
No additional requirements.

6.4.6 Emergency Procedures  
No additional requirements.

6.4.7 Switch Over to New Facilities  
No additional requirements.

6.4.8 Traffic Control  
No additional requirements.

6.5 Deliverables  
No additional requirements.

6.5.1 Utility Work Plan Submittals  
No additional requirements.

6.5.2 Preliminary Utility Status Report  
No additional requirements.

6.5.3 Subsurface Utility Engineering (SUE) Requirements  
No additional requirements.

6.5.4 Utility As-Built Standard  

6.5.4.1 General As-Built Utility Requirements  
No additional requirements.

6.5.4.2 As-Built Utility CADD Files and Plans Preparation  
No additional requirements.

6.5.4.3 Utility Record Drawings Review and Submittal Process  
No additional requirements.

6.5.4.4 Utility Facility Relocation Acceptance Form  
No additional requirements.
7  RIGHT OF WAY (ROW) – Additional Properties

7.1  General
Supplement the following to Section 7 of Volume 3:
The DB Team shall design and construct the Project within the existing ROW.

7.1.1  Standards
No additional requirements.

7.2  Administrative Requirements
No additional requirements.

7.3  DB Team’s ROW Scope of Services
No additional requirements.

7.4  DB Team Conflict of Interest
No additional requirements.

7.5  Responsibilities of DB Team
Supplement the following to Section 7.5 of Volume 3:
Field establish the limits of ROW by staking at a minimum spacing of 100 feet prior to the construction and ensure no encroachments will occur as a result of construction.

7.6  Responsibilities of GDOT
No additional requirements.

7.7  Responsibilities of the Office of the Attorney General
No additional requirements.

7.8  ROW Acquisition Plan
No additional requirements.

7.9 Acquisition Process Summary
No additional requirements.
7.10 Reserved

7.11 Pre-Acquisition Activities

7.11.1 ROW Plans and Engineering
No additional requirements.

7.11.2 Title Services
No additional requirements.

7.11.3 Reserved
No additional requirements.

7.11.4 Project Inspection Checklist
No additional requirements.

7.11.5 Appraisal Services
No additional requirements.

7.12 Acquisition Activities
No additional requirements.

7.13 Post-Acquisition Activities
No additional requirements.

7.14 Schedule and Reviews
No additional requirements.

7.15 Meetings
No additional requirements.

7.16 Correspondence
No additional requirements.

7.17 File Management and Document Control
No additional requirements.
7.18 Project Tracking and Reporting

No additional requirements.

7.19 Quality Assurance Quality Control and Audits

No additional requirements.
8 GEOTECHNICAL

8.1 General
No additional requirements.

8.1.1 Standards
No additional requirements.

8.2 Design Requirements

8.2.1 Subsurface Geotechnical Investigation by DB Team
Supplement the following to Section 8.2 of Volume 3:
Back-up of calculations and input and output of SCDOT recognized software shall be utilized for the geotechnical reports for the design items located in South Carolina.

8.2.2 Bridge Foundation Investigation (BFI)
No additional requirements.

8.2.3 Dynamic Pile Testing
No additional requirements.

8.2.4 Soil Survey (SS)
No additional requirements.

8.2.5 Pavement Design
No additional requirements.

8.2.6 Wall Foundation Investigation (WFI)
No additional requirements.

8.2.7 High Mast Lighting Foundation
No additional requirements.

8.3 Construction
No additional requirements.

8.4 Reserved
9 SURVEYING AND MAPPING

9.1 General
No additional requirements.

9.1.1 Standards
No additional requirements.

9.2 Administrative Requirements

9.2.1 Ownership
No additional requirements.

9.2.2 Property Owner Notification
No additional requirements.

9.3 Design Requirements
No additional requirements.

9.3.1 Units
No additional requirements.

9.3.2 Survey Control Requirements
No additional requirements.

9.3.3 Conventional Method (Horizontal & Vertical)
No additional requirements.

9.3.3.1 Horizontal Accuracy Requirements for Conventional Surveys
No additional requirements.

9.3.3.2 Vertical Accuracy Requirements for Conventional Surveys
No additional requirements.

9.3.4 Reserved
No additional requirements.

9.3.5 Right of Way Survey
No additional requirements.
9.3.5.1 Accuracy Standard

No additional requirements.

9.3.6 Survey Records and Reports

No additional requirements.

9.4 Construction Requirements

9.4.1 Units

No additional requirements.

9.4.2 Construction Surveys

No additional requirements.

9.4.3 ROW Monuments

No additional requirements.

9.5 Reserved
10 GRADING

10.1 General
No additional requirements.

10.1.1 Standards
No additional requirements.

10.2 Demolition and Abandonment Plan
No additional requirements.

10.3 Slopes and Topsoil
No additional requirements.

10.4 Special Flood Hazard Areas Fill Mitigation
No additional requirements.
11 ROADWAYS

11.1 General
No additional requirements.

11.1.1 Standards
No additional requirements.

11.2 Design Requirements
No additional requirements.

11.2.1 Design Criteria Order of Precedence
No additional requirements.

11.2.2 Vibration Control
No additional requirements.

11.2.3 Blasting
Supplement the following to Section 11.2.3 of Volume 3:
No blasting is allowed in the Augusta Canal.

11.2.4 Control of Access
No additional requirements.

11.2.5 Typical Section(s) and Pavement Design
Typical Section(s) for Roadway Design: see Attachment 11-1.

The DB Team shall remove and upgrade all existing guardrail within the limits of roadway construction that is not otherwise being removed or replaced.

All new pavement for the Project shall, at a minimum, meet the pavement designs identified in Table 11-1. All outside and inside shoulders within the limits of roadway construction for I-20 shall be replaced, at a minimum, with the pavement designs identified in Table 11-1. Pavement in South Carolina shall comply with Volume 2, Attachment 1-1.

Staged construction shall include consideration of using pavement construction widths that don’t force the final roadway surface to have longitudinal joints in the wheel path.
Table 11-1: Pavement Designs

<table>
<thead>
<tr>
<th>I-20 Mainline</th>
<th>Thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plain PC Conc Pavement, CL 1 Conc</td>
<td>12 inches</td>
</tr>
<tr>
<td>Recycled Asph Conc 19 MM Superpave, GP 1 or 2, incl Bitum Matl &amp; H Lime</td>
<td>3 inches</td>
</tr>
<tr>
<td>Graded Aggregate Base Course (GAB)</td>
<td>12 inches</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>I-20 Outside Shoulder (Asphalt Alternative)</th>
<th>Spread Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recycled Asph Conc 12.5mm Superpave, GP 2 Only, incl Bitum Matl &amp; H Lime</td>
<td>220 lb/sy</td>
</tr>
<tr>
<td>Recycled Asph Conc 19mm Superpave, GP 1 or 2, incl Bitum Matl &amp; H Lime</td>
<td>220 lb/sy</td>
</tr>
<tr>
<td>Recycled Asph Conc 25mm Superpave, GP 1 or 2, incl Bitum Matl &amp; H Lime</td>
<td>770 lb/sy</td>
</tr>
<tr>
<td>GAB – 16 inches</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>I-20 Outside Shoulder (Concrete Alternative)</th>
<th>Thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plain PC Conc Pavement, CL 1 Conc</td>
<td>12 inches</td>
</tr>
<tr>
<td>Recycled Asph Conc 19 MM Superpave, GP 1 or 2, incl Bitum Matl &amp; H Lime</td>
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<tr>
<td>GAB</td>
<td>12 inches</td>
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<tr>
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<td>770 lb/sy</td>
</tr>
<tr>
<td>GAB – 16 inches</td>
<td></td>
</tr>
</tbody>
</table>

Table 11-2: Reserved

11.2.6 Additional Roadway Design Requirements

Supplement the following to Section 11.2.6 of Volume 3:

See Attachment 11-1 for additional roadway design requirements.
11.2.7 Allowable Design Exception(s)/Variance(s)

Supplement the following to Section 11.2.7 of Volume 3:

The following Design Exception(s)/Variance(s)/Deviation(s) are allowable on the Project:

1. The minimum tangent length between broken back curves between curve 16 and curve 6 on DE2 (I-20 WB on-ramp from SB West Martintown Road): The tangent length may be 68 feet to maintain existing I-20 WB on-ramp alignment.

2. The minimum length of horizontal curve at the following locations:
   a. DE1 (I-20) Curve 1 in Georgia: The proposed length of horizontal curve may be 1,147 feet, which is shorter than the minimum length of 1,950 feet, to maintain the existing I-20 centerline alignment.
   b. DE 1 (I-20) Curve 2, EB PGL (I-20 EB) Curve 4 and WB PGL (I-20 WB) Curve 5 in South Carolina: The proposed lengths of horizontal curves may be 1,290 feet, 1,313 feet, and 1,253 feet, respectively, which are shorter than the minimum length of 2,100 feet, to maintain the existing I-20 and I-20 EB and WB centerline alignments.
   c. DE2 (I-20 WB on-ramp from W. Martintown Road) Curve 16 in South Carolina: The proposed length of horizontal curve may be 442 feet, which is shorter than the minimum length of 1,500 feet, to maintain the existing I-20 WB on-ramp centerline.
   d. DE5 (I-20 EB off-ramp to W. Martintown Road) Curve 7 in South Carolina: The proposed length of horizontal curve may be 708 feet, which is shorter than the minimum length of 750 feet, to maintain the existing I-20 EB off-ramp centerline and not shift ramp fill slopes outside of ditch.
   e. DE8 (I-20 WB off-ramp to Georgia Welcome Center) Curve 15 in Georgia: The proposed length of horizontal curve may be 226 feet, which is shorter than the minimum length of 1,650 feet, to maintain the existing I-20 WB off-ramp alignment.

No additional Design Exceptions or Design Variances proposed by the DB Team will be allowed. Any existing conditions within the Project limits that do not meet the requirements of the AASHTO “10 Controlling Criteria”, the GDOT Design Policy Manual, or the SCDOT Roadway Design Manual shall be upgraded to meet the Project requirements.

The DB Team is permitted to retain Design Deviations that are present within the existing conditions. Any existing Design Deviations that are identified within the Project limits and that are intended to be retained in the Project must be presented to GDOT, whether the Design Deviations are located in Georgia or South Carolina.
11.2.8 Visual Quality

No additional requirements.

11.2.9 Permanent Lighting

Supplement the following to Section 11.2.9 of Volume 3:

Lighting structures impacted by construction shall be removed and replaced with new fixtures in the same perpendicular location to the centerline. The lighting bases, poles, and fixtures shall match existing, similar in appearance and dimensions, and utilizing similar materials. The replacement lighting shall be interconnected with the existing lighting.

11.2.10 Related Transportation Facilities

No additional requirements.

11.3 Construction

No additional requirements.
12 DRAINAGE

12.1 General

No additional requirements.

12.1.1 Standards

No additional requirements.

12.2 Administrative Requirements

12.2.1 Data Collection

No additional requirements.

12.2.2 Coordination with Other Agencies

No additional requirements.

12.3 Design Requirements

Supplement the following to Section 12.3 of Volume 3:

Riprap energy dissipators shall be placed at the outlet/downstream end of the stormwater conveyance.

Delete the following in the Drainage Manual Section 2.5.3:

“4. For a bridge crossing a floodplain that is shown on a FIRM map, but does not have a regulatory floodway, the bridge will be sized to limit the backwater to no more than a 1-foot increase in the existing base flood elevation, unless the local community's ordinances are more stringent. In which case, the local regulation shall apply.”

and replace with:

“4. For a bridge crossing a floodplain that is shown on a FIRM map, but does not have a regulatory floodway, the DB Team shall size the bridge to limit water surface increases to no more than 1 foot from the existing base flood elevation, unless the local community’s ordinances are more stringent, in which case, the local regulation shall apply.”

12.3.1 Surface Hydrology

No additional requirements.

12.3.1.1 Design Frequencies

No additional requirements.
12.3.1.2 Hydrologic Analysis

No additional requirements.

12.3.2 Storm Sewer Systems

Supplement the following to Section 12.3.2 of Volume 3

All pipes installed as part of the Project shall be RCP. Where construction impacts existing pipes/culverts or the hydraulic functionality of those pipes/culverts, the structural and hydraulic sufficiency must be demonstrated to GDOT by the EOR for the pipes/culverts to remain in place. Rehabilitation of pipes and box culverts will be allowed as long as hydraulic capacity and structural integrity are achieved.

Type II foundation backfill material is required under all drainage structures.

12.3.2.1 Pipes

Supplement the following to Section 12.3.2.1 of Volume 3

All existing corrugated metal pipe within the construction limits shall be replaced with RCP.

12.3.2.2 Municipal Separate Storm Sewer System (MS4)

Supplement the following to Section 12.3.2.2 of Volume 3

Two Post-Construction Stormwater Reports shall be submitted for review and approval, one report for work in Georgia and one report for work in South Carolina.

12.3.2.3 Gutter Spread/Ponding

Supplement the following to Section 12.3.2.3 of Volume 3

In areas where PEM/OGFC is utilized, ponding shall be confined to the shoulder at the limit of the PEM/OGFC with zero depth at the limit of the PEM/OGFC.

12.3.3 Hydraulic Structures (Culverts/Bridges)

Supplement the following to Section 12.3.3 of Volume 3

For the I-20 over Savannah River Hydraulic Analysis as part of the H&H Study:

- The DB Team shall use FEMA model storm discharges from the FEMA effective HEC-2 model data for determining a No-Rise.
- USGS StreamStats Rural Regression (Ungaged) data taken at I-20 shall be used for the GDOT Hydraulic and Hydrological Study.

For the I-20 over Augusta Canal Hydraulic Analysis as part of the H&H Study:

- The Augusta Canal model shall utilize the peak discharges from USGS Gage 02196500 Augusta Canal at Augusta (Lower). For the 500-year storm, a discharge
of 6,000 cfs shall be used, based on the 1st Level Canal capacity provided by Augusta Public Utilities.

The DB Team shall submit a request to GDOT for a waiver for backwater requirements if the hydraulic study results in backwater in excess of 1.0 ft. A waiver will not be granted for backwater in excess of 1.20 ft.

### 12.3.3.1 Method Used to Estimate Flows
No additional requirements.

### 12.3.3.2 Design Frequency
No additional requirements.

### 12.3.3.3 Hydraulic Analysis
No additional requirements.

### 12.3.3.4 Riverine Bridge/Bridge Culvert Design
No additional requirements.

### 12.3.3.5 Bridge Deck Drainage
No additional requirements.

### 12.3.3.6 Drainage Report for Hydraulic Structures
No additional requirements.

### 12.4 Construction Requirements
No additional requirements.

### 12.5 Deliverables
No additional requirements.
13  STRUCTURES

13.1  General

No additional requirements.

13.1.1  Standards

No additional requirements.

13.2  Design Requirements

13.2.1  Design Parameters

Supplement the following to Section 13.2.1 of Volume 3:

Existing bridges shall be replaced in accordance with the requirements listed in this Section 13.

Table 13-1: Bridge Requirements

<table>
<thead>
<tr>
<th>Bridge</th>
<th>Bridge Location</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bridge 1</td>
<td>I-20 over Augusta Canal</td>
<td>Full replacement requiring new superstructure, substructure, and piers/foundations. The reuse of existing elements is not allowed. New bridge shall accommodate roadway typical section as defined in Section 11. Minimum vertical clearance over tow path shall be 11 feet. No permanent piers shall be located within 35 feet of the Augusta Canal centerline. The minimum span over the Augusta Canal's channel shall be 90 feet, measured perpendicular to the Canal centerline. Bridge end slopes shall be located outside the Augusta Canal and Industrial District National Historic Landmarks. Bents shall be skewed to align with flood flow.</td>
</tr>
<tr>
<td>Structure ID</td>
<td>245-0051-0, 245-0052-0</td>
<td></td>
</tr>
<tr>
<td>Bridge 2</td>
<td>I-20 over Savannah River</td>
<td>Full replacement requiring new superstructure, substructure, and piers/foundations. The reuse of existing elements is not allowed. New bridge shall accommodate roadway typical section as defined in Section 11. Bents shall be skewed to align with flood flow. No more than 13 bents shall be located within the banks of the river.</td>
</tr>
<tr>
<td>Structure ID</td>
<td>245-0053-0, 245-0054-0</td>
<td></td>
</tr>
</tbody>
</table>
Inside and outside bridge shoulders shall match paved roadway shoulders. However, bridge shoulders shall not be less than 12 feet.

The location of the low-point of a vertical curve on a bridge or approach slab shall not be allowed.

Endrolls at bridge abutments shall utilize a maximum 2:1 (H:V) slope normal to the end bent.

Channel banks shall be protected during construction. Placement of piers and/or footings within 15 feet of the western bank of the Augusta Canal will require additional consultation for impacts to the National Historic Landmark.

Final Bridge Plan acceptance shall be contingent on the acceptance of the BFI.

Final Wall Plan acceptance shall be contingent on the acceptance of the WFI.

### 13.2.2 Bridge Decks and Superstructures

Supplement the following to Section 13.2.2 of Volume 3:

Unpainted weathering steel is permitted for use on bridge superstructure with the following conditions:

1. Paint weathering steel superstructure a minimum of one and one-half (1½) times the beam depth away from the centerline (CL) of a joint.

2. Painting scheme shall be aesthetically consistent, i.e., partial painting of beams shall not present to the travelling public a pronounced visual difference when compared with the unpainted portion.

The use of ASTM A709 Grade 50W Steel and Grade HPS 70W Steel is permitted for steel bridge superstructure. Both steel types are considered weathering steel and shall be painted as required by the provisions of these Technical Specifications.

Maximum girder spacing for plate girder bridges shall be ten feet six inches (10'-6").

New steel girders, if they are not weathering steel, shall be a gray finish color. Gray shall be Federal Standard (FS) 595C color number FS36622.

Intermediate diaphragms shall be used on all beams for spans greater than forty feet (40') in length.

The paving rest shall be twelve inches (12") wide.

Pot bearings shall not be used.

Pour strips shall be utilized between construction stages of bridges for all beam types. Use Class AA-1 concrete.
Florida I-Beam (FIB) shapes are allowed. Beams shall be designed in accordance with Florida Department of Transportation (FDOT) Structures Design Guidelines, FDOT Standard Specifications, FDOT FY 2018-19 Standard Plans index numbers 450-010 and 450-036 through 450-096 and FDOT standard practices, unless noted otherwise:

1. Design shall neglect elastic gains.
2. The use of transformed section properties is not allowed.
3. Beams shall be cast with a bearing slot or hole for a dowel bar in accordance with the GDOT Bridge Manual.
4. Temporary strands shall not be used.
5. The Engineer of Record is responsible for providing a beam stability analysis for all span lengths.
6. Maximum beam spacing shall be 10'-6".
7. Diaphragms, edge beams, and endwalls shall be used as specified in the GDOT Bridge Manual.

13.2.3 Bridge/ Retaining Wall Foundations

No additional requirements.

13.2.4 Bridge Railing and Barriers

Supplement the following to Section 13.2.4 of Volume 3:

All new bridge barriers shall be constant slope face type (S-Type) barrier on all new bridges and shall include both sides.

13.2.5 Retaining Walls

Supplement the following to Section 13.2.5 of Volume 3:

MSE walls shall not be used at bridge abutments.

13.2.6 Aesthetics

No additional requirements.

13.2.7 Drainage Structures

No additional requirements.

13.2.8 Sign, Illumination, and Traffic Signal Supports

No additional requirements.

13.2.9 Widening/Modification of Existing Structure

No additional requirements.
13.2.10 Reserved

13.3 Construction Requirements

Supplement the following to Section 13.3 of Volume 3:

Refer to Section 18 for Traffic Control requirements related to bridge construction.

No blasting shall be allowed in the Augusta Canal during construction.

Accelerated bridge construction methods may be utilized to replace existing bridges on the Project. The chosen method(s) is subject to review and acceptance by GDOT to ensure compliance with Project specifications as well as no adverse safety and schedule impacts to the travelling public.

All welding shall be performed by certified welders that have in their possession a current welding certification card issued by the Office of Materials and Testing. The DB Team shall only use E70XX (excluding E7014 and E7024) low hydrogen electrodes for manual shielded metal arc welding.

See Attachment 13-1 for additional Special Provisions.

13.3.1 Concrete Finishes

No additional requirements.

13.3.2 Structure Metals

No additional requirements

13.4 Final Bridge Inspection Prior to Substantial Completion

No additional requirements.

13.5 Deliverables

No additional requirements.
14 RESERVED
15 LANDSCAPE AND HARDSCAPE ENHANCEMENTS

15.1 General Requirements
No additional requirements.

15.2 Administrative Requirements
No additional requirements

15.2.1 Reserved
15.2.2 Reserved
15.2.3 Reserved

15.3 Design Requirements

15.3.1 Reserved

15.3.2 Walls
Supplement the following to Section 15.3.2 of Volume 3:

Where retaining walls (including cast in place walls and MSE walls) are used, the DB Team shall provide ashlar finish.

Ashlar finish shall be achieved with a concrete form liner approved by GDOT. The ashlar pattern stone sizes shall vary from 6 inches to 32 inches wide and 3 inches to 12 inches high with 3/4 inch deep by 3/4 inch wide joints. Ashlar finish shall be light gull gray in color. Light gull gray shall be Federal Standard (FS) 595C color number FS36440 and/or as approved by GDOT.

All visible walls shall have a graffiti-proof coating. Graffiti-proof coating shall meet the requirements of GDOT Standard Specifications Section 838.

15.3.3 Bridges and Other Structures
No additional requirements.
15.3.4 Reserved
15.3.5 Reserved
15.3.6 Reserved
15.3.7 Reserved
15.3.8 Reserved

15.4 Construction Requirements

No additional requirements.
16 SIGNING, PAVEMENT MARKING, SIGNALIZATION

16.1 General
Supplement the following to Section 16.1 of Volume 3:

GDOT will provide to the DB Team, two (2) “Your Dollars Building A Better Georgia Logo” signs either 24” X 36” or 36” X 48”. The signs shall be installed by the DB Team on each end of the Project in Georgia, prior to beginning construction. The signs shall be removed by the DB Team when GDOT issues Substantial Completion on the Project. Upon removal, the signs shall be returned to GDOT.

16.1.1 Standards
No additional requirements.

16.2 Administrative Requirements

16.2.1 Meetings
No additional requirements.

16.3 Design Requirements

16.3.1 Final Plans
No additional requirements.

16.3.2 Permanent Signing and Delineation

A conceptual signing plan is included in Attachment 16-1, which shows the proposed sign locations and sign layouts for all overhead signs as well as all signs mounted on I-beam breakaway posts. The conceptual plan does not show the location of flat sheet signs mounted on u-section posts (mile markers, warning signs, regulatory signs, etc.) along the I-20 mainline; these signs shall be included in the comprehensive signing plan and replaced as part of this Project.

All signing related to the existing left lane ending on I-20 EB shall be removed.

A South Carolina Welcome Center advance guide sign shall be provided approximately 1.25 miles west of exit on I-20 EB.

A Georgia Visitor Information Center advance guide sign shall be required to be placed over the lanes approximately 1 mile east of exit on I-20 WB.

“Right Lane Ends ½ Mile” overhead sign shall be required on cantilever sign support, “Lane Ends 1500 FT” overhead sign on sign bridge structure, and “Lane Ends 500 FT” overhead sign on sign bridge support shall be required on I-20 EB upstream of lane drop.
near Exit 1 in South Carolina. Minimum letter height for legend on these lane reduction signs shall be 12” E(Mod).

Overhead “Georgia Visitor Information Center” exit direction sign with arrow will be required at exit gore on I-20 WB. Welcome to Georgia sign shall be replaced in kind.

Supplemental Guide sign for “Augusta Historic Districts Augusta Canal” shall be required to be replaced. Sign design shall follow Index A-13 in GDOT Signing and Marking Guidelines.

The DB Team shall install truck restriction sign (R554-X) on interstate in locations of three (3) lanes or more of travel in one direction. Signs shall be mounted on overhead sign structure on I-20 WB near exit gore for Georgia Visitor Information Center. Sign shall be designed as per GDOT Detail T-7.

The DB Team shall furnish and install environmentally sensitive area (ESA) signs as indicated in the following table. The DB Team shall submit plans including materials, panel sizes, locations, and other relevant details for review and acceptance by GDOT prior to fabrication and installation of the signs.

<table>
<thead>
<tr>
<th>Sign</th>
<th>Latitude</th>
<th>Longitude</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>33.5333522</td>
<td>-82.00795806</td>
<td>&quot;NO SPRAYING/NO CLEARING YEAR-ROUND&quot;</td>
</tr>
<tr>
<td>2</td>
<td>33.53343345</td>
<td>-82.00939107</td>
<td>&quot;NO SPRAYING/NO CLEARING YEAR-ROUND&quot;</td>
</tr>
<tr>
<td>3</td>
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<td>-82.00785986</td>
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</tr>
<tr>
<td>4</td>
<td>33.5335382</td>
<td>-82.00773445</td>
<td>&quot;NO SPRAYING/NO CLEARING YEAR-ROUND&quot;</td>
</tr>
<tr>
<td>5</td>
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</tr>
<tr>
<td>6</td>
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</tr>
<tr>
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</tr>
<tr>
<td>8</td>
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<td>-81.99777956</td>
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</tr>
<tr>
<td>9</td>
<td>33.53860765</td>
<td>-81.99448851</td>
<td>&quot;NO SPRAYING/NO CLEARING YEAR-ROUND&quot;</td>
</tr>
</tbody>
</table>

The SCDOT Parks Department will furnish and install signs in the vicinity of the SCDOT Welcome Center. The DB Team shall cooperate with the SCDOT Parks Department during the installation of the signs.

**16.3.3 Project Signs – Outside the Existing and Proposed ROW**

*No additional requirements.*

**16.3.4 Reserved**

**16.3.5 Specific Service Signs**

*No additional requirements.*

**16.3.6 Sign Support Structures**

*No additional requirements.*
16.3.7 Permanent Pavement Marking

*Supplement the following to Section 16.3.7 of Volume 3:*

Contrast pavement markings shall be required on all concrete surfaces.

16.3.8 Permanent Signalization

*No additional requirements.*

16.3.8.1 Traffic Signal Requirements

*Supplement the following to Section 16.3.8.1 of Volume 3:*

The DB Team shall be responsible for maintaining all existing traffic signals until Final Acceptance, which includes:

- Control system adjustments.
- Temporary support pole locations required by the Project during the interim period through the installation of the permanent traffic signal location(s).
- Vertical clearance requirements.
- Maintenance, repairs, and upkeep.

At no time shall the DB Team cause any part of the signal(s) to be inoperable. The permanent traffic signal location(s) is to be checked and accepted by the District Traffic Signal Engineer and the County Traffic Engineer prior to Final Acceptance.

16.3.8.2 Traffic Signal Timing Plans

*No additional requirements.*

16.3.8.3 Traffic Signal Permit

*No additional requirements.*

16.3.8.4 Traffic Signal Support Structures

*No additional requirements.*

16.4 Construction Requirements

16.4.1 Permanent Pavement Marking

*No additional requirements.*

16.4.2 Permanent Signing and Delineation

*No additional requirements.*

16.4.3 Permanent Signalization

*No additional requirements.*
17 INTELLIGENT TRANSPORTATION SYSTEMS

17.1 General
This Section 17 addresses the requirements for the GDOT General Purpose Lane Intelligent Transportation System (GDOT ITS) including requirements for traffic surveillance, traveler information dissemination, weather stations, communication, and maintenance during construction.

The improvements, infrastructure, and responsibilities for GDOT ITS are generally described below.

17.1.1 Standards
The DB Team shall provide activities in this Section 17 in accordance with GDOT’s ITS Design Manual, GDOT’s ITS Strategic Deployment Plan (SDP) for the Level I of ITS deployment, Attachment 3-1 Manuals, and other provisions of the DB Documents.

Refer to Attachment 17-1 and Attachment 17-2 for GDOT Special Provisions and Supplemental Specifications, respectively, for installations to be furnished, installed, integrated, and tested.

17.1.2 General Purpose Lane ITS
This work includes, but is not limited to, GDOT ITS, communication network, power, structures, and other required elements within the Right-of-Way required to accommodate the Project. The GDOT ITS includes, but is not limited to, Closed Circuit Television (CCTV) Pan Tilt Zoom (PTZ) cameras, and the communication network including a wireless network.

17.1.3 Reserved

17.1.4 Transportation Management Center (TMC) Improvements
If required, Transportation Management Center (TMC) improvements shall be managed by GDOT and implemented by the Transportation Management Center System Integrator (TMC SI), and referred to as the NaviGAtor Contractor. The Transportation Management Center improvements include NaviGAtor System and software modifications, integration services, and other related improvements as necessary to connect, communicate with, and operate GDOT ITS.

The DB Team is responsible for assuring that all software it incorporates for any aspect of the Project is compatible with software used by GDOT as provided in the Technical Provisions. Prior to using any software or version of software not then in use by GDOT, the DB Team must obtain written acceptance from GDOT. In addition, DB Team shall provide to GDOT, at the DB Team’s cost, any software, licenses and training necessary to assure that GDOT is able to implement compatible usage of all software utilized by The DB Team. Compatible shall mean that the DB Team-provided electronic file(s) may be loaded or imported and manipulated by GDOT using its software with no modifications,
preparation or adjustments. All electronic information submitted to GDOT shall be in native format or, if not available, legible.

The DB Team is responsible for ensuring that the civil infrastructure is in place in accordance with established milestone dates, and for coordination of work as required to allow for the TMC System Integrator (SI) to complete their software development, installation and integration responsibilities with DB Team installed devices.

17.2 Design and Construction Requirements

For GDOT ITS, it is the DB Team’s responsibility to determine the number and specific locations of all ITS components to meet the requirements as outlined in GDOT’s ITS Strategic Deployment Plan (SDP) for the Level I of ITS deployment and the latest ITS Design Manual for design requirements unless specified elsewhere in the DB Contract. The DB Team has flexibility to offer alternatives for GDOT to consider; however, the locations identified on the ITS layout shall include devices and infrastructure to meet the traffic management needs of the Project. The DB Team shall review suggested location modifications with GDOT during the ITS design workshop, to be conducted after roadway geometry is established and through the preliminary design process.

DB Team shall prepare a preliminary and a final GDOT ITS layout including network communication schematic diagrams and specification for review and acceptance by GDOT to ensure adequate planning of the ITS implementation and components’ consistency and compatibilities with adjacent GDOT Projects. The plan shall provide horizontal and vertical plan location, proposed equipment, proposed structures, and types of materials for the entire ITS. The DB Team shall follow the current version of the GDOT ITS Design Manual for its design.

The DB Team shall conduct all work necessary to design, procure, furnish, install, integrate (as defined in this Section 17 and associated specifications), and maintain GDOT ITS on the Project, including gantries, electrical power, fiber-optic communications, ITS cabinets, maintenance access, junction boxes, and conduits, all in accordance with GDOT Standard Specifications, Construction of Transportation Systems and Special Provisions contained herein. Each ITS device, regardless of its purpose, provided by the DB Team shall support, at a minimum, National Transportation Communications for ITS Protocol (NTCIP)-compliant interface protocols so that integration of each device/controller with NaviGAtor is more efficiently supported.

The DB Team shall survey and locate the existing GDOT ITS equipment including all fiber trunk lines, conduit and duct banks, communication hubs, drop fiber and electrical lines, as well as ITS devices and communication devices. As a result of the survey and location of existing GDOT ITS equipment, the DB Team shall identify and notify GDOT of all ITS devices or communications devices needing repair no later than sixty (60) days prior to NTP 3. GDOT will perform or cause to be performed repairs of those necessary ITS devices or communications devices identified as needing repair. The DB Team is responsible for the ITS system and all communication devices within the Project limits upon issuance of NTP 3. The DB Team shall perform preventative maintenance, respond
to problem notifications from GDOT, make any needed repairs or upgrades as necessary, and repair ITS devices or communications damaged by any party during construction.

For each GDOT ITS system, the DB Team is allowed eight (8) hours GDOT ITS downtime to cutover the new GDOT ITS. The DB Team shall notify GDOT no less than two (2) Business Days before proceeding with any GDOT ITS Work. Any downtime outside of the 24 hours may result a non-refundable deduction as listed in the Volume 1, Exhibit 18.

If the Project impacts a Continuous Count Station (CCS) that collects traffic data for GDOT, the DB Team shall notify GDOT at (404) 347-0701 two weeks prior to beginning of construction activities. GDOT will coordinate with the owner of the count station equipment, who will be responsible for salvaging.

17.2.1 Reserved

17.2.2 Reserved

17.2.3 Closed Circuit Television (CCTV) Subsystem

17.2.3.1 CCTV General Requirements

CCTV shall be designed in accordance with the GDOT ITS Design Manual, latest edition.

CCTV shall be furnished, installed, integrated, and tested in accordance with GDOT Standard Specifications, Construction of Transportation Systems.

17.2.3.2 CCTV Applications

GDOT ITS CCTV cameras are used to monitor real-time traffic conditions along the roadway and provide real-time information to support:

1. Incident verification and management.
3. Traffic surveillance and traffic control.

17.2.3.3 CCTV Design Requirements

CCTV cameras shall be designed to be digital IP cameras with digital video streaming capability. The camera shall be designed with on-board H.264 encoding in the camera housing to generate the digital video stream. The camera cables shall include ethernet cable for digital video stream.

Early in the preliminary design schedule, the DB Team shall submit CCTV design for GDOT approval showing that the CCTV design provides overlapping, continuous coverage between adjacent cameras of the General Purpose Lanes, interchange ramps, and ramp intersections with each side street. The evidence may be a 3-dimensional (3D) view of the General Purpose Lanes as viewed from the DB Team’s proposed camera.
mounting heights above the roadway. The 3D views shall cover the entire Project limits and include all possible sight obstructions, including vegetation, existing signs, proposed signs, relocated signs, bridges and overpasses, and vertical and horizontal alignments.

CCTV poles shall be of sufficient height to mount all GDOT cameras at nominally fifty (50) feet above the roadway surface. CCTV cameras and VDS units may be mounted on the same poles. The joint use poles shall be designed to meet the CCTV camera’s mounting height of fifty (50) feet above the roadway. Cameras shall not be mounted in excess of fifty-four (54) feet above the base of the pole or the area where a bucket truck can park for maintenance of the camera. At no times shall the distance between the bucket truck parking location and the camera require a bucket truck arm length of greater than seventy (70) feet.

If CCTV cameras are connected to overhead sign trusses:

1. The maximum fifteen (15) foot tubular extension shall be connected to the sign structure upright and not to any truss portion of the structure.
2. Tubular extensions shall meet the minimum vibration requirements described herein.
3. Perform and submit for approval analysis verifying that the sign structure can accommodate the additional loading in conformance with the DB Documents.

Any pole or upright with a CCTV camera mounted to it shall be designed to be rigid with minimum vibration due to wind. Total deflection at the CCTV mounting height shall meet the requirements set for strain poles for ATMS applications per Standard Specifications, Construction of Transportation Systems Section 639. The DB Team shall include deflection design calculations in the required structure design Submittals.

17.2.3.4 CCTV Detailed Technical Requirements / Specifications

GDOT CCTV technical requirements including Submittals, materials, construction and testing are described in GDOT Standard Specifications, Construction of Transportation Systems Section 936 – Closed Circuit Television (CCTV). CCTV integration is described in GDOT Standard Specifications, Construction of Transportation Systems Section 940 – NaviGAtor Advanced Transportation Management System Integration.

All GDOT CCTV cameras shall be pan-tilt-zoom pressurized dome cameras meeting requirements described in GDOT Standard Specifications, Construction of Transportation Systems Section 936– Closed Circuit Television (CCTV).

17.2.3.5 CCTV Implementation Requirements

For CCTV subsystems that are replacements for removed/relocated CCTV, the DB Team shall furnish, install, integrate, test, and make available for GDOT’s use prior to deactivation and removal of the existing CCTV. All replacement CCTV equipment shall be new. No relocation of existing equipment is permitted as a part of this Project. Replaced and removed devices shall be provided to GDOT.
DB Team shall coordinate return of salvageable equipment with the GDOT State ITS Engineer at (404) 635-2849.

All salvaged equipment shall be placed on pallets, containing a list of materials with the description of each item, their condition, and equipment serial numbers. DB Team shall deliver salvaged equipment to the Traffic Signal Electrical Facility (TSEF) located at 935 East Confederate Avenue, SE, Building 5, Atlanta, GA 30316-2531.

Camera system assemblies shall be installed on new concrete strain poles unless installed on existing or other sign structures.

The DB Team shall prepare and implement a CCTV integration plan for GDOT’s approval. The integration plan shall meet the requirements of *GDOT Standard Specifications, Construction of Transportation Systems Section 940 - NaviGAtor Advanced Transportation Management System Integration*.

17.2.4 Reserved

17.2.5 Reserved

17.2.6 Communications Network

17.2.6.1 Communication Network General Requirements

The DB Team shall design, furnish, install, optimize, integrate and test a wireless system comprised of a radio transceiver, wireless router, antennas, and other components and materials as specified herein for the GDOT ITS devices near the Welcome Center on I-20 West from South Carolina. A wireless communication system is not required in South Carolina.

The wireless system equipment, components, and materials should be consistent and compliant with the latest version or edition of the standards and industry practices as specified. Fiber optic communications are not required.

Wireless communication between the ITS cabinets and the local devices attached to the cabinet shall be designed, furnished and installed by the DB Team based on the requirements of the device or devices. The DB Team to provide and integrated 4G/LTE cellular wireless router only as listed on the GDOT Qualified Products List (QPL) and as approved by the Department’s current cellular telecommunications service provider. No other devices are permitted.

The communication and network layout focuses on the existing and proposed layer Ethernet network for transmission to GDOT. The DB Team shall conduct a wireless system survey for system and get approval before the system is used by the DB Team.

17.2.6.2 Communication Network Design Requirements

The DB Team shall integrate cellular wireless router that is an approved product by the Department's existing cellular telecommunications service provider.
Wireless Communications System shall be furnished, installed, integrated, and tested in accordance with:

GDOT Standard Specifications, Construction of Transportation Systems Section 926 – Wireless Communication System;

1. Section 694 – Weather Monitoring and Reporting System
2. Section 939 – Communication and Electronic Equipment
3. Section 942 – ITS General Requirements
4. Section 940 – NaviGAtor Advanced Transportation Management System Integration

The 4G cellular wireless router will along with having the capability for network traffic to be accessible via a public or private IP connection, via VPN tunnel with SSL, IP Sec, and IP pass-through, the cellular wireless router must comply with the following:

1. Meets IEEE 802.3 standards for 10/100/1000 Mbps Ethernet.
2. Have full support for Secure Sockets Layer (SSL).
3. Supports for Internet Protocol Security (IP Sec) and Virtual Private Network (VPN) functionality.
4. Have a minimum AEC 128-bit (AES-128) encryption capability.
5. Support MAC address filtering and Access Control List.
6. Have a minimum of one 10/100/1000 Base-T/TX, shielded Ethernet-port, outdoor-rated RJ-45 connector or other Ethernet-compatible weathertight connector.
7. Provide visual status indicators including Power, Signal, Ethernet Link, and Activity.
8. Provide wireless router that can operate using 100 to 240 VAC, 50 to 60 Hz or 12/24/48 VDC power.

17.2.6.3 Communication Network Implementation Requirements

The communication network shall be furnished, installed, integrated and tested in accordance with the GDOT Standard Specifications, Construction of Transportation Systems, Special Provisions and Supplemental Special Provisions.

The DB Team will provide evidence of five similar projects completed by the DB Team that consisted of wireless communications installation, testing, and system optimization. The DB Team will also provide evidence that the technical staff who will perform the wireless system work on the project have a minimum of three years of similar experience and are certified by the manufacturer for installation and maintenance of their equipment.

The DB needs three continuous years of wireless communications services with conducting radio installation studies consisting the following:
1. Signal noise studies
2. Spectrum analysis
3. Antenna gain/radio power calculations
4. System attenuation
5. Measurement of standing wave ratios
6. Installation and optimization of broadband radio systems consisting of:
   7. Equipment installation
   8. Configuration of radios
   9. Antenna calibration
   10. Cabling

The DB Team shall furnish and install all equipment, cabinets, cabling, and electronic devices needed to connect the ITS devices to the Layer 2 and Layer 3 Ethernet switches and to connect all GDOT ITS devices to the Layer 2 switch in the local ITS cabinet.

### 17.2.7 Weather Monitoring and Reporting System

The existing weather monitoring and reporting system shall be removed and replaced by the DB Team. The DB Team shall design, furnish, install, integrate a weather monitoring and reporting system for the GDOT ITS near the GDOT Visitor Information Center on I-20 West from South Carolina. The DB Team shall propose a location for the weather station for GDOT review and approval.

All weather monitoring and reporting system shall be designed in accordance with the latest GDOT ITS Design Manual.

Weather monitoring and reporting system shall be furnished, installed, integrated, and tested in accordance with:

1. GDOT Standard Specifications, Construction of Transportation Systems Section 649 – Weather Monitoring and Reporting System
2. Section 942 – ITS General Requirements
3. Section 940 – NaviGAtor Advanced Transportation Management System Integration

### 17.2.7.1 Weather Monitoring and Reporting System Design Requirements

Weather Monitoring and Reporting System shall be designed to collect, store and transmit atmospheric, pavement condition and subsurface data. The sensors which are installed along the roadway or on bridges should be able to detect the following data, such as:

1. Air temperature
2. Relative humidity data
3. Ultrasonic Wind data
4. Barometric pressure data
5. Precipitation data
6. Visibility data

Pavement sensors shall be located in, above or under the pavement and provide data for pavement condition data and surface condition data. Subsurface sensor will be located in the first travel lane or paved shoulder as approved by GDOT.

### 17.2.7.2 Weather Monitoring and Reporting System Detailed Technical Requirements / Specifications

GDOT Weather Monitoring and Reporting System requirements including Submittals, materials, construction and testing are described in GDOT Standard Specifications, Construction of Transportation Systems Section 649—Weather Monitoring and Reporting System. Weather Monitoring and Reporting System integration is described in GDOT Standard Specifications, Construction of Transportation Systems Section 940 – NaviGAtor Advanced Transportation Management System Integration.

### 17.2.7.3 Weather Monitoring and Reporting System Implementation Requirements

The DB Team shall furnish, install, integrate, and test Weather Monitoring and Reporting System. The DB Team will demonstrate the proposed ESS prior to deployment in regards to providing interoperability and connectivity with the existing statewide ESS system. All ESS sensors, RPUs, associated ESS field cabinets, and equipment at the locations specified in the Contract documents will be installed per ESS manufacturer recommendations. The DB Team will install all sensors, a controller and cabinet, electrical cabling, and pull boxes. The DB Team shall provide communication to the Weather Monitoring and Reporting System as it is needed for system coordination.

### 17.2.8 ITS Electrical Service (Power) Requirements ITS Electrical General Requirements

The DB Team shall coordinate with the electrical power companies and provide electrical power for all ITS included in the Project.

### 17.2.9 Electrical Design Requirements

#### 17.2.9.1 General Electrical Design Requirements

The DB Team shall ensure electrical power is designed based on the electrical service loads at each location where power is required. Electrical service, wire sizes, transformers, surge suppression, meters, grounding, lightning protection and uninterruptable power supply (UPS) are all considered part of the electrical power systems.

At locations where electrical power service is provided to GDOT, the DB Team shall ensure that the electrical power company installs electrical usage meters for GDOT equipment.
The DB Team shall design electrical loads for all ITS cabinets, hub buildings, and GDOT ITS devices.

The DB Team shall provide electrical power calculations to GDOT for review and approval during the design. Power calculations shall include power loading, transformers, and conductor sizes based on National Electrical Code (NEC) standards. In no case shall electrical service provided at a location be less than 120 volt, 20 amps AC. Electrical load at each ITS shall be based on a factor of two (2) times the calculated load based on the equipment being provided for that cabinet to allow for future expansion and use of maintenance tools.

In addition to other requirements referenced herein, electric pull boxes shall be spaced not more than five-hundred (500) feet apart. No fiber optic or other data communication or composite cable shall be installed in the same conduit or pull box as electrical power service cable.

The DB Team shall install mechanical theft deterrent devices in all Project electrical conduits and electrical pull boxes to prevent the removal of electrical wiring and to prevent unauthorized access. The theft deterrent devices shall be rubber stopper mechanical devices that compress against the electrical wiring and prevent the wires from being easily pulled through the conduits, or alternate as acceptable to GDOT. DB Team shall also install electrical pull box lids that contain locking mechanisms that works with the use of cams to prevent unauthorized access.

Voltage design drop calculations shall comply with the suggested limits defined in NEC Article 210.19 (A) (1) Informational Note 4 and NEC Article 215.2 (A)(b) Informational Note 2. These calculations shall define all service points, circuits emanating from those points, details of all loads on all circuits, the nominal voltage on each circuit, the voltage drop for each link of each circuit, the percent voltage drop for each circuit and the wire size selected for each link of each circuit. These calculations shall include sizing and ratings of all circuit breakers, transformers, fused switches and transfer switches planned for installation. These calculations shall be submitted with the preliminary and final design Submittals and with subsequent Submittals with all data appropriately updated. An allowance of 9.0 Amps shall be included at the end of the circuit for a convenience outlet. Where transformers are used, they shall be provided with ± 2.5% and ± 5% voltage taps. These taps shall not be used to fulfill the voltage drop and wire size requirements of these minimum technical requirements.

The circuits from a power service point shall be separate circuits (running either both north and south or east and west), each with its individual circuit breaker provided. A main disconnect circuit breaker shall be provided at each power service point.

### 17.2.9.2 Lightning Protection Design Requirements

All CCTV, CMS, and MDS poles (including sign structures with ITS) shall be designed to include lightning protection systems per the requirements of Attachment 17-4: Surge Protection Systems and Devices and as described herein. The top of the lightning rod shall be at least two (2) feet above the highest point or top of any and all ITS devices.
attached near the top of the pole, and shall be mounted within a sixty (60) degree cone of protection measured from the top of the lightning rod or the one that provides the most protection for the ITS device.

Each ITS cabinet, ITS pole and hub building shall have an exterior earth-ground ring consisting of a system of ground rods connected to a ring of a #2 AWG, stranded bare copper ground wire. For ITS cabinets and ITS poles, the earth ring shall include of a minimum of two ground rods. Ground rods shall be placed at least forty (40) feet from adjacent ground rods. When ground rods adjacent installations are within one hundred (100) feet of each other, the rings shall be connected with #2 AWG stranded bare copper ground wire. Each site shall include lightning protection that shall also be connected to the site’s earth-ground ring. The ground system shall be measured and documented with a resistance of five (5) ohms or less.

When new GDOT ITS devices are placed on an existing structure, the structure’s lightning protection system shall be updated by the DB Team to the lightning protection requirements for new structures.

17.2.9.3 Grounding Design Requirements

In order to facilitate testing and periodic retesting of the grounding array at each ITS pole, ITS cabinet and hub building, etc., the DB Team shall design the grounding system so that the top of all ground rods is installed in an electrical service Type 2 pull box. The grounding conductor shall be designed to be exothermically connected to the ground rod at an elevation of twelve (12) inches below ground line. All ITS equipment and enclosures located at a communication hub site shall conform to the latest adopted NEC for bonding and grounding. Grounding arrays shall be designed to be interconnected for cabinets, poles, lightning systems, etc., that are within forty (40) feet of each other. The actual locations of buried connections and ground rods shall be accurately shown in the Record Drawings.

When new GDOT devices are placed on an existing structure, the grounding system shall be updated by the DB Team to current specifications.

Grounding shall meet the minimum requirements of NEC.

17.2.9.4 Uninterruptable Power Supply (UPS) Design Requirements

For GDOT ITS locations, the DB Team shall design uninterruptable power supply (UPS) to meet the requirements in GDOT ITS Design Manual, GDOT Standard Specifications, Construction of Transportation Systems Section 939 and the following:

- UPS shall be designed to support GDOT equipment in all new hub buildings.
- The DB Team shall designate space within the hub buildings for the installation of the GDOT UPS.
17.2.9.5 Electrical Implementation Requirements

The DB Team shall furnish, install and test the electrical systems as required to meet the power and UPS demand of each communication hub location and GDOT ITS cabinet location. The DB Team shall furnish and install and test the electrical services as required by GDOT Specification 682, the approved Plans, and herein.

At locations (except hub buildings) where electrical power service is provided to GDOT ITS cabinets and devices, the DB Team shall ensure that the electrical power company installs an electrical usage meters for GDOT equipment. At each new hub building, the DB Team shall ensure that the electrical power company installs one (1) electrical usage meter for the hub building.

The DB Team shall ensure all voltage being provided to the cabinet is in accordance with the DB Team’s approved electrical design calculations. The DB Team shall test the power from the electrical service disconnect, to the transformer, to the meter(s) and into the cabinets.

For GDOT ITS, the DB Team shall furnish and install all components of the electrical power systems to ensure complete and functioning systems, from equipment cabinets to and including devices. The electrical systems shall be furnished and installed to include all required device power supplies, grounding, lightning protection and surge suppression. Surge suppression shall be furnished and installed on both ends of any underground electrical cable or composite cable carrying electrical power to an device to protect against surges induced from a lightning strike on the ground.

Electrical service shall be installed and ready for connection before ITS cabinets and CMS are installed. Electrical services shall be connected and activated for all ITS cabinets, hub buildings, and CMS within twenty-four (24) hours of installation of the cabinet or CMS.

17.3 Testing and Acceptance

The DB Team shall submit test plans to GDOT for review and acceptance for the various components of the ITS including VDS, CCTV, CMS, communications network, weather stations, and electrical service.

DB Team testing of specific ITS technologies, electrical components, communication network and infrastructure, communication hubs and equipment cabinets shall follow the test requirements sections in the GDOT Standard Specifications, Construction of Transportation Systems/Special Provisions.

GDOT ITS, communication hub and communication network testing and final acceptance processes are to be conducted according to the applicable GDOT Standard Specifications, Construction of Transportation Systems, Special Provisions, and as described herein.

The DB Team shall submit operational test results for each unit or system to GDOT for approval. The test results shall indicate that the unit or system conforms to the
manufacturer’s specifications and the Contract Documents. The DB Team shall adjust, relocate, or modify items that do not conform to the manufacturer’s specifications and the Contract Documents as necessary in order to meet the requirements. Submit new test results after corrections have been made that bring the units or systems into conformity.

17.4 Warranty

The DB Team shall provide all warranties as set forth in the DBA and specified in the Standard Specifications, Construction of Transportation Systems, Special Provisions and contained herein. In the event of conflicting warranty periods between the above, the longest warranty period identified shall be provided by the DB Team. All warranties shall commence upon Final Acceptance. Any additional costs incurred by the DB Team to meet the warranty requirements shall be the sole responsibility of the DB Team.

17.4.1 Protection of Existing ITS Signalization

The DB Team shall ensure the existing GDOT ITS are protected from damage. Damage caused by the DB Team to GDOT ITS, due to failure to locate any existing or installed GDOT ITS within the Project limits, shall be the responsibility of the DB Team. GDOT (or their respective maintenance contractors) will repair or replace the damaged ITS field element or infrastructure; the DB Team shall be responsible for the total repair or replacement cost along with all non-refundable deductions per Volume 1, Exhibit 18.

If necessary, any disruption to the existing GDOT ITS shall be planned and coordinated with GDOT, no less than two (2) Business Days before proceeding with the Work.

17.4.1.1 Existing System Inventory

The DB Team shall conduct a field survey and provide a complete inventory of all ITS components and infrastructure in the Project limits within thirty (30) Days of NTP 1. The inventory shall include components and infrastructure to be removed and replaced, to be removed and relocated, and to be left in place.

17.4.1.2 ITS Locates

The DB Team shall locate the electrical and fiber optic conduits and cables within the construction limits. The DB Team shall obtain available ITS as-built and location information from GDOT upon NTP 3 and shall be fully responsible for locating all existing, temporary and new ITS infrastructure and facilities until Final Acceptance. The DB Team shall be responsible for providing ITS locates requested by other consultants, contractors and/or utility companies within forty-eight (48) hours of receiving requests from GDOT or from any other source from NTP 3 to Final Acceptance. The DB Team shall notify GDOT of the date and location of each locate request and the date at which the locate was completed.

The DB Team shall fully cooperate with all Utility Owners during the design, survey and construction activities of the Project. The DB Team shall call Georgia 811 a minimum of forty-eight (48) hours and a maximum of ninety-six (96) hours before any excavation work.
17.4.1.3 ITS Preventative Maintenance

GDOT (and their respective maintenance contractors) will continue to provide routine and on-call maintenance for all ITS equipment within the Project area during the Term. The DB Team shall cooperate with GDOT by accommodating access to the site for GDOT’s maintenance contractor to perform routine or on-call maintenance.

17.4.1.4 ITS Repair and Replacement

Throughout the construction period until the Final Acceptance of the Project, the DB Team shall notify GDOT of any damage to the existing ITS field element or infrastructure that is caused by the DB Team, either due to the negligence or direct action of the DB Team as soon as possible. GDOT (or their respective maintenance contractors) will repair or replace the damaged ITS field element or infrastructure; the DB Team shall be responsible for the total repair or replacement cost along with all non-refundable deductions per Volume 1, Exhibit 18.

If an existing ITS element or infrastructure needs to be taken out of service due to construction related relocation or interruption or as required by the Project specifications, the DB Team shall provide GDOT a written notice seventy-two (72) hours in advance before taking control of the device(s). Any impacted devices shall be replaced with an equivalent in new condition or per the Project specifications. All replacement devices are subject to the testing and acceptance requirements specified in the Project specifications.
18  TRAFFIC CONTROL

18.1 General
No additional requirements.

18.1.1 Standards
No additional requirements.

18.2 Administrative Requirements

18.2.1 Transportation Management Plan
Supplement the following to Section 18.2.1 of Volume 3:

A detailed plan for all Project detours, including a narrative of all detour activities, detour schedules and timelines, and detour maps, shall be developed by the DB Team and included within the Transportation Management Plan (TMP). The DB Team shall include descriptions of their approach for communicating this information to the traveling public.

18.2.2 Worksite Traffic Control Supervisor (WTCS)
No additional requirements.

18.3 Design Requirements

18.3.1 Traffic Control Plans
Supplement the following to Section 18.3.1 of Volume 3:

The DB Team shall provide a minimum of four (4) changeable message signs for use as needed. The DB Team shall be required to place and maintain messages on all message boards 24 hours a day, 7 days a week as directed by GDOT. The changeable message signs shall meet all requirements of Standard Specification Section 632 Changeable Message Sign, Portable Type 3. Failure to respond to the direction of GDOT within 45 minutes shall result in the assessment of non-refundable deductions.

18.3.1.1 Roadway Guidelines
No additional requirements.

18.3.1.1.1 Design Parameters for Traffic Control
No additional requirements.

18.3.1.2 Allowable Shoulder/Lane/Roadway Closures and Traffic Stage Changes
Delete the holiday restrictions table in Section 18.3.1.1.2 of Volume 3 and replace with the following:

<table>
<thead>
<tr>
<th></th>
<th>Restriction Begins</th>
<th>Restriction Ends</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Easter (Thursday through Monday)</td>
<td>Thursday at 6:00 am</td>
</tr>
<tr>
<td>2.</td>
<td>Memorial Day Weekend (Friday through Monday)</td>
<td>Friday at 6:00 am</td>
</tr>
<tr>
<td>3.</td>
<td>Independence Day</td>
<td>July 2 at 6:00 am</td>
</tr>
<tr>
<td>4.</td>
<td>Labor Day Weekend (Friday through Monday)</td>
<td>Friday at 6:00 am</td>
</tr>
<tr>
<td>5.</td>
<td>Thanksgiving Holiday (Wednesday through Monday)</td>
<td>Wednesday at 6:00 am</td>
</tr>
<tr>
<td>6.</td>
<td>Christmas/New Year Holiday</td>
<td>December 23 at 6:00 am</td>
</tr>
<tr>
<td>7.</td>
<td>Georgia Tax Free Weekend/Sales Tax Holiday (typically Saturday and Sunday, late July and late September)</td>
<td>Friday at 6:00 am</td>
</tr>
<tr>
<td>8.</td>
<td>Spring Break (traditionally the 2nd or 3rd week of March, but may vary) (Friday before, Saturday through Sunday, Monday)</td>
<td>Friday at 6:00 am</td>
</tr>
<tr>
<td>9.</td>
<td>Masters Golf Tournament</td>
<td>(See requirements below)</td>
</tr>
</tbody>
</table>

Supplement the “Lane and Shoulder Closure During Design-Build Period” subsection of Section 18.3.1.1.2 of Volume 3 with the following:

**Lane Closures**

Closure of a General Purpose Lane or auxiliary lane at any time shall be considered a Single Lane Closure. See Exhibit 18 regarding liquidated damages and nonrefundable deductions.

1. The DB Team shall not completely close I-20 in either direction.
2. The DB Team shall maintain 4 lanes of travel (2 in each direction) on I-20 at all times, unless otherwise stated in this Section 18.
3. The DB Team shall not install lane closures, pace traffic or move equipment or materials that interferes with traffic on I-20 in the Eastbound direction between the hours:
   a. Monday and Tuesday 7:00 a.m. to 9:00 p.m.
   b. Wednesday and Thursday 7:00 a.m. to 10:00 p.m.
   c. Friday 7:00 a.m. to 10:00 p.m.
   d. Saturday 8:00 a.m. to 10:00 p.m.
   e. Sunday 9:00 a.m. to 9:00 p.m.
(4) The DB Team shall not install lane closures, pace traffic or move equipment or materials that interferes with traffic on I-20 in the Westbound direction between the hours:
   a. Monday through Wednesday 6:00 a.m. to 8:00 p.m.
   b. Thursday 6:00 a.m. to 9:00 p.m.
   c. Friday 6:00 a.m. to 10:00 p.m.
   d. Saturday 8:00 a.m. to 8:00 p.m.
   e. Sunday 10:00 a.m. to 9:00 p.m.

(5) No closures of ramps are allowed at any time. At a minimum, the DB Team shall provide written notification to the Augusta Canal Authority, Chairman of the Richmond (Georgia) County Commissioners, SCDOT Director of Traffic Engineering, SCDOT District 7 District Engineering Administrator, Augusta (GA) Police Department, Richmond County Sheriff’s Office County Emergency Medical Services, Richmond County Board of Education, North Augusta (SC) Department of Public Safety, Aiken County (SC) Sheriff’s Office, and Aiken County Police Department at least two (2) weeks prior to any closure or detouring of traffic.

(6) Inside shoulders constructed as part of this Project may be used as General Purpose lanes during construction and shall maintain the restrictive work hours in this Section for single lane closures. Long term roadway shoulder closures will be allowed on one shoulder with GDOT’s approval in areas where there is an inside and outside shoulder. The shoulder opposite of the closed shoulder shall have a minimum paved, usable width of eight (8) feet. Shoulder closure will be allowed for a maximum of one hundred and eighty (180) days and a maximum distance of one (1) mile. There should be at least one (1) mile between long term shoulder closures. Long term shoulder closure is defined as any shoulder closures longer than three days. Long term bridge shoulder closures may be allowed on both shoulders with GDOT’s approval.

(7) Access to the South Carolina and Georgia Welcome Centers shall be maintained at all times.

(8) In an event where the Governor of Georgia, Governor of South Carolina, Georgia Department of Public Safety, or South Carolina Department of Public Safety has issued a state of emergency and the evacuation must occur, the DB Team will release the Project to the State of Georgia and/or State of South Carolina until the state of emergency has been lifted. The DB Team shall:
   a. Remove all equipment from the clear zone,
   b. Remove all lane and road closures,
   c. Remove all associated traffic control equipment unless necessary for maintaining an existing traffic condition, and
   d. Evacuate the Project within four (4) hours of the state of emergency issuance.
District 2 Masters Golf Tournament Shutdown

No lane closures are allowed beginning the Friday before the Masters Golf Tournament, which is scheduled to begin the Monday of the first full week in April, and extending through the Monday after the Masters Golf Tournament. Should the Masters Golf Tournament extend beyond the original schedule, the DB Team shall maintain the restrictive work hours in this Section 18 for lane closures until the day following the last scheduled day of the tournament. The DB Team shall verify the Masters Golf Tournament schedule and plan the Work accordingly.

18.4 Construction Requirements

No additional requirements.

18.4.1 DB Team Responsibility

Supplement the following to Section 18.4.1 of Volume 3:

All milled surfaces shall be covered before they are opened to traffic.

Payment for workzone law enforcement shall be covered under the Construction Complete.

18.4.2 Access

No additional requirements.

18.4.3 Detours

Supplement the following to Section 18.4.3 of Volume 3:

Detours are not allowed on the Project.
19 MAINTENANCE DURING THE DESIGN-BUILD PERIOD

No additional requirements.

19.1 General

19.1.1 Standards

No additional requirements.

19.1.2 Reserved

No additional requirements.

19.1.3 GDOT Obligation to Repair

No additional requirements.

19.2 Construction Maintenance Limits Plan

Supplement the following to Section 19.2 of Volume 3:

For avoidance of doubt, DB Team maintenance responsibilities also include maintaining pavement markings including striping.

Maintenance shall constitute continuous and effective work prosecuted day by day or at the direction of GDOT.

DB Team shall restore any local roads utilized for hauling, staging or other construction-related activity to their original condition, whether within or outside of the Project limits. The repair shall be made within a reasonable period of time as determined by GDOT. Multiple repairs may be required if the damage occurs more than once or after an initial repair. All repairs must be in satisfactory condition as determined by GDOT prior to Final Acceptance.

19.3 Maintenance Management Plan

No additional requirements.
20 BICYCLE AND PEDESTRIAN FACILITIES

20.1 General
No additional requirements.

20.1.1 Standards
No additional requirements.

20.2 Design Requirements

20.2.1 Bicycle Facilities
No additional requirements.

20.2.2 Pedestrian Facilities
No additional requirements.

20.2.3 Final Plans
No additional requirements.
21 RESERVED
22  RESERVED
Georgia Department of Transportation

Technical Provisions

For

Design-Build Agreement

GDOT P.I. No. 210327-

Attachment 1-1

SCDOT Technical Provisions
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</tr>
</thead>
<tbody>
<tr>
<td>Exhibit 1-1B</td>
<td>SCDOT Supplemental Specifications and Special Provisions</td>
</tr>
</tbody>
</table>
1 GENERAL

1.1 Project Design

All reviews, approvals, or acceptances by GDOT included in this Attachment 1-1 shall be provided by GDOT only after review and concurrence by SCDOT.

1.2 Design References

Design standards shall be in accordance with the following design references as supplemented or amended by this Attachment 1-1. Any variation in design from the included information shall require written approval from GDOT.

The DB Team shall prepare the design for the Project using the design standards and criteria that are most appropriate with proper consideration given to the design traffic volumes, adjacent land use, design consistency, aesthetics, ADA requirements, and this document.

The design developed by the DB Team shall be an engineering solution that is not merely an adherence to the minimum AASHTO and/or Department standards.

- AASHTO Highway Drainage Guidelines, 2007
- AASHTO An Informational Guide On Fencing Controlled Access Highways, 1990
- FEMA Regulations, 44CFR Chapter 1
- SCDHEC NPDES Construction Permit # SCR160000
- SCDHEC NPDES MS4 Permit # SCS040001
- SCDOT Access and Roadside Management Standards, August 2008 with updates
- SCDOT Americans with Disabilities Act Transition Plan, December 2014 with updates
- SCDOT Bridge Design Manual, 2006
- SCDOT Bridge Design Memoranda, effective between July 1, 2006 and the Final RFP release date
• SCDOT Bridge Drawings and Details, effective as of the Final RFP release date
• SCDOT Engineering Directives, effective as of the Final RFP release date
• SCDOT Geotechnical Design Manual, 2010 Edition (Version 1.1)
• SCDOT Geotechnical Drawings and Details, effective as of the Final RFP release date
• SCDOT Roadway Design Manual (RDM), 2017, with updates effective as of the Final RFP release date and supplemented with AASHTO A Policy on Geometric Design of Highways and Streets, 2011
• SCDOT Instructional Bulletins, effective as of the Final RFP release date
• SCDOT Pavement Design Guidelines, July 2008 Edition
• SCDOT Preconstruction Advisory Memorandums, effective as of the Final RFP release date
• SCDOT Preconstruction Design Memorandum, effective as of the Final RFP release date
• SCDOT Preconstruction Survey Manual, effective as of the Final RFP release date
• SCDOT Procedures and Guidelines for Work Zone Traffic Control Design, effective as of the Final RFP release date
• SCDOT Qualified Product Listings, effective as of the Final RFP release date
• SCDOT Requirements for Hydraulic Design Studies, May 2009
• SCDOT Road Design Reference Material for Consultant Prepared Plans, June 2010
• SCDOT Roadside Plants to Avoid/Trees with Limitations on R/W, October 2014
• SCDOT Seismic Design Specifications for Highway Bridges, 2008 (Version 2.0)
• SCDOT Standard Drawings, effective as of the Final RFP release date
• SCDOT Standard Specifications for Highway Construction, 2007
• SCDOT Stormwater Quality Design Manual, effective as of the Final RFP release date;
• SCDOT Supplement to the MUTCD
• SCDOT Supplemental Specifications (2007), effective as of the Final RFP release date
• SCDOT Supplemental Technical Specifications, effective as of the Final RFP release date
• SCDOT Traffic Signal Design Guidelines, 2009 with updates
• SCDOT Traffic Signal Material Specifications, effective as of the Final RFP release date
• SCDOT Traffic Signal Supplemental Specifications, effective as of the Final RFP release date
• SCDOT Street Trees and Sidewalk Planting Suggestions, May 2013
• SCDOT Vegetation Management Guidelines, effective as of the Final RFP release date
• SCDOT Roadway CADD Manual, effective as of the Final RFP release date
• South Carolina State Water Law
• The Rule on Work Zone Safety and Mobility, Policy and Guidelines

2  PROJECT MANAGEMENT

No additional requirements.

3  DESIGN AND SUBMITTALS

No additional requirements.

4  ENVIRONMENTAL

Obtain necessary permits for work in navigable waters. A permit issued by the South Carolina Department of Health and Environmental Control (SCDHEC) is required for any dredging, filling or construction or alteration activity in, on, or over a navigable water, or in, or on the bed under navigable waters, or in, or on lands or waters subject to a public navigational servitude under Article 14 Section 4 of the South Carolina Constitution and 49-1-10 of the 1976 S.C. Code of Laws including submerged lands under the navigable waters of the state, or for any activity significantly affecting the flow of any navigable water.

<table>
<thead>
<tr>
<th>Permit Required</th>
<th>Agency Review and Issuance Time Period (Calendar Days)</th>
<th>Listed Applicant</th>
<th>Preparer of Application</th>
</tr>
</thead>
</table>
| SCDHEC Navigable Permit         | 140                                                    | SCDOT             | DB Team                 

Note: Review of the SCDHEC Navigable Permit will be concurrent with the USACE review of Section 404 General Permit.

5  RIGHT OF WAY (ROW) – DB TEAM ACQUISITIONS

No additional requirements.

6  UTILITY ADJUSTMENTS

No additional requirements.
7 RIGHT OF WAY (ROW) – ADDITIONAL PROPERTIES

No additional requirements.

8 GEOTECHNICAL

8.1 General

The following items, at a minimum, shall be included in the geotechnical design for this project:

- Design roadway embankments and foundations for proposed retaining wall and all other roadway structures. All subsurface exploration, geotechnical design, and construction for the Project shall be carried out in accordance with the design criteria below and design references identified in Volume 2, Attachment 1-1, Section 1.2.

8.2 Criteria

8.2.1 Roadway

Design all roadway embankments and new roadway structures required for the Project in accordance with the SCDOT Geotechnical Design Manual (GDM), 2010, Version 1.1. The DB Team shall obtain GDOT approval prior to using reinforced soil slopes (RSS). The DB Team shall obtain GDOT approval prior to using fill slopes or ditch slopes steeper than 2H:1V.

Bridge embankments within South Carolina shall be designed in accordance with GDOT standards.

Miscellaneous overhead structure foundations such as lighting and signage shall be designed in accordance with AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, effective as of the Final RFP release date.

8.2.2 Seismic

Seismic design of roadway structures shall be required in accordance with the SCDOT Geotechnical Design Manual and SCDOT Seismic Design Specifications for Highway Bridges.

Roadway embankments Operational Classification is ROC IV. Operational Classification for structures located within bridge embankment limits is ROC I. Operational Classification for structures located outside bridge embankment limits is ROC III. Operational Classification for rigid walls with
heights greater than 15 feet and flexible walls with heights greater than 50 feet is ROC I.

Three-Point Acceleration Design Response Spectrum (ADRS) curves have been generated for the I-20 corridor. The ADRS curves are provided below for both seismic Site Class C and seismic Site Class D subsurface conditions. The appropriate ADRS curve shall be used in the design of each roadway structure on the project.

### Site Class C

<table>
<thead>
<tr>
<th>Design EQ</th>
<th>PGA</th>
<th>S&lt;sub&gt;DS&lt;/sub&gt;</th>
<th>S&lt;sub&gt;D1&lt;/sub&gt;</th>
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<tbody>
<tr>
<td>FEE</td>
<td>0.09</td>
<td>0.17</td>
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<tr>
<td>SEE</td>
<td>0.25</td>
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### Site Class D

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<th>PGA</th>
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<th>S&lt;sub&gt;D1&lt;/sub&gt;</th>
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<td>0.23</td>
<td>0.08</td>
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<tr>
<td>SEE</td>
<td>0.29</td>
<td>0.54</td>
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</table>
SC Seismic Hazard Map Three-Point ADRS Curve From Ground Surface - Site Class C
SC Seismic Hazard Map Three-Point ADRS Curve From Ground Surface - Site Class D

<table>
<thead>
<tr>
<th>Period, T [sec]</th>
<th>Spectral Response Acceleration, Sa (g)</th>
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<tbody>
<tr>
<td>0.00</td>
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See ADRS Curve

FEE ADRS Curve

Three-Point Method

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Georgia Department of Transportation
P.I. No. 210327- - I-20 at Savannah River Design-Build Project

October 19, 2018

Technical Provisions - Volume 2

Attachment 1-1
9  SURVEYING AND MAPPING

No additional requirements.

10  GRADING

No additional requirements.

11  ROADWAYS

11.1  Project Design

The design elements shall include, but not be limited to, the horizontal and vertical alignments, lane widths, shoulder widths, median widths, sight distance, clear zone, cross slopes, and side slopes.

Refer to Exhibit 1-1A (Supplemental Project Design Criteria).

11.2  Project Scope

11.2.1  Functional Classification

Classify the terrain as rolling on all routes.

The functional classification for specific roadways is as follows:

Interchange Cross-Over Roads

SC 230 (W. Martintown Road): Urban Arterial

11.2.2  Design Speed

Interchange Ramps

Ramps: 45 mph

Interchange Cross-over Roads

SC 230 (W. Martintown Road): 45 mph

11.2.3  Traffic Lane, Shoulder & Median Criteria

Develop traffic lane, shoulder, and median widths in compliance with SCDOT Roadway Design Manual.
SC 230 (W. Martintown Road)

Through Lanes: Match Existing
Shoulder (outside): Match Existing
Median (TWTL): Match Existing

If the inside shoulder width needs to be widened due to the bridge pier, overhead sign support, or horizontal sight distance on I-20 then use horizontal curves to develop the transitions based on an 80 mph design speed. Horizontal sight distance shall be based on 70 mph design speed.

In all locations where the median width is 36 feet or less, pave the area between the edge of the inside paved shoulder to the face of the median barrier with a minimum 8 inches of Hot Mixed Asphalt. Place no less than 8 inches of dense graded HMA, including 200 pounds per square yard (psy) Surface Type C as a wearing course.

An outside I-20 EB travel lane drop is required. The I-20 EB travel lane drop shall begin at the proposed painted gore nose at the EB off-ramp to the first interchange (Exit 1, West Martintown Road) in South Carolina (Aiken County), and shall include a full travel lane width extending 500 linear feet beyond the proposed painted gore nose, and a taper extending an additional 720 linear feet. The total length required for the lane drop development shall be 1220 linear feet as described herein. Maintain the full three (3) travel lane width, shoulder pavement width, and the pavement typical section set forth in Volume 2, Attachment 1-1 for the entire lane drop to accommodate a future widening project; and use pavement markings to develop the taper.

11.2.4 Horizontal Curves

Develop horizontal curves and superelevation in compliance with SCDOT Roadway Design Manual and the SCDOT Standard Drawing.

For horizontal sight distance, use grade adjusted SSD values where the downgrades are 3 percent or greater on I-20.

If modifications to ramps result in tie-ins to existing roads at the begin/end of construction then match existing conditions.

11.2.5 Vertical Curves, Grades, and Clearances

Do not use spline grades. Spline grades are only acceptable on the ramps within the limits of the gore areas.

If the existing vertical clearance at overpass bridges on I-20 is less than 16 feet then retain or improve the existing vertical clearance during construction phases. Final vertical clearances shall be as specified in the SCDOT RDM.

Use grade adjusted K values where the downgrades are 3 percent or greater on I-20.

11.2.6 **Side Slopes**


Any fill slope steeper than 2:1 shall require GDOT approval.

11.2.7 **Cross Slopes**


11.2.8 **Clear Zones**

Use the SCDOT Roadway Design Manual and the AASHTO Roadside Design Guide, 2011, 4th Edition. When a range of values is shown, select higher value. See the AASHTO Roadside Design Guide, 2011, 4th Edition for clear zone calculations where a 3H:1V fill slope is used. Use 3H:1V fill slopes only where fill heights are required to match existing conditions and clear zone can be obtained within the Project limits.

For those areas where no guardrail currently exists, design fill and cut slopes to obtain clear zones and to avoid the need for protection.

Where existing fill and cut slopes are presently protected by guardrail, replace damaged and/or substandard guardrail and extend/install new guardrail at locations that do not meet current standard. Also, clear and grind in accordance with SCDOT Engineering Directive (ED) 29.

11.2.9 **Lighting**

Protect the existing lighting system along SC 230 W. Martintown Road. If necessary, due to the DB Teams' final design, relocate existing lighting system components.
11.2.10  **Sight Distance**


If widening into the median in curved sections of I-20 results in insufficient Stopping Sight Distance (SSD) due to the barrier placement, increase the median shoulder width in order to achieve the required SSD.

11.2.11  **Ramps**

Develop ramps in accordance with SCDOT Roadway Design Manual.

New ramp terminal profiles must accommodate intersection sight distance horizontally and vertically for crossroads.

11.2.12  **Intersections**


11.2.13  **Roadside Barriers**

Develop roadside barriers in compliance with SCDOT Standard Drawing and the AASHTO Roadside Design Guide, 2011, 4th Edition. Include the following items in the work:

Guardrail: Ensure that all new guardrail and end treatments are listed on the Qualified Products Policies & Listings.

Provide non-mow strip under guardrail in accordance with the guidance found in the Exhibit 1-1B (SCDOT Supplemental Specifications and Special Provisions) Section 805. When guardrail is adjacent to noise barrier, extend non-mow strip under guardrail to the face of the noise barrier.

Use additional length guardrail posts with compressed guardrail shoulder break contingent upon receiving GDOT approval only where right of way or environmental impacts dictate that standard guardrail shoulder break cannot be built.

Do not use thrie-beam guardrail with critical offset posts at the bridge piers.

Cable Median Barrier: Replace all existing mainline cable median barrier within the project limits that is damaged or does not meet current design standards. Include in this work all necessary median grading, drainage adjustments, and any other work necessary to meet current design standards.
Only single-run cable barrier is allowed. If double-run of cable barrier is warranted then use concrete median barrier with entire inside area paved to median barrier.

Concrete Median Barrier: Provide concrete median barrier along Interstate 20 where existing or proposed medians are less than 36 feet. When concrete median barrier is constructed, pave the inside shoulder to the barrier. Use single slope shaped concrete median barriers.

Provide custom design where required in accordance with Section 13 Structures.

11.2.14 Control Of Access

Follow SCDOT, FHWA, and AASHTO guidelines for Control of Access. Maintain fully controlled access along interstate, all interchanges, and ramp terminals. Provide Controlled Access fencing for the entire project limits where the existing fencing must be relocated. Fencing shall be in accordance with Standard Drawing series 806. Use Security Chain Link Fence 72” and in areas where existing chain link fence is present. In areas without existing Controlled Access fencing and in areas where Controlled Access fencing is to be relocated or reset, place new fence one foot inside the right-of-way. See Exhibit 1-1A (Supplemental Project Design Criteria) for typical details for fence locations.

11.2.15 Typical Section(s) and Pavement Design

All new pavement for the Project shall, at a minimum, meet the pavement designs identified in Table 11-1.

Table 11-1: Pavement Designs

<table>
<thead>
<tr>
<th>I-20 Mainline (South Carolina)</th>
<th>Material</th>
<th>Thickness</th>
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<tr>
<td></td>
<td>Plain PC Conc Pavement, CL 1 Conc</td>
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<td>175 Hot Mix Asphalt Surface Type C inc Matl</td>
<td>1.6 inches</td>
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<tr>
<td></td>
<td>Graded Aggregate Base Course (GAB)</td>
<td>10 inches</td>
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Ramps I-20 at W. Martintown Rd (South Carolina)

<table>
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<th>Thickness</th>
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<tbody>
<tr>
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<tr>
<td>Graded Aggregate Base Course (GAB)</td>
<td>10 inches</td>
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</table>

I-20 Outside and Inside Shoulder (South Carolina)

<table>
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<th>Material</th>
<th>Thickness</th>
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<tbody>
<tr>
<td>Plain PC Conc Pavement, CL 1 Conc</td>
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<tr>
<td>175 Hot Mix Asphalt Surface Type C inc Matl</td>
<td>1.6 inches</td>
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<tr>
<td>Graded Aggregate Base Course (GAB)</td>
<td>10 inches</td>
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PCC Pavement Requirements:

- Transverse Joint Spacing: 15 feet
- Transverse Joint Load Transfer: 1.5 inch dowels, 18 inches long, spaced 12 inches c-c, mainline lanes
- Longitudinal Joint Reinforcement: #4 tie bar, 30 inches long, 30 inches c-c
- Surface Texture: Mainline – Diamond Ground
- Shoulders: Heavy Broom or Turf Drag
- Joint Sealant: Silicone 3/8 inch wide longitudinal and transverse
- Compressive Strength: 4000 psi
- Width of travel lanes: 12 feet. Outside lane 14 feet Widened Slab striped at 12 feet

Pavement work on SC 230 W. Martintown Road shall consist of full depth pavement repair (8 inches) in areas where new pavement is required, where pavement markings will be eradicated and replaced, and where loops will be installed to accommodate the intersection upgrade and signal installation. Full depth pavement repair shall consist of three layers of asphalt for a depth of eight (8) inches. Asphalt for the full depth repair may be either Recycled Asphalt Concrete 12.5mm Superpave, GP 2 Only, including Bituminous Material & H Lime or Recycled Asphalt Concrete 19mm Superpave, GP 1 Only, including Bituminous Material & H Lime.
12 DRAINAGE

12.1 Project Design

Perform all hydrologic and hydraulic drainage designs in accordance with the SCDOT’s Requirements for Hydraulic Design Studies, May 2009, SCDOT’s Stormwater Quality Design Manual, December 2014. Designs, as a minimum, to address:

- Ditch capacity and stability analyses
- Storm sewer systems
- Cross-line pipes
- Sediment and Erosion Control
- Best Management Practices
- Stormwater Quality Design

12.2 Project Scope

12.2.1 Design and Construction Requirements

At locations where fill height is greater than or equal to ten feet, provide a minimum five-foot buffer between the toe of fill and the nearest top of bank of any sideline ditch or swale. See Exhibit 1-1A (Supplemental Project Design Criteria) for a detail.

Design temporary drainage systems to restrict gutter spread to the shoulder width to the degree possible. Minimize ponding at flood sensitive locations. The EOR must evaluate all temporary drainage conditions.

Convert in-place Type-5 and -6 catch basins to Type-17 (719-017-RX) as appropriate. Convert in-place Type-7 to Type-18 (719-018-RX). Replace with new structure where conversions are not practical. Replace all damaged Type-9 catch basins with Drop Inlet Type-112 (719-112-XX) within controlled access locations only. Replace all damaged Type-9 catch basins with Type-9 Ditch Installation (719-009-03) where practical. Replace all other damaged Type-9 catch basins using Type-9 Top Slabs with Integral Throat walls only (719-009-01). Repair or replace damaged inlets such as DI 24x24, Type-12 and Type-112.

Perform field and video inspections on cross-line structures that have not been inspected, in accordance with the SCDOT’s Pipe and Culvert Inventory and Inspection Guidelines (2011) with exceptions noted herein.

- Inspect pipes 18-inches and greater in diameter using a pipe camera system (no laser).
• Inspect box culverts via direct measure techniques utilizing a video camera to document condition, jointing, and obstructions.
• Perform a condition assessment to evaluate inlets, outlets, joints, cracks, spalling, slope, sediment, debris, efflorescence, and rust staining. Additionally note all drop inlet structural deficiencies and outfalls in need of regrading for positive drainage or armoring.
• Prepare a report and summary table for recommended alternatives. Acceptable alternatives are retain, replace, seal, clean, clean and line, or a combination of these. Label one table column Evaluation of Pipe and list the chosen alternatives. A SC Registered Professional Engineer shall sign the report. These corresponding notes are to also be included on the roadway plans.

Prepare the NPDES permit package, to include the Stormwater Pollution Prevention Plan (SWPPP) review checklist included under Exhibit 1-1A (Supplemental Project Design Criteria). The DB Team shall perform all agency coordination to obtain the permit. The SCDOT reviews, signs and submits the package to SCDHEC.

Review timeframes are provided in the following document: www.scdhec.gov/Environment/docs/Permit-Time%20Chart.pdf. Review timeframes for the Stormwater Construction Permit (DHEC Review-Non-Coastal) will be followed for the NPDES permit package.

13 STRUCTURES

13.1 General

This Section 13 contains requirements for:

• Barriers, Railing Walls, Sidewalks
• Retaining walls
• Concrete median barriers

13.2 Barriers Supported by Moment Slabs

When required, provide barriers supported by moment slabs that are designed in accordance with the AASHTO LRFD Bridge Design Specifications. Detail the moment slabs independently of MSE walls as shown on Drawing No. 713-01d of the SCDOT Geotechnical Drawings and Details.
13.3 Retaining Walls

13.3.1 Mechanically Stabilized Earth (MSE) Walls

Design and construct MSE walls in conformance with Supplemental Technical Specification SC-M-713 and SCDOT Geotechnical Drawings and Details, Drawings No. 713-01 and 713-02. If MSE wall is adjacent to the drainage structure, the leveling pads of the MSE wall must be offset a distance away from the drainage structure to facilitate future maintenance and at an elevation which allows sufficient slope stability for open trench working condition.

Design wall heights and lengths to provide adequate cover for roadway and bridge drainage inlets and pipes in the roadway approaches. In addition, design wall heights and lengths to provide adequate slope transitions to maintain stable shoulders and slopes and design clearances and templates in accordance with the design criteria.

Do not use MSE wall structures, with panel type facings, that exceed heights of 40 feet. Do not use MSE wall structures, with modular block type facings, that exceed heights of 30 feet. Do not use MSE wall structures, with modular block type facings, that are visible to interstate traffic. Construct MSE wall facing using precast concrete panels with an Ashlar finish in accordance with SCDOT Standard Drawing 701-950-02 for all MSE walls visible to interstate traffic.

Provide a concrete paved drainage ditch along the top of the wall as shown on the SCDOT Geotechnical Drawings and Details. Size drainage ditch as necessary to prevent water from overtopping the wall.

13.3.2 Reinforced Concrete Walls


Design these walls in accordance with the AASHTO LRFD Bridge Design Specifications and FHWA Publication FHWA NHI-07-071 entitled Earth Retaining Structures, 2008.

Provide a concrete paved drainage ditch along the top of the wall if the retained soil slopes towards the back of the wall. Provide drainage inlets as necessary to prevent water from overtopping the wall.

Spread footings are permitted for concrete retaining walls that are not directly supporting bridges. Step the retaining wall footings when there is a change in grade.
13.3.3 Other Wall Types

Other acceptable wall types include Precast Counterfort walls (which are permitted in conjunction with traditional MSE walls in partial rock cuts), Tangent Pile/Secant Pile walls, Anchored walls, Sheet Pile walls having reinforced concrete coping, Soldier Pile and Lagging walls, and Soil-Nailed walls.

Prior to commencing any designs of other wall types as specified herein, submit to GDOT the wall type selected, design methodology, design criteria, and material and construction specifications for review. In the design criteria, include wall geometry and location, resistance factors, soil properties, and material properties of the wall. Submit to GDOT shop plans and any calculations for other wall types in accordance with Section 725 of the SCDOT 2007 Standard Specifications for Highway Construction.

Provide a concrete paved drainage ditch along the top of the wall if the retained soil slopes towards the back of the wall. Provide drainage inlets as necessary to prevent water from overtopping the wall.

All walls visible from the Interstate shall have a consistent wall finish to match either the MSE or reinforced concrete walls.

13.3.4 Traffic Railing

If the face of a retaining wall is located either within the clear zone or within 30 feet of the edge of a travel lane, design the wall for a Test Level 4 impact and provide a Test Level 4 barrier with a traffic face that is a minimum of 46 inches in height, measured from top of pavement to top of traffic face, and that has a constant 9.1 degree (1H: 6.25V) slope away from traffic. This requirement applies to both sides of the wall. Except for cast-in-place concrete gravity and semi-gravity walls, barriers must be detailed independently of the wall and must be supported by a moment slab. For barriers adjacent to I-20 travel lanes, construct the traffic face of the barrier at an elevation that will accommodate a future condition of four travel lanes plus 12-foot outside shoulder and 10-foot paved minimum inside shoulder of I-20 in each direction.

13.3.5 Anti-Graffiti Coating

Apply an Anti-Graffiti Coating to exposed surfaces of retaining walls.
13.3.6 Plans Preparation

Include retaining wall plans within the set of construction plans and number the sheets using an “S” prefix. Include the following information in the wall construction plans:

13.3.6.1 Design information

Indicate the design parameters in the retaining wall plans.

13.3.6.2 Plan View

Provide a plan view that includes the following information and details:
- Proposed wall location
- Centerline of roadway
- Stationing
- Stations and offsets of beginning and end of wall
- Length of wall
- Guard rail (if required)
- Drainage basins/flumes
- Construction staging (if required)
- North arrow
- Existing structures, features, and utilities in vicinity of the wall if they impact construction
- Temporary shoring (if required)
- Boring locations.

13.3.6.3 Elevation View

Provide an elevation view that shows the top of the wall elevations, footing elevations (when applicable), and the existing ground line. In the elevation view, also show the final ground line along each face of the wall.

13.3.6.4 Cross Sections

Provide section views of the wall.

13.3.6.5 Details

Include details of each wall component and requirements of the architectural or finish treatment. Include details for construction of walls around buried foundations, drainage facilities, pipe penetrations, and utilities.
13.4 Concrete Median Barriers

13.4.1 Concrete Median Barrier

Unless permitted otherwise in Section 11 (Roadways) of this Attachment 1-1, slope the exposed traffic faces of concrete median barrier at a constant 9.1 degrees (1H:6.25V) away from traffic. Design the barrier in accordance with AASHTO LRFD Bridge Design Specifications for a Test Level 4 impact. If the exposed portion of a median barrier exceeds a height of 56 inches above the pavement, the portion of the traffic face that is higher than 56 inches may be detailed vertical or sloped away from traffic at a rate other than 1H:6.25V. Provide a 6-inch minimum top barrier width and a minimum height, measured from top of pavement to top of barrier, of 56 inches. In grade separation sections, the 56-inch minimum height may be measured from the lower pavement surface. Apply the following requirements when designing concrete median barriers:

Utilize Class 6000 concrete as specified by Standard Drawing 805-800-1 or utilize Class 4000 concrete with a minimum 6000psi compressive strength at 28-days. If a Class 4000 concrete with a 6000 psi 28-day compressive strength is utilized, develop the mix design in accordance with Section 701 of the Standard Specifications and demonstrate compliance of strength and workability prior to incorporating into permanent work.

Condition A – Concrete Median Barrier with grade separations of 18 inches or less: Use details from the SCDOT Standard Drawings. The following requirements apply to the details of Standard Drawings 805-810-01 and 805-810-02:

- Details 4, 5, & 15 – Align barrier expansion joints with rigid pavement expansion joints while maintaining the joint spacing limitations of both structures.
- All other details – Either isolate the barrier from rigid pavement by placing a bond breaker at the interface between the rigid pavement and the barrier foundation, or align expansion joints in barrier with pavement expansion joints within the joint spacing limitations of both structures. If bond breaker is used, seal the top of the joint with a silicone sealant having a width of 3/8 inch.

Condition B – Concrete Median Barrier with grade separations between 18 inches and 36 inches require a complete design. Calculate and detail the minimum expansion joint spacing required for stability analysis to resist the overturning of the Test Level 4 impact force at the increased moment arm generated by the grade separation.
Condition C – Concrete Median Barrier with grade separations 36 inches and greater: In addition to the design requirements of Condition B, design the cantilever wall barrier in accordance with SCDOT seismic design requirements.

For Conditions B and C, when evaluating the stability of the barrier, use a transverse force of 10 kips. For Conditions B and C, design and detail the barrier to provide a minimum height, measured from top of higher pavement surface to top of barrier, of 46 inches. Use a 10:1 taper to transition between Condition A barriers and Conditions B and C barriers. Design and detail the barrier foundation independent of the rigid pavement. Provide an isolating bond breaker between the rigid pavement and the barrier structure and seal the top of the joint with a silicone sealant having a width of 3/8 inch.

14  RESERVED

15  LANDSCAPE AND HARDSCAPE ENHANCEMENTS

No additional requirements.

16  SIGNING, PAVEMENT MARKING, SIGNALIZATION

16.1  Permanent Pavement Markings

16.1.1  Thermoplastic Pavement Markings (Asphalt Surfaces)

All thermoplastic markings installed on the interstate mainline or any crossing routes shall meet the requirement of Section 627 of the Standard Specifications.

16.1.2  Polyurea Pavement Markings (Concrete Surfaces)

All polyurea markings installed on the interstate mainline and crossing routes on this project shall be a liquid, multi-component system that includes highly reflective elements.

The polyurea pavement marking lines shall have a minimum dry thickness of 20 mils when placed on concrete and asphalt pavements. The pavement marking material and highly reflective elements shall be applied in a simultaneous operation.

The DB Team shall apply the polyurea resin, mixed at the proper ratio according to the manufacturer’s recommendations, to the pavement surfaces within the proper application temperatures as determined by the material manufacturer. Highly reflective elements shall be injected into the
molten (liquid) polyurea pavement markings in accordance with the manufacturer’s recommendations using a dispenser approved by the manufacturers of both the polyurea materials and the highly reflective elements.

Upon curing, the markings shall be uniformly reflectorized and have the ability to resist deformation caused by traffic throughout the entire length of the line.

If requested by GDOT, the manufacturer of the selected polyurea material shall provide a technical representative, or a manufacturer’s certified representative, to assure proper application technique by the DB Team during the initial installation of the product.

All materials will be accepted based on manufacturer's certifications.

16.1.3 Reserved

16.2 Permanent Signing

Cantilever sign structures are allowed in South Carolina.

16.2.1 Maintenance of Mainline and Ramp Directional and Information (LOGO) Signing Mounted on I-Beam Breakaway Posts

The existing mainline and ramp directional and information signs mounted on I-beam breakaway posts may have to be relocated due to the construction. Where relocation is necessary, the mainline signs should be mounted temporarily on 4”x6” wood posts using the method detailed on Standard Drawing 625-120-00. Ramp information signs (logo) should be mounted temporarily on 4”x4” wood posts. No separate payment will be made for these relocations. All signs are to be maintained throughout construction.

In addition, the DB Team will be responsible for replacing signs damaged during construction which are to be retained (i.e. logo signs) and erected as part of the permanent signing.

16.2.2 Special Instructions to the DB Team

A conceptual signing plan is included in Volume 2, Attachment 16-1, which shows the proposed sign locations and sign layouts for all overhead signs as well as all signs mounted on I-beam breakaway posts. The conceptual plan does not show the location of flat sheet signs mounted on u-section posts (mile markers, warning signs, regulatory signs, etc.) along the I-20
mainline and at the SC 230 interchange; these signs shall be included in the comprehensive signing plan and replaced as part of this Project.

The DB Team shall contact GDOT within 30 days of the issuance of the NTP 2 to review the conceptual signing plan and the overall signing requirements of the DB Documents. A complete as-built set of signing plans shall be submitted to GDOT at the conclusion of the Project.

Once the Contract has been awarded, the successful DB Team is advised that GuideSign and/or SignCAD files for the all of the signs shown on the conceptual signing plan are available from GDOT. Written requests for the GuideSign and/or SignCAD files shall be addressed to GDOT. The signs are designed using GuideSign and/or SignCAD software and Clearview Fonts.

Walkways should be included in the design of all new overhead structures as noted in the SCDOT Standard Specifications. Sign lighting systems will not be required on the new overhead structures.

Guardrail shall be included for all overhead uprights located within the clear zone on either side of the travel way. For guardrail installations that protect sign uprights, the face of the guardrail shall be located approximately one (1) foot behind the edge of shoulder. The center of the upright should be located approximately nine (9) feet behind the face of guardrail.

The DB Team will be responsible for obtaining soil borings to be used for foundation designs for all new overhead sign structures.

The DB Team is advised that logo signs may have to be relocated and I-beam supports replaced if exit ramps are significantly lengthened. Likewise, if entrance ramps are significantly lengthened, Speed Limit and Post Interchange Mileage signs shall be relocated and I-beam supports replaced. Correct location for Speed Limit signs is 1500 feet beyond the end of the entrance taper. Correct location for Post Interchange Mileage Signs is 2500 feet beyond the end of the entrance taper.

The DB Team is advised that all signs have a unique barcode sticker attached to the back of each sign and each sign assembly has a unique barcode sticker attached to one post of the assembly. The DB Team will be required to record the barcode number for each sign and the associated assembly that is removed, replaced or relocated. These numbers and the date that the sign and assembly were removed, replaced or relocated shall be recorded on a form and submitted to GDOT.
16.2.3 Project Scope

16.2.3.1 Design and Construction Requirements

Use regular font for applicable content.

16.3 Traffic Signals

16.3.1 General

The DB Team is responsible for all interim traffic signal designs and operations due to revisions to intersection geometry, revisions to traffic patterns, lane closures or other construction activities. For major deviations from the existing signal geometry or operations (revisions to intersection laneage or phasing) temporary traffic signal plans shall be submitted for review and approval.

The DB Team shall be responsible for the efficient operations of all traffic signals throughout the duration of the project. Revised signal system timings shall be provided and implemented during major construction phases to accommodate traffic during revisions to intersection geometry, revisions to traffic patterns, lane closures or other construction activities.

In addition to maintaining the detection, any work at the ramps that impact the traffic signal, such as damage to fiber interconnect or any other signal appurtenances, shall be immediately repaired/replaced to SCDOT standards. Coordination with GDOT shall occur to ensure the Work will avoid damaging traffic signal utilities as much as is feasible.

Provide new traffic signals at the following intersection locations with all new appurtenances. The traffic signals shall be completely installed, inspected, tested and fully operational prior to opening the new roadways/intersections controlled by the signals to traffic. The new signal installations are:

- SC-230 (W. Martintown Rd) at I-20 Eastbound Ramps

New permanent traffic signals shall incorporate steel strain poles, span wire in standard box configuration, inductive loops, and ground-mounted cabinet and controller. Flashing yellow arrow heads shall be incorporated into the signal designs when permissive, protected-permissive, or protected phasing is warranted. As a minimum, provide push button assemblies with sign R10-4a to ensure call and adequate minimum green time for pedestrians crossing over SC 230 W. Martintown Road.
16.3.2 Criteria

16.3.2.1 Traffic Signal Design Policies

All signal work under this Contract shall be performed under: the SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION, "STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION", Latest Edition; the SCDOT TRAFFIC SIGNALS TECHNICAL SUPPLEMENTAL SPECIFICATIONS; the SCDOT TRAFFIC SIGNAL STANDARD DRAWINGS; these SCDOT TRAFFIC SIGNAL SPECIAL PROVISIONS; the "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS" (latest revision); the SCDOT TRAFFIC SIGNAL DESIGN GUIDELINES, AS AMENDED BELOW; and the PLANS.

The 2009 Edition of the SCDOT TRAFFIC SIGNAL DESIGN GUIDELINES is amended as follows: Loop detector design shall utilize the Interim Traffic Signal Loop Chart included in Exhibit 1-1A (Supplemental Project Design Criteria) for all new permanent signals in this Project.

16.3.2.2 Equipment

SCDOT Supplied Equipment: SCDOT will furnish at no cost to the DB Team the signal communications equipment as described in the attached SCDOT IT Services Public Interest Finding included in Exhibit 1-1A. The DB Team shall contact the SCDOT IT Services group a minimum of 60 days in advance of any anticipated need for equipment or services covered by this Public Interest Finding to ensure adequate time for equipment delivery and integration.

DB Team Supplied Equipment: All DB Team supplied equipment shall be in accordance with the SCDOT Traffic Signal Supplemental Technical Specifications, 675.0 General Provisions.

16.3.2.3 Maintenance and Operations During Construction

Section 1.4 (Operations during Construction) and Section 1.5 (Maintenance/Repairs) of the SCDOT Traffic Signal Supplemental Specifications, 675.0 General Provisions, are amended as follows: the DB Team shall be responsible for the maintenance and operations of all existing and newly installed signals, from the commencement of any signal construction activities until the Final
Acceptance. The DB Team shall be responsible for temporary controller time settings with approval of GDOT.

At that point in the project when construction activity is about to occur which could affect the operation of any traffic signal within this project, the DB Team shall request GDOT's concurrence, and the DB Team shall assume responsibility for maintenance of all traffic signals within this project. This request shall be in writing to GDOT and will require a written response. In the absence of the request, any activity of the DB Team which affects the operation of any traffic signal within this project shall be deemed evidence of the DB Team's assumption of responsibility for the maintenance of all traffic signals within this Project.

16.3.2.4 Maintenance of Traffic

The DB Team shall execute traffic control in compliance with the DB Documents.

16.3.2.5 Catalog Cuts

The DB Team shall provide all catalog descriptions and documentation to GDOT.

16.3.3 Deliverables

16.3.3.1 Conceptual Traffic Signal and Communications Plans

Provide Conceptual Traffic Signal Plans and Traffic Signal Communications Plans for all of the proposed traffic signal locations for the purposes of coordinating any required certifications.

16.3.3.2 Temporary Signal Plans

If temporary traffic signals are utilized within this Project, for temporary traffic control of an intersection or to accommodate work zone staging for roadway work, temporary signal plans with clearance timing calculations and diagrams shall be provided for review. These plans are to be submitted concurrent to any review periods established for traffic signal plan review or any Maintenance of Traffic Plan reviews.
16.3.3.3 Signal Plans

Provide signal plans in the Final Plan submittal for all of the proposed signals locations. Clearance timing calculations and diagrams shall be included with these plans for review.

16.3.3.4 Traffic Signal Communications Plans

Provide Traffic Signal Communications Plans in the Final Plan submittal for all of the proposed signals locations. These plans shall detail the design of any fiber optic runs, wireless communication paths, attachments, directional bores, or other appurtenances necessary for the proper operation of the traffic signal communication systems.

16.3.3.5 As-Built Signal Plans

Provide As-Built “red-lined” signal plans to GDOT after the signal work is completed.

17 INTELLIGENT TRANSPORTATION SYSTEMS

No additional requirements.

18 TRAFFIC CONTROL

No additional requirements.

19 MAINTENANCE DURING THE DESIGN-BUILD PROCESS

No additional requirements.

20 BICYCLE AND PEDESTRIAN FACILITIES

No additional requirements.

21 RESERVED

22 RESERVED

23 RESERVED
Georgia Department of Transportation

Technical Provisions
For
Design-Build Agreement
P.I. No. 210327-

Exhibit 1-1A
Supplemental Project Design Criteria

- Fence Locations
- Toe Ditch Detail
- Stormwater Pollution Prevention Plan (SWPPP) Checklist
- Drawing_805-710-SP
- Interim Traffic Signal Loop Chart
- Roadway Design Criteria
# Stormwater Pollution Prevention Plan (SWPPP) Checklist
## For SCDOT Construction Activities (SCR160000)

### I. PROJECT IDENTIFICATION:  (RPG Hydraulic Team Leader Task and/or Consultant)

#### A. PROJECT TYPE:

<table>
<thead>
<tr>
<th>PIN #: ___________________</th>
<th>Road #: ____________________</th>
<th>County: __________________</th>
</tr>
</thead>
<tbody>
<tr>
<td>☐ Road construction</td>
<td>☐ Bridge construction</td>
<td>☐ Other: __________________</td>
</tr>
</tbody>
</table>

Acres Disturbed: __________

The “C-SWPPP” must be prepared by a qualified individual (SC Registered Professional Engineer, Landscape Architect, or Tier B Land Surveyor) for each project that disturbs 1 acre or more, and construction activities that result in land disturbance of greater than 0.5 acres located within one-half mile of a coastal receiving water body within the Coastal Zone. The Coastal Zone consists of the following counties: Beaufort, Berkeley, Charleston, Colleton, Dorchester, Georgetown, Horry, and Jasper.

#### B. COASTAL COUNTY PROJECT:

[ ] Yes  [ ] No Is the project located in one of the following eight coastal counties: Beaufort, Berkeley, Charleston, Colleton, Dorchester, Georgetown, Horry or Jasper?

### II. WATER BODY INFORMATION:  (Environmental Permit Coordinator Task)

#### A. Impairments and Classification

1. [ ] Yes  [ ] No Does the project discharge to a 303(d) listed water body?

   List Impairment(s): ___________________________________________________

2. [ ] Yes  [ ] No Has a TMDL been developed?

   List Impairment(s): ___________________________________________________

   If yes, is the DOT listed as a potential contributor of any of the pollutants?

   List Pollutant(s): ___________________________________________________

3. [ ] Yes  [ ] No Does the project discharge stormwater to sensitive waterbodies (Trout Waters, Outstanding Resource Waters (ORW), or Shellfish Harvesting Areas)?

   List waterbody classification: _________________________________________

#### B. Coastal Issues

1. [ ] Yes  [ ] No Are shellfish beds present within 1000 feet of the project discharge point(s)?

2. [ ] Yes  [ ] No Is the project within the OCRM Critical Area?

3. [ ] Yes  [ ] No Have all appropriate Coastal Zone Consistency Checklists been completed?

#### C. Wetland Locations:

1. [ ] Yes  [ ] No Have all wetland locations been mapped and added to the final plans?

2. [ ] Yes  [ ] No If there are wetlands, is a double row of silt fence proposed in areas adjacent to wetlands and land disturbance?
Stormwater Pollution Prevention Plan (SWPPP) Checklist
For SCDOT Construction Activities (SCR160000)

D. Wetlands and Permits

1. ☐ Yes ☐ No ☐ N/A 404 permit obtained?
2. ☐ Yes ☐ No ☐ N/A 401 certification obtained?
3. ☐ Yes ☐ No ☐ N/A Navigable Waters permit?
4. ☐ Yes ☐ No ☐ N/A OCRM Critical Area permit?
5. Other Permits: ________________________________________________________________
6. How many freshwater wetland acres will be impacted? ____________________________
7. How many tidal wetland acres will be impacted? _________________________________
8. ☐ Yes ☐ No ☐ N/A Have all the required permit approvals and certifications been obtained?

III. WATER QUALITY - Sediment Control & Erosion Prevention (RPG Hydraulic Team Lead Task)

A. General Design and Report Information

Note: For projects that disturb 50 acres or more, submit one (1) set of plans and C-SWPPP to DHEC for review along with all design/assessment calculation reports. For projects that disturb less than 50 acres, submit three (3) sets of plans.

1. ☐ Yes ☐ No ☐ N/A Is the NOI prepared? C-SWPPP section:_____________________
2. Anti-Degradation Requirements:
   a. ☐ Yes ☐ No ☐ N/A Does the project disturb 25 acres or more that discharges into an impaired waterbody? If Yes, then anti-degradation rule apply that require a Quantitative and Qualitative Analysis.
   b. ☐ Yes ☐ No ☐ N/A Is the Quantitative and Qualitative Analysis Report (calculations report) included in the C-SWPPP submission?
      C-SWPPP section:_____________________
3. Are the following maps included in the SWPPP?
   a. ☐ Yes ☐ No ☐ N/A Vicinity map of the project area C-SWPPP section:_____________________
   b. ☐ Yes ☐ No ☐ N/A Soils map C-SWPPP section:_____________________
   c. ☐ Yes ☐ No ☐ N/A Flood map C-SWPPP section:_____________________
   d. ☐ Yes ☐ No ☐ N/A Topographical map C-SWPPP section:_____________________
   e. ☐ Yes ☐ No ☐ N/A Drainage area map C-SWPPP section:_____________________
4. Are the following items included in the C-SWPPP Narrative? C-SWPPP section:_____________________
   a. ☐ Yes ☐ No ☐ N/A Description of the nature of the construction activity.
   b. ☐ Yes ☐ No ☐ N/A Description of erosion prevention measures and sediment controls.
   c. ☐ Yes ☐ No ☐ N/A Identification of all receiving water bodies. Erosion Control Data Sheet
5. □ Yes  □ No  □ N/A  Is there a pre/post development hydrologic analysis?

   C-SWPPP section:__________________

6. □ Yes  □ No  □ N/A  Has the outfall channel capacity been evaluated for the 10-year peak discharge based on pre and post construction conditions? (Note: the design discharge will be the 10, 25, or 50-year peak discharge depending on the road classification and the system or structure type).

   C-SWPPP section:__________________

7. Are the following elements included in the Construction Plans?
   a. □ Yes  □ No  □ N/A  Are the limits of disturbance and/or NPDES line and Right-of Way limits clearly shown on the construction plans?
   b. □ Yes  □ No  □ N/A  Are all discharge points identified and shown with proposed velocity dissipation BMPs and erosion controls to provide non-erosive flows?
   c. □ Yes  □ No  □ N/A  Indicate location of all Waters of the State and Wetlands.
   d. □ Yes  □ No  □ N/A  Are locations and details provided for any non-standard BMPs (either temporary or permanent controls)?

B. Perimeter Control

   Construction Plan Sheet(s)


2. □ Yes  □ No  □ N/A  Does all Silt Fence meet the requirement of 100 maximum linear feet drainage area, storage, and overtopping, see Supplemental Technical Spec. SC-M-815-2.

3. □ Yes  □ No  □ N/A  For any proposed Perimeter Control BMP, see Supplemental Technical Spec. SC-M-815-17.

C. Slope Protection & other Erosion Control

1. □ Yes  □ No  □ N/A  Are diversion measures shown and type? (diversion dikes & berms, swales or silt ditches) (Drawing Nos. 815-605-10, 20, 815-008-01 & 02). For Pipe Slope drains see the Field Manual.

   Construction Plan Sheet(s)

2. Rolled Erosion Control Products

   Erosion Control Data Sheet

   a. Erosion Blankets
      □ Yes  □ No  □ N/A  Does the project have slopes 2.0H:1V or flatter? If so, Erosion Control Blankets (ECBs) or a mulch equivalent is required for temporary stabilization Reference Supplemental Technical Specifications SC-M-815-9, and SC-M-815-11, and Standard Drawing No. 815-605-30.

   b. Matting
      □ Yes  □ No  □ N/A  Does the project have slopes greater than 2.0H:1V? If so, use Turf Reinforcement Matting (TRMs). Reference Supplemental Technical Specification SC-M-815-9, and Standard Drawing No. 815-605-30.


   Construction Plan Sheet(s)


   Construction Plan Sheet(s)
## D. Discharge Point Stabilization

1. **Yes** ☐ **No** ☐ **N/A** ☐ Are locations shown for any Pipe Outlet Stabilization? Indicate locations on the construction plan sheets. (Drawing Nos. 804-305-01, 02, & 03 and 804-310-00).

## E. Ditch Checks

1. **Yes** ☐ **No** ☐ **N/A** ☐ Are Rock Ditch Check Dams proposed? (Refer to Drawing No. 815-105-00).

2. **Yes** ☐ **No** ☐ **N/A** ☐ Are Enhanced Stacked Ditch Checks proposed, refer to Supplemental Technical Specification SC-M-815-19. Refer to (Drawing No. 815-106-00) for height and spacing.

3. **Yes** ☐ **No** ☐ **N/A** ☐ Are Sediment tubes for Ditch Checks proposed? Refer to Supplemental Tech Specs SC-M-815-1 and SC-M-815-12 and refer to Drawing No. 815-205-00.

## F. Sediment Basins

1. **Yes** ☐ **No** ☐ **N/A** ☐ Is a standard sediment basin(s) proposed? (Drawings 815-305-01, 02, 03, 04, 05, 06, & 07).

2. If the non-standardized basin proposed then:
   a. **Yes** ☐ **No** ☐ **N/A** ☐ Are locations included for the porous baffle(s), emergency spillway, outlet structure, sediment stake, inlet pipes, velocity controls & outlet protection (referenced on plans)?
   b. **Yes** ☐ **No** ☐ **N/A** ☐ Are the basins designed to accommodate sediment loading and meet a removal efficiency of 80 percent TSS for the 10-year, 24-hr. design event, or 3,600 cubic feet of sediment storage volume per disturbed acre that drains to the outfall point excluding off site flows, whichever is less?
   c. **Yes** ☐ **No** ☐ **N/A** ☐ Is surface withdrawal discharge included in the sediment basin design?
   d. **Yes** ☐ **No** ☐ **N/A** ☐ Calculations must be provided that show the basin has been designed to meet the same standards as required for a standard sediment basin.

## G. Sediment Dams

(Applicable for drainage areas with 2 to <10 acres disturbed)

1. **Yes** ☐ **No** ☐ **N/A** ☐ Are there Standard Sediment Dams used for this project? Refer to (Drawing Nos. 815-405-01, 815-405-02).

2. **Yes** ☐ **No** ☐ **N/A** ☐ Are there equivalent measures used in place of sediment dams?

3. **Yes** ☐ **No** ☐ **N/A** ☐ Are there any nonstandard sediment dam(s) proposed for this project? If so, then calculations must be provided that show the basin has been designed to meet the same standards as required for a standard sediment dam.

   **C-SWPPP section:**____________________

4. **Yes** ☐ **No** ☐ **N/A** ☐ Is the area draining to each basin been outlined in a drainage area map?

   **C-SWPPP section:**____________________

5. **Yes** ☐ **No** ☐ **N/A** ☐ Are any Sediment Dam for Pipe Inlets proposed. See (Drawing No. 815-406-00).
### Stormwater Pollution Prevention Plan (SWPPP) Checklist
**For SCDOT Construction Activities (SCR160000)**

#### H. Inlet Protection

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
<th>N/A</th>
<th>Are inlet protection locations shown or referenced?</th>
<th>Construction Plan Sheet(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td></td>
<td></td>
<td></td>
<td>Supplemental Technical Spec. SC-M-815-8. Determine flows to inlet in order to determine type. Indicate type(s) on Erosion Control Data Sheets. :</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>□ Type A: Low Flow. For Filter Fabric &amp; Sediment Tube types: Refer to Drawing No. 815-001-01.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>□ Type B: Medium Flow: Refer to Drawing No. 815-002-00.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>□ Type D: High Flow, for drainage areas up to 2 acres: Refer to Drawing No. 815-002-0.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>□ Type E: Surface Course curb inlets: Refer to Drawing No. 815-005-00).</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>□ Type F: For drainage areas less than 1 acre. Non-Weighted and Weighted Refer to Drawing No: 815-006-00.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>□ Type F: For use as a Slope Interruption Device: Refer to Type F: Drawing No 815-001-02).</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>□ Type G: Medium Flow, for drainage areas less than 1 acre. Field Manual only. (Drawing No. SC-11).</td>
<td></td>
</tr>
</tbody>
</table>

#### I. Post Construction BMPs

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
<th>N/A</th>
<th>Are any proposed Stormwater Manufactured Treatment Devices (MTDs) Type 1 Separation Devices? Show locations. See Supplemental Technical Spec SC-M-815-13.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td></td>
<td></td>
<td></td>
<td>Are there any post construction water quality ponds</td>
</tr>
</tbody>
</table>

**Note:** This form is to be kept in the Hydro SWPPP folder and in the CSWPPP Report.

### Signatures

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
<th>N/A</th>
<th>Has the C-SWPPP documents been prepared and signed?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
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<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>□ SCDOT Hydraulic Team Leader Signature: _________________ Date: ____________</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>□ SCDOT Environmental Permit Coord. Signature: _________________ Date: ____________</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>□ Consultant Program Manager Signature: _________________ Date: ____________</td>
</tr>
<tr>
<td>Speed (mph)</td>
<td>Setback (feet)</td>
<td>Equiv. Second</td>
<td>Min Initial</td>
<td>Max Initial</td>
</tr>
<tr>
<td>------------</td>
<td>----------------</td>
<td>---------------</td>
<td>-------------</td>
<td>-------------</td>
</tr>
<tr>
<td>30</td>
<td>80*</td>
<td>1.8</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>35</td>
<td>200</td>
<td>3.9</td>
<td>15</td>
<td>24</td>
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<td></td>
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<td>40</td>
<td>300</td>
<td>5.1</td>
<td>15</td>
<td>34</td>
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<tr>
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<td></td>
<td></td>
</tr>
<tr>
<td>60</td>
<td>485</td>
<td>5.5</td>
<td>15</td>
<td>53</td>
</tr>
<tr>
<td>&gt;45</td>
<td>255', 385' **</td>
<td>Varies (4-6)</td>
<td>15</td>
<td>Varies (30-42)</td>
</tr>
</tbody>
</table>

### SCDOT Setback Detector Placement and Volume Density Timings

**Figure 4-7**

Setback distances are approximate and may be adjusted based on presence of driveways or pavement types.

* Considered low speed - decision zone not an issue - volume density not used

** Settings for existing setback detection, consisting of 2 6’X6’ loops per lane at 255’ and 385’
SCDOT Stop Bar Detector Placement

<table>
<thead>
<tr>
<th>RECOMMENDED</th>
<th>TIMING PARAMETERS</th>
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</thead>
<tbody>
<tr>
<td>Speed (mph)</td>
<td>Setback (feet)</td>
</tr>
<tr>
<td>n/a</td>
<td>@Stop Bar</td>
</tr>
<tr>
<td>Equiv. Second</td>
<td>n/a</td>
</tr>
<tr>
<td>Min Initial</td>
<td>Max Initial</td>
</tr>
<tr>
<td>Typically 4-8 seconds*</td>
<td>n/a</td>
</tr>
<tr>
<td>Passage</td>
<td>Min Gap</td>
</tr>
<tr>
<td>2-3</td>
<td>n/a</td>
</tr>
</tbody>
</table>

(Typically side streets and left turn lanes)

*This value can be increased to accommodate pedestrian crossing time each cycle; however additional minimum green time can be obtained by the activation of a pedestrian button.

<table>
<thead>
<tr>
<th>1 loop per lane</th>
<th>2 loops per lane</th>
</tr>
</thead>
<tbody>
<tr>
<td>Approach Lanes</td>
<td></td>
</tr>
<tr>
<td>Single through lane</td>
<td>2-3</td>
</tr>
<tr>
<td>Two through lanes</td>
<td>1.5-2.0</td>
</tr>
<tr>
<td>Three (or more) through lanes</td>
<td>1.0-1.5</td>
</tr>
</tbody>
</table>

Volume Density Seconds per Actuation

*These values are approximate and engineering judgement should be used. When traffic is evenly distributed over multiple lanes, use lower number. Increase for high truck traffic.*
<table>
<thead>
<tr>
<th>Design Element</th>
<th>I-20</th>
<th>I-20 Ramps</th>
<th>Loop Ramps</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roadway Classification</td>
<td>Interstate (Urban)</td>
<td>Ramp (Interstate - Urban)</td>
<td>Ramp (Interstate - Urban)</td>
<td></td>
</tr>
<tr>
<td>Basic No. of Lanes</td>
<td>6-4 (3-2 in each direction)</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Design Vehicle</td>
<td>WB-62</td>
<td>WB-62</td>
<td>WB-62</td>
<td>SCDOT RDM 9.2-8 Table 9.2D</td>
</tr>
<tr>
<td>Design Speed (MPH)</td>
<td>70</td>
<td>Urban 60</td>
<td>35 Desirable</td>
<td>SCDOT RDM 17.3-2 Figure 17.3-B; 10.5-3 Figure 10.5B-Ramp Design Speeds</td>
</tr>
<tr>
<td>Lane Width</td>
<td>12'</td>
<td>16' (single lane)</td>
<td>16' (single lane)</td>
<td>SCDOT RDM 17.3-2 Figure 17.3-B; 10.5-6 Figure 10.5D-Typical Ramp Cross Sections</td>
</tr>
<tr>
<td>Inside Shoulder Width ^1</td>
<td>10' Paved (w/CMB)</td>
<td>10' Overall</td>
<td>10' Overall</td>
<td>SCDOT RDM 17.3-2 Figure 17.3-B; 10.5-6 Figure 10.5D-Typical Ramp Cross Sections</td>
</tr>
<tr>
<td></td>
<td>12' Overall (w/o CMB &amp; 3-lane</td>
<td>4' Paved</td>
<td>4' Paved</td>
<td></td>
</tr>
<tr>
<td></td>
<td>10' Paved (3-lane)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>10' Overall (2-lane)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4' Paved (2-lane)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Outside Shoulder Width</td>
<td>12' Overall</td>
<td>10' Overall</td>
<td>10' Overall</td>
<td>SCDOT RDM 17.3-2 Figure 17.3-B; 10.5-6 Figure 10.5D-Typical Ramp Cross Sections</td>
</tr>
<tr>
<td></td>
<td>10' Paved</td>
<td>6' Paved</td>
<td>6' Paved</td>
<td></td>
</tr>
<tr>
<td>Typical Roadway Cross Slope</td>
<td>Drain Both Sides</td>
<td>2%</td>
<td>2%</td>
<td>SCDOT RDM 17.3-2 Figure 17.3-B; 10.5-6 Figure 10.5D-Typical Ramp Cross Sections</td>
</tr>
<tr>
<td></td>
<td>2% to outside (2 outside lane)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2% to median (inside lane)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Drain Outside</td>
<td>2% (2 inside lane)</td>
<td>2% (3rd lane - outside lane)</td>
<td></td>
</tr>
<tr>
<td>Inside Paved Shoulder Cross Slope</td>
<td>2% Draining Outside w/ CMB</td>
<td>4% Paved</td>
<td>4% Paved</td>
<td>SCDOT RDM 17.3-2 Figure 17.3-B &amp; Fig 17.2B; 17.2C; 10.5-6 Figure 10.5D-Typical Ramp Cross Sections</td>
</tr>
<tr>
<td></td>
<td>4% Draining Inside-Paved w/o CMB</td>
<td>8% Unpaved</td>
<td>8% Unpaved</td>
<td></td>
</tr>
<tr>
<td></td>
<td>8% Draining Inside-Unpaved w/o CMB</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Outside Paved Shoulder Cross Slope</td>
<td>4.0% Paved</td>
<td>4% Paved</td>
<td>4% Paved</td>
<td>SCDOT RDM 17.3-2 Figure 17.3-B &amp; Fig 17.2B; 17.2C; 10.5-6 Figure 10.5D-Typical Ramp Cross Sections</td>
</tr>
<tr>
<td></td>
<td>8% Unpaved</td>
<td>8% Unpaved</td>
<td>8% Unpaved</td>
<td></td>
</tr>
<tr>
<td>E max</td>
<td>8%</td>
<td>8%</td>
<td>8%</td>
<td>SC RDM Figure 5.3A</td>
</tr>
<tr>
<td>Design Element</td>
<td>I-20</td>
<td>I-20 Ramps</td>
<td>Loop Ramps</td>
<td>Comments</td>
</tr>
<tr>
<td>---------------------------------------------------</td>
<td>-----------------------</td>
<td>--------------------</td>
<td>------------------</td>
<td>--------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Minimum Curvature of Horizontal Curve</td>
<td>1810' for 70 MPH</td>
<td>960' for 55 MPH</td>
<td>314' Des [35mph]</td>
<td>AASHTO, 2011 Page 3-47, Table 3-10b &amp; SC DOT RDM pg 17.3-5 Table 17.3-B</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>134' Min. [25mph]</td>
<td>Fig. 10.5-C; Fig 5.2-B</td>
</tr>
<tr>
<td>Minimum Curvature of Horizontal Curve using Reverse Crown and Normal Cross Slope</td>
<td>10263' (RC) for 70 MPH</td>
<td>8440' (RC) for 60 MPH</td>
<td>N/A</td>
<td>AASHTO, 2011 Page 3-47, Table 3-10b &amp; SC DOT RDM pg 17.3-5 Table 17.3-B</td>
</tr>
<tr>
<td></td>
<td>14439' (NC) for 70 MPH</td>
<td>11500' (NC) for 60 MPH</td>
<td>N/A</td>
<td>1.5:1 max ratio when go from flatter to sharper compound curves SCDOT RDM Section 5.2.2.3</td>
</tr>
<tr>
<td>Minimum Length of Horizontal Curve (ft.)</td>
<td>Δ greater than or equal to 5 degrees LC = 2100' * for 70 MPH</td>
<td>Δ greater than or equal to 5 degrees LC = 900' * for 60 MPH;</td>
<td>Δ greater than or equal to 5 degrees LC = 500' *</td>
<td>AASHTO, 2011 Section 3.3.13 pg 3-111; SCDOT RDM Section 5.2.5 Figure 5.2-E</td>
</tr>
<tr>
<td></td>
<td>Δ less than 5 degrees LC = 500' + 100' x ( 5°-Δ )</td>
<td>Δ less than 5 degrees LC = 500' + 100' x ( 5°-Δ )</td>
<td>Δ less than 5 degrees LC = 500' + 100' x ( 5°-Δ )</td>
<td>Δ less than 5 degrees LC = 500' + 100' x ( 5°-Δ )</td>
</tr>
<tr>
<td>SE Runoff Rate (Lr) Horizontal (ft) / 1.0% SE change</td>
<td>L depends on radii</td>
<td>L depends on radii</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(1 Lane/2Lane ) Rotation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Desirable super elevation Runoff Transition Split</td>
<td></td>
<td></td>
<td></td>
<td>SCDOT RDM Section 5.3</td>
</tr>
<tr>
<td>In Tangent</td>
<td>2/3L</td>
<td>2/3L</td>
<td>2/3L</td>
<td></td>
</tr>
<tr>
<td>In Curve</td>
<td>1/3L</td>
<td>1/3L</td>
<td>1/3L</td>
<td></td>
</tr>
<tr>
<td>Max. Angle of Horizontal Deflection Without use of a Curve</td>
<td>1 degree or Less</td>
<td></td>
<td></td>
<td>SCDOT RDM pg 5.2-6 section 5.2.4</td>
</tr>
<tr>
<td>Minimum Tangent Between Curves In Same Direction (Lc)</td>
<td>1500</td>
<td>1500</td>
<td>N/A</td>
<td>SCDOT RDM pg 5.2-5 section 5.2.2.5</td>
</tr>
<tr>
<td>Entrance Terminal Accel. Length</td>
<td>N/A</td>
<td>580' for 50 MPH</td>
<td>1230' for 35 to 70 MPH</td>
<td>AASHTO, 2011 Page 10-110, Table 10-3; SCDOT RDM pg 10.4-14 Figure 10.4-J</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1420’ for 25 to 70 MPH</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## South Carolina Design Criteria

<table>
<thead>
<tr>
<th>Design Element</th>
<th>I-20</th>
<th>I-20 Ramps</th>
<th>Loop Ramps</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exit Terminal Decel. Length</td>
<td>N/A</td>
<td>340' for 50 MPH</td>
<td>N/A</td>
<td>AASHTO, 2011 Page 10-115, Table 10-5; SCDOT RDM pg 10.4-6 Figure 10.4-D</td>
</tr>
<tr>
<td>Clear Zone from Edge of Travel Lane</td>
<td>Varies - per AASHTO Roadside Design Guide</td>
<td></td>
<td></td>
<td>AASHTO 2011 Roadside Design Guide: Table 3-1</td>
</tr>
<tr>
<td>Stopping Sight Distance</td>
<td>730' for 70 MPH</td>
<td>570' for 60 MPH</td>
<td>250' for 35 MPH</td>
<td>AASHTO, 2011 Page 3-4, Table 3-1 SCDOT RDM, pg 17.3-8 Figure 17.3C; Fig. 10.5.C</td>
</tr>
<tr>
<td>Maximum Profile Grade (%)</td>
<td>4.00%</td>
<td>3% to 5%</td>
<td>4% - 7%</td>
<td>AASHTO Design Standards for Interstate System 2016, pg 3 Table 2; AASHTO, 2011 Page 10-93 and Page 8-4 Table 8-1</td>
</tr>
<tr>
<td>Minimum K Value for Crest Vertical Curve</td>
<td>247 for 70 MPH</td>
<td>151 for 60 MPH</td>
<td>29 Des 12 Min</td>
<td>SCDOT RDM, pg 19.3-8 Figure 17.3C; Fig. 10.5.C</td>
</tr>
<tr>
<td>Minimum K Value for Sag Vertical Curve</td>
<td>181 for 70 MPH</td>
<td>136 for 60 MPH</td>
<td>49 Des 26 Min</td>
<td>AASHTO, 2011 Page 3-161, Table 3-6; SCDOT RDM, pg 6.5-2 Figure 6.5A &amp; pg 17.3-8 Figure 17.3C</td>
</tr>
<tr>
<td>Fore Slope Ratio(max/normal)</td>
<td>6:1(cut section)</td>
<td>6:1(cut section)</td>
<td>6:1(cut section)</td>
<td>SCDOT RDM, pg 17.3-2 Figure 17.3-B; 10.5-D Steeper than 4:1 requires Guardrail</td>
</tr>
<tr>
<td>Back Slope Ratio (max/normal)</td>
<td>2:1/6:1</td>
<td>2:1/6:1</td>
<td>2:1/6:1</td>
<td>SCDOT HDM, pg 17.3-2 Figure 17.3-B</td>
</tr>
<tr>
<td>Vertical Clearance: Roadway over Roadway</td>
<td>17'-0&quot; for New/Replaced 16'-0&quot; Existing</td>
<td>18'-0&quot; Pedestrian Brd</td>
<td>17'-6&quot; Overhead Signs</td>
<td>SCDOT HDM, pg 17.3-2 Figure 17.3-B</td>
</tr>
<tr>
<td>Vertical Clearance: Roadway Over Railway</td>
<td>23'-0&quot;</td>
<td>23'-0&quot;</td>
<td>23'-0&quot;</td>
<td>SCDOT HDM, pg 17.3-2 Figure 17.3-B</td>
</tr>
</tbody>
</table>

### Notes:

1. SCDOT RDM: On high speed freeway and Interstate sections with six or more lanes, where truck traffic exceeds 250 DDHV, a paved inside shoulder width of 12-ft should be considered.
Georgia Department of Transportation

Technical Provisions

For
Design-Build Agreement
P.I. No. 210327-

Exhibit 1-1B
SCDOT Supplemental Specifications and
Special Provisions

- Section 805 Non-Mow Strip Under Guardrail
- Supplemental Technical Specification for Mechanically Stabilized Earth (MSE) Walls
- Traffic Signal Material Specifications
- Traffic Signal Supplemental Technical Specifications
- Traffic Signal Special Provisions Form
(1) **SECTION 805: NON-MOW STRIP UNDER GUARDRAIL:**

May 7, 2018

Section 805 is expanded as follows:

**A. GENERAL**

Provide non-mow strip under guardrail as shown in the plans, in accordance with plan details, standard drawings 805-525-01 & 805-525-02, and these special provisions. Non-mow strips under guardrail shall only be placed where shown in the plans, specified in the RFP or as directed by the Engineer.

**B. CONSTRUCTION**

Place non-mow strips under guardrail where indicated on the plans, specified in the RFP or as directed by the Engineer. Refer to details provided in this special provision and standard drawings for typical limits of non-mow strip and requirements for leave out areas around guardrail posts.

Provide non-mow strip between the edge of pavement and the face of the guardrail when that distance is less than 20 feet.

Extend non-mow strip under guardrail to bridge end at locations where concrete approach slabs are used.

When at least one opening between parallel lines of guardrail is less than 20 feet wide, provide non-mow strip the entire area between the lines of guardrail.

When openings between parallel lines of guardrail are more than 20 feet wide, but obstructions such as bridge columns reduce the access between the guardrail and the obstruction to less than 20 feet and/or the distance between any two obstructions is less than 20 feet then provide non-mow strip for the area with any single point of access less than 20 feet wide.

When areas around obstructions have non-mow strips, no area should remain uncovered that will sustain plant life.

The top of non-mow strips shall be constructed to be flush with surrounding earth shoulders and slopes.

Damage to non-mow strips during subsequent construction, especially during driving of guardrail posts, should be minimized. Any damaged non-mow strip must be restored to its original line and grade to the satisfaction of the Engineer.
Supplemental Technical Specification for

MECHANICALLY STABILIZED EARTH (MSE) WALLS

SCDOT Designation: SC-M-713 (5/1/14)

This supplemental technical specification replaces Section 713 of the 2007 Standard Specifications for Highway Construction.

1. Description

This work consists of designing, furnishing materials, and constructing Mechanically Stabilized Earth (MSE) walls in accordance with these specifications and the Wall Manufacturer's recommendations, and in conformance with the lines, grades, designs, and dimensions shown in the Plans or established by the RCE. Provide MSE walls that are reinforced with galvanized steel or geosynthetics with exposed facings that are precast concrete panels, modular concrete blocks, welded wire mesh, or other facings as specified in the Plans or specifications. Design details for MSE wall structures such as type of wall facing (e.g., precast concrete panel, modular concrete block facing), loading conditions, leveling pad requirements, temporary surcharge retaining walls, and details for appurtenances are shown in the Plans or specified herein. MSE wall design includes supplying engineering calculations and Shop Plans. Furnishing materials includes all MSE wall components such as facing elements, leveling pad, soil reinforcement and attachment devices, MSE wall backfill, wall coping, and any other project specific materials such as structural frames or other materials needed to accommodate designing around obstructions in walls, drainage features, etc. MSE wall construction includes structural excavation including removing any obstructions for the MSE wall, constructing the concrete leveling pad, erecting the wall facing, placing and compacting reinforced backfill, installing soil reinforcements, installing a drainage system, installing coping, and installing other project specific items as required by the Plans, Shop Plans, special provisions, Wall Manufacturer's recommendations, etc.

The following terms are used in this specification for identification of various entities for which the Contractor is fully responsible:

<table>
<thead>
<tr>
<th>Term</th>
<th>Entity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wall Manufacturer</td>
<td>The entity contractually retained by the Contractor to provide materials and construction support services for an accepted MSE wall system.</td>
</tr>
<tr>
<td>Wall Designer</td>
<td>The entity contractually retained by the Contractor to provide design of an accepted MSE wall system. The Wall Designer may be a representative of the Wall Manufacturer.</td>
</tr>
<tr>
<td>Wall Subcontractor</td>
<td>Contractor or subcontractor providing construction services for an accepted MSE wall system.</td>
</tr>
</tbody>
</table>

Provide the Wall Designer with a complete set of project plans and specifications and ensure that the wall design is compatible with all other project features that can impact the design and construction of the wall. Have the Wall Subcontractor provide a field representative who, in the past three years, successfully installed at least four MSE retaining walls of heights, lengths and complexity similar to those shown in the Plans and meeting the tolerances specified. Submit Wall Subcontractor’s installation qualifications to the RCE. The Wall Subcontractor’s field representative may make field changes subject to the approval of the RCE. Design and long term durability remains the responsibility of the Contractor. Provide documentation of all changes in writing within 24 hours of the approved changes. Ensure that this written document bears the legible seal, date, and signature of the responsible civil engineer registered as a Professional Engineer in the State of South Carolina, who is representing the Wall Designer.
1.1 MSE Wall Submittals, Review, and Acceptance

Submit 8 sets of design calculations and 8 sets of Shop Plans for review in accordance with the requirements provided herein. Send Shop Plans for projects designed by the Department directly to the PSE. Send Shop Plans for projects designed for the Department by a design consultant directly to the design consultant. For Shop Plans sent to the PSE, send a copy of the transmittal letter to the BCE, the OMR, and the RCE. For Shop Plans sent directly to a design consultant, send a copy of the transmittal letter to the PSE, the BCE, the OMR, and the RCE. Obtain the necessary mailing information at the Preconstruction Conference. Submit the design calculations and Shop Plans a minimum of 30 days before the proposed date to begin work.

Acceptance of the MSE wall design will be based on a review of the design calculations and the Shop Plans for conformance with the Plans, specifications, and SCDOT standard design practices. Ensure that all calculations and Shop Plans bear the legible seal, date, and signature of the responsible civil engineer registered as a Professional Engineer in the State of South Carolina. The Contractor, the Wall Manufacturer, and the Wall Designer are solely responsible for the accuracy, completeness, and constructability of the submitted design before and after review. Do not begin fabrication of the MSE wall components until written acceptance of the design and Shop Plans is provided. The Regional Production Group (RPG) Structural Engineer will transmit the reviewed and accepted Shop Plans to the Contractor when the review is complete.

If the Contractor or the Wall Manufacturer is required to supplement or revise the design submittal in order to obtain acceptance of the MSE wall design or MSE wall Certification Package, the time allowances for acceptance may increase. No additional contract time will be given for any subsequent loss of construction time due to time delays caused by revisions, modifications, clarifications, or re-submittal of calculations or Shop Plans, or MSE wall Certification documentation that are not in conformance with the Plans and specifications.

Payment for MSE wall construction will not be made until the MSE wall material certifications and MSE wall reinforced backfill material tests have been reviewed and accepted by the OMR.

1.2 MSE Wall Design

1.2.1 Scope of Design

Consider MSE wall structures as gravity walls. The Department or its design consultant will be responsible for evaluating the external stability of permanent MSE wall structures, which consists of checking the global stability for deep-seated failures, sliding stability, eccentricity, settlement analysis, and bearing capacity. The external stability of the MSE wall structure, using appropriate resistance factors, is satisfied with the minimum base width required, $B_{req}$, that is specified in the Plans.

The Contractor and the Wall Designer are responsible for the internal stability and compound stability design of permanent MSE wall structures. Determine the required soil reinforcement length and strength, facing/soil reinforcement connection strength, and facing stability in accordance with the Plans and this specification. The Contractor and the Wall Designer are responsible for the design of temporary and permanent MSE wall facings and facing connections required during either standard MSE wall construction or during two-stage MSE wall construction, and for other project specific requirements (wall drainage systems, designs that allow obstructions within the reinforced soil mass, etc.) that are required to build the MSE wall structure. Ensure that the project specific design criteria provided in the Plans are used in developing the MSE wall design. If design criteria are not shown in the Plans, use the design criteria listed in Subsection 1.2.2. Do not allow the MSE wall bearing pressures to exceed the bearing capacities provided in the Plans. Prepare the Shop Plans using the MSE Wall Details provided in the Plans. Specify the minimum required wall face batter that is needed to build the wall to the required construction tolerances. A negative slope or batter (sloping outward from the face) will not be acceptable regardless of the wall tolerance achieved.
1.2.2 Design Methodology

Design permanent MSE walls and any miscellaneous structures or systems associated with the MSE walls (e.g., structural frames for obstructions, wall drainage, joints, two-stage MSE wall construction) in accordance with the following documents listed in order of precedence:

- SCDOT Special Provisions
- Design criteria/requirements provided in the Plans
- Supplemental Technical Specification for Mechanically Stabilized Earth (MSE) Walls
- SCDOT Geotechnical Design Manual (GDM), Latest Version including any updates
- AASHTO LRFD Bridge Design Specifications, Latest Edition with Latest Interim Revisions

In instances of conflict, the order of precedence provided above will govern. Designs based on a methodology other than that required by this specification will not be accepted.

Maximum reinforcement loads shall be calculated using the “Simplified Method” as presented in AASHTO. No other design method will be allowed.

In addition, the following specific design requirements apply:

- Design and detail base drains and back drains to collect and remove groundwater before it can enter the reinforced backfill of the MSE wall.

- For internal stability calculations, use acceleration values shown in the Plans.

- Provide a reinforcement coverage ratio of 1.0 for all continuous reinforcement layers such as sheet type reinforcement (e.g., geogrid).

- With the exception of the top two layers of reinforcement, provide a constant length of all reinforcement layers within a design section to form a uniform reinforced soil mass. Provide the top two layers of reinforcement with a length of reinforcement that is 5 feet longer than all other layers below. This is an attempt to reduce the potential for tension cracks to develop directly behind the reinforced zone.

- Ensure that any temporary MSE walls used for staging or retaining surcharges and that interface with the reinforced backfill of a permanent MSE wall are designed and detailed by the same Wall Designer and Wall Manufacturer responsible for the design of the permanent MSE wall. Include in the design of MSE walls a method to prevent reflective cracking at the top of the embankment that may occur at the interface between the two construction phases. This may be accomplished by constructing horizontal layers of soil reinforcement that cross the interface between both construction phases at various elevations along the temporary MSE wall face.
1.2.3 Design Calculations

Fully document the determination of all loading conditions and assumptions. Include in the calculations all load cases that exist during construction and at the end of construction for any surcharges, hydraulic conditions, live loads, combinations, and obstructions within the reinforced backfill.

For computer generated designs furnish verification, in accordance with the requirements of the SCDOT GDM that the computer program’s design methodology meets the requirements provided herein.

Provide hand calculations for any special designs where computer runs do not adequately model the structure. Provide in the design calculations a summary of the design computations that includes design section identification, location, wall geometry (height, backslope, etc.), loadings (traffic loading, hydrostatic, seismic, traffic barrier, etc.), governing design resistance factors and level where they occur, and any other pertinent information.

1.2.4 Shop Plans

Furnish the Shop Plans on size A plan sheets in accordance with Subsection 725.1.1 of the SCDOT Standard Specifications. Include the following information on the Shop Plans:

- Final pay quantities based on verified ground elevations;
- Horizontal and vertical alignment of each wall;
- Elevation sheet or sheets for each wall;
- Existing ground elevations that have been verified by the Contractor for each location;
- Proposed ground lines;
- Vertical bearing pressure exerted by the MSE wall structure relative to changes in wall height and soil reinforcement length;
- MSE wall profile elevation showing top of the leveling pad elevations, maximum bearing loads, top of wall elevation at a maximum interval of 25 feet, and at all slope changes, etc.;
- Typical cross-section or cross-sections showing the elevation relationship between ground conditions and proposed grades;
- General notes pertaining to design criteria and wall construction;
- Details of slip joints if required to prevent stresses due to anticipated settlement or at interfaces with other structures;
- Details of all joints indicating type, size, and manufacturer;
- Details of wall batter; Construct the MSE wall structure using a predetermined backward batter corresponding to the anticipated outward wall deflection due to the active soil pressures. Have the Wall Designer determine this backward batter and adjust during construction as needed to build the wall to the required construction tolerances. A negative slope or batter (sloping outward from the face) will not be acceptable regardless of the wall tolerance achieved.
- Shape, dimensions, and any structural design details of MSE wall facings;
- Details of the architectural or finish treatment supplied;
- Details of facing/reinforcement connections;
- The number, size, type, length, and details of the soil reinforcing elements in each design section;
- Details showing location and installation of geotextile fabric;
- Details of the leveling pad showing dimensions;
- Finishing details at the top of wall (e.g., panel coping, barrier, pavements);
- Details at miscellaneous obstructions (e.g., drainage structures, utility conduits, pipes) located within the reinforced backfill;
• Details at bridge foundation obstructions (including foundations to be installed with the current project);
• Wall Manufacturer details of internal drainage system required by the Wall Designer, or as required by the Plans;
• Limits of structure excavation;
• Dimensions of reinforced backfill required;
• Required backfill material properties;
• Reinforcing steel schedule and bending details; and
• Any additional details pertaining to coping, railing, temporary facing, and internal drainage, as required by the Plans.

1.2.4.1 Shop Plan Notes

Ensure that notes shown in the Shop Plans do not conflict with SCDOT specifications and standard practice unless the notes are more stringent.

1.2.4.2 Top of Wall Elevation

Obtain written approval by the RPG Structural Engineer to lower the top of wall elevations from that shown on the Plans. Ensure the top of the wall elevations allow for proper interfacing with barriers, copings, surface ditches, bridge abutments, etc. as shown in the Plans.

1.2.4.3 Leveling Pad

Obtain written approval by the RPG Structural Engineer to raise or lower the leveling pad elevations shown in the Plans. Ensure that the leveling pad elevations allow for the transverse and longitudinal drainage structures shown in the Plans. Detail all top of leveling pads the lower of: 2 feet below the finished grade at the wall face; below the Extreme Event scour elevation (3 feet min.) for streams adjacent to the wall face; or 2 feet below the bottom of any drainage features, utilities, or other structures adjacent to the wall face. Increase the minimum embedment depth if necessary due to bearing capacity, settlement, stability, erosion, or scour, and if utilities, ditches, or other structures are located adjacent to the wall. Make certain that the minimum embedment depths also meet the requirements shown below.

<table>
<thead>
<tr>
<th>Slope in Front of Wall</th>
<th>Minimum Embedment Depth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Horizontal or slopes flatter than 3H:1V (walls)</td>
<td>Wall Height/20</td>
</tr>
<tr>
<td>Horizontal or slopes flatter than 3H:1V (abutments)</td>
<td>Wall Height/10</td>
</tr>
<tr>
<td>3H:1V</td>
<td>Wall Height/10</td>
</tr>
<tr>
<td>2H:1V</td>
<td>Wall Height/7</td>
</tr>
<tr>
<td>1.5H:1V</td>
<td>Wall Height/5</td>
</tr>
</tbody>
</table>

These requirements are based on local bearing capacity considerations taking into account the geometry in front of the wall.

1.2.4.4 Wall Interface and Vertical Joint Details

Where an MSE wall interfaces with another wall (MSE wall, concrete barrier wall, wing wall, etc.), ensure that the Shop Plans contain slip joint details, special facing element details, details on how to end the wall or walls, and how to compact the embankment at these locations. Do not place the end of any MSE wall over any non-yielding foundations. All vertical joint lines shall be detailed in a manner to ensure
that, for the life of the structure, the reinforced backfill does not migrate outside of the MSE wall system and the vertical joint is not wider than 1 inch. At locations where an MSE wall makes a 90 degree turn, use corner elements or corner blocks to make the turns. Show a detailed soil reinforcement layout where walls intersect (e.g., permanent MSE wall intersects a temporary MSE wall at 90 degrees or less).

1.2.4.5 Earth Surcharges

If the Plans indicate an earth surcharge is to be placed over the reinforced zone, the surcharge may be retained by using a temporary MSE wall structure. If a two-stage wall construction method is being used, construct the surcharge as part of the first stage (temporary face) of the permanent wall and adjust as indicated in the Plans or as directed by the RCE.

1.2.4.6 Precast Concrete Panel Facing Layout

For MSE walls with precast concrete panel facing, provide a numbered panel layout drawing for fabrication and erection purposes.

2. Materials

2.1 MSE Wall Facings

Purchase or manufacture all applicable materials such as facing panel, facing block, connectors, facing aggregate, block fill, welded wire mesh baskets, and all other necessary components and install as per project requirements.

2.2 MSE Wall With Precast Concrete Panel Facings

2.2.1 Precast Concrete Panel Facing

Provide precast concrete panels that are designed in accordance with Section 5 of the AASHTO LRFD Bridge Design Specifications, with the exceptions and additions listed in Subsections 2.2.1.1 through 2.2.1.10.

2.2.1.1 Size

Provide precast concrete panels that have a maximum width (w) to height (h) ratio, w/h, that is less than or equal to 1.20 and that have a maximum height (h) to width (w) ratio, h/w, that is less than or equal to 1.20. Ensure that the maximum surface area of the panel does not exceed 30 square feet. The ratios do not apply to the top and bottom rows where smaller panels may be used.

2.2.1.2 Reinforcing Steel

Provide reinforcing steel that meets the requirements of Section 703 of the SCDOT Standard Specifications. Ensure that fabrication and placement of reinforcing steel conforms to the applicable requirements of Section 703. Submit a manufacturer’s certification to the RCE that the reinforcing steel used in the facing panels is in conformance with this specification.

2.2.1.3 Concrete

Make certain that concrete and admixtures meet the requirements of applicable subsections of Section 701 of the SCDOT Standard Specifications, except that a third party certification will be required from either ACPA or NPCA. Details of certification programs offered by ACPA are found at www.concrete-pipe.org and NPCA at www.precast.org. Provide concrete conforming to the requirements of Class 4000P with a minimum 28-day compressive strength of 4,000 psi. Provide leveling pad concrete conforming to the requirements of Class 2500 with a minimum 28-day compressive strength of 2,500 psi.
2.2.1.4 Casting

Notify the SME at least 14 days before the production of precast concrete panels. Cast the panels on a flat surface, with the front face of the panel facing downward and the back face of the panel facing upward. Do not allow the tie strip guide or other galvanized devices to be in contact with or be attached to the face panel reinforcing steel.

Place the concrete in each panel without interruption and consolidate by the use of an approved vibrator, supplemented by such hand tamping as may be necessary to force the concrete into the corners of the form. Fully support the units until the concrete reaches a minimum compressive strength of 1,000 psi. Cure the panels with burlap for 36 hours or steam cure. Keep the forms in place until they can be removed without damage to the panel. The panels may be shipped 3 days after casting and attainment of the required concrete compressive strength of 4,000 psi.

2.2.1.5 Compressive Strength

Acceptance of the precast concrete panels with respect to compressive strength will be determined on a lot basis. A lot is defined as either 40 panels or a single day’s production, whichever is less. Randomly sample the lot for compressive strength testing in accordance with AASHTO T 141 and test in accordance with AASHTO T 22. Perform strength testing and acceptance in accordance with the applicable subsections of Section 701 of the SCDOT Standard Specifications. Reject panels represented by test cylinders that do not reach the above requirements. Submit testing results and a manufacturer’s certification to the RCE that the concrete used in the wall panels is in conformance with these specifications.

2.2.1.6 Markings

Clearly scribe the date of manufacture, the production lot number, and the panel identification number on the rear face of each panel.

2.2.1.7 Finish

Unless otherwise indicated in the Plans or directed by the RCE, ensure that the concrete surfacing for the front face has a deep fractured fin finish in accordance with Standard Drawing 701-950-01. Make certain all concrete finishes conform to the requirements of the applicable subsections of Section 702 of the SCDOT Standard Specifications. Provide the rear face with a uniform surface finish. Ensure that the rear face of the panel is roughly screeded to eliminate open pockets of aggregate and surface distortions in excess of 1/4 inch.

2.2.1.8 Tolerances

Manufacture precast concrete panels within the following tolerances:

- Panel Dimensions: Position panel connection devices to within 1 inch of the specified dimension. Ensure that all other dimensions are within 3/16 inch of the specified dimension.

- Panel Squareness: Ensure that the difference between the two diagonals does not exceed 1/2 inch.

- Panel Surface Finish: Ensure that surface defects on smooth formed surfaces measured over a length of 5 feet does not exceed 1/8 inch. Ensure that surface defects on the textured-finish surfaces measured over a length of 5 feet does not exceed 5/16 inch.
2.2.1.9 Rejection

Panels will be rejected because of failure to meet any of the requirements specified above. In addition, any of the following defects are sufficient cause for rejection:

- Defects that indicate imperfect molding.
- Defects indicating honeycomb or open texture concrete.
- Cracked or severely chipped panels.
- Color variation on front face of panel due to excess form oil or other reasons.
- Defective or damaged reinforcement connection devices.

2.2.1.10 Handling, Storage and Shipping

Handle, store, and ship panels in such a manner as to eliminate the dangers of chipping, discoloration, cracks, fractures, and excessive bending stresses. Support panels in storage on firm blocking located immediately adjacent to tie strips to avoid bending the tie strips.

2.2.2 Panel Joint Material

Install bearing pads of the dimensions and thickness shown in the Plans or the accepted Shop Plans. Ensure that bearing pads placed in horizontal joints between panels are preformed Ethylene Propylene Diene Monomer (EPDM) rubber pads. Supply a manufacturer's certification to the RCE that the bearing pad material conforms to ASTM D 2000 Grade 2, Type A, Class A with a Durometer Hardness of 55±5, or High Density Polyethylene (HDPE) pads with a minimum density of 0.946 g/cm³ in accordance with ASTM D 1505.

Determine the stiffness (axial and lateral), size, and number of bearing pads such that the final joint opening shall be 3/4 ± 1/4 inch. Ensure the Wall Designer submits substantiating calculations verifying the stiffness (axial and lateral), size, and numbering of bearing pads assuming, as a minimum, a vertical loading at a given joint equal to 2 times the weight of facing panels directly above that level. As part of the substantiating calculations, have the Wall Designer submit results of certified laboratory tests in the form of vertical load-vertical strain and vertical load-lateral strain curves for the specific bearing pads proposed by the Wall Designer. The vertical load-vertical strain curve should extend beyond the first yield point of the proposed bearing pad.

Cover all joints between panels on the back side of the wall with a geotextile meeting the requirements for filtration applications. Install the fabric cover in accordance with Subsection 4.5.

2.2.3 Panel Coping

Place a cast-in-place or precast concrete cap over the upper most level of the precast concrete panels as detailed in the Plans. For cast-in-place coping, use Class 4000 concrete conforming to the requirements of Section 701 of the SCDOT Standard Specifications. For precast concrete coping, use Class 4000P concrete conforming to the requirements of Section 701. If necessary, place concrete to level up the top row of MSE wall precast concrete panel facings prior to placing panel coping. Ensure the bottom of the coping is parallel to the finished grade and projects low enough to fully cover the stepped joint line between the leveling concrete and the top of the wall facing elements. For leveling concrete below precast concrete coping, use Class 3000 concrete conforming to the requirements of Section 701. Provide reinforcing steel that meets the requirements of Section 703 of the SCDOT Standard Specifications. Ensure that fabrication and placement of reinforcing steel conforms to the applicable requirements of Section 703. Submit a manufacturer's certification to the RCE that the concrete and reinforcing steel used in the panel coping are in conformance with these specifications. Locate all expansion and contraction joints to coincide with panel joints.
2.3 MSE Wall With Modular Concrete Block Facings

2.3.1 Modular Concrete Block Facing

Submit a manufacturer’s certification to the RCE that the modular concrete blocks for each lot shipped are in conformance with the following specifications. For each particular lot shipped, ensure that the certification for each shipment lists the date manufactured, type of block, the average compressive strength, and the water absorption.

2.3.1.1 Concrete

Use Portland Cement Concrete with a minimum 28 day compressive strength of 4,000 psi. Limit maximum water absorption to 5% in accordance with ASTM C 140. Ensure that admixtures conform to the requirements in applicable subsections of Section 701 of the SCDOT Standard Specifications.

2.3.1.2 Casting

Cast the modular concrete blocks in steel molds and in a manner that will ensure the production of uniform modular concrete blocks. Place the concrete in each block without interruption and consolidate. Steam cure the blocks for a minimum of 24 hours. Make certain the blocks reach a minimum compressive strength of 4,000 psi before being shipped.

2.3.1.3 Compressive Strength

Acceptance of the modular concrete blocks with respect to compressive strength is determined on a per lot basis. The maximum number of blocks in each lot is the lesser of 2,000 or a single day’s production. Randomly sample the lot in accordance with ASTM C 140. Have the Wall Manufacturer perform compressive strength tests on test specimens prepared by the manufacturer. Ensure that the compressive strength test specimens conform to the saw-cut coupon provisions of Subsection 5.2.4 of ASTM C 140. Block lots will be approved when the average compressive strength is 4,000 psi of 3 test coupons and with no individual test having a compressive strength less than 3,500 psi. Block lots not reaching the above requirements will be rejected.

2.3.1.4 Markings

Clearly mark on each lot the date of manufacture, lot number, and type of block in accordance with the approved MSE wall Shop plans.

2.3.1.5 Finish

Unless otherwise indicated in the Plans or directed by the RCE, provide on the front face of the blocks a natural gray roughened surface (granite) finish in accordance with Standard Drawing 701-950-01.

2.3.1.6 Tolerances

Provide modular concrete blocks manufactured within the following tolerances:

- Ensure that the length and width of each individual block is within 1/8 inch of the specified dimension.
- Ensure that hollow units have a minimum wall thickness of 1-1/4 inch.
- Ensure that the height of each individual block is within 1/16 inch of the specified dimension.
- When a broken or fractured face is required, ensure that the horizontal dimension of the front face is within 1 inch of the theoretical dimension of the individual block shown in the Plans.
2.3.1.7 Rejection

Modular concrete blocks will be rejected because of failure to meet any of the requirements specified above. In addition, any of the following defects will be sufficient cause for rejection:
- Defects that indicate imperfect molding.
- Defects indicating honeycomb or open texture concrete.
- Cracks greater than 0.02 inches in width and longer than 25% of the height of the block.
- Severely chipped or broken blocks.
- Color variation on front face of block due to excess form oil or other reasons.
- Defective or damaged reinforcement connection devices built into the modular concrete block.

2.3.1.8 Handling, Storage and Shipping

Handle, store, and ship modular concrete blocks in such a manner as to eliminate the dangers of chipping, discoloration, cracks, or fractures.

2.3.2 Block Fill

Furnish block fill in accordance with Subsection 2.5.4 when modular concrete blocks require a block fill for connection strength or when vertical void spaces exist within the modular concrete block.

2.3.3 Free Draining Aggregate

Provide a 12-inch thick free draining aggregate layer with a geotextile fabric when a granular backfill is used with modular concrete block facings. In addition to the 12-inch aggregate layer, fill any void spaces along the backside of the modular concrete blocks with aggregate.

2.3.4 Block Coping

Place a cast-in-place concrete coping over the upper most level of modular concrete blocks as indicated in the Plans or as shown on the accepted Shop Plans. Provide Class 4000 concrete conforming to applicable subsections of Section 701 of the SCDOT Standard Specifications. Use reinforcing steel that meets the requirements of Section 703 of the SCDOT Standard Specifications. Ensure that fabrication and placement of reinforcing steel conforms to the applicable requirements of Section 703. Submit a manufacturer’s certification to the RCE that the concrete and reinforcing steel used in the block coping are in conformance with these specifications.

2.4 MSE Wall Temporary Facing

2.4.1 Welded Wire Mesh Facing

Furnish reinforcing mesh that is shop-fabricated of cold drawn steel wire. Supply a manufacturer’s certification to the RCE that the material conforms to the requirements of AASHTO M 32, has been welded into the finished mesh fabric in accordance with the requirements of AASHTO M 55, and galvanization conforms to the minimum requirements of AASHTO M 111. Apply galvanization after the mesh is fabricated.

2.4.2 Temporary Facing Drainage Fabric

Provide the temporary geotextile drainage fabric as detailed in the Plans. Use geotextile meeting the requirements for filtration applications.
2.5 Reinforced Backfill Material

2.5.1 General

Provide either granular or stone backfill for the reinforced backfill material for permanent MSE walls. Use material free of shale, organic matter, mica, gypsum, smectite, montmorillonite, or other soft, poor durability particles. Use material free of salvaged material such as asphaltic concrete millings, Portland Cement Concrete rubble, etc. Ensure that the granular and stone backfills conform to applicable subsections of Section 205 of the SCDOT Standard Specifications with the engineering properties and material requirements in Subsections 2.5.2 through 2.5.8.

2.5.2 Granular Backfill

Ensure that the internal friction angle (Φ) for the reinforced granular backfill is not less than 32 degrees. Use a total unit weight of 120 pcf and a friction angle of 32 degrees for design purposes, unless otherwise indicated in the MSE wall design criteria shown in the Plans. Do not use an internal friction angle greater than 36 degrees for design of the MSE wall regardless of project specific testing. Use a granular backfill material with a gradation in accordance with the following table.

| Reinforced Granular Backfill Gradation (AASHTO T 27) |
|---------------------------------|-----------------|
| Sieve Size                      | Percent Passing |
| Extensible Reinforcement (geosynthetic) = 3/4", Inextensible Reinforcement (steel) = 1 1/2" | 100 |
| No. 40                          | 0 – 60          |
| No. 200                         | 0 – 15          |

2.5.3 Stone Backfill

Use a total unit weight of 110 pcf and a friction angle no greater than 38 degrees for design purposes, unless otherwise indicated in the MSE wall design criteria shown in the Plans. Do not use an internal friction angle greater than 38 degrees for design of the MSE wall regardless of project specific testing. For stone backfill material, use a coarse aggregate in accordance with the following table and obtained from a source listed on SCDOT Qualified Product List 2.

<table>
<thead>
<tr>
<th>Reinforced Stone Backfill</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soil Reinforcement Type</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Extensible Reinforcement (geosynthetic)</td>
</tr>
<tr>
<td>Inextensible Reinforcement (steel)</td>
</tr>
</tbody>
</table>

*Macadam is not permitted if wall can be inundated with water (see Plans)

2.5.4 Block Fill

Use coarse aggregate No. 67 or No. 6M obtained from a source listed on SCDOT Qualified Product List 2.

2.5.5 Free Draining Aggregate

Use coarse aggregate No. 67 or No. 6M obtained from a source listed on SCDOT Qualified Product List 2.
2.5.6 Soil Property Requirements For Backfill

Ensure that all reinforced backfill (granular or stone), block fill, and free draining aggregate have the following soil properties:

- pH values between 5.0 and 10.0 for metallic reinforcements, pH values between 3.0 and 9.0 for polyester, and pH values greater than 3.0 for polypropylene and high density polyethylene. For granular backfill, determine pH values in accordance with AASHTO T 289. For stone backfill, prepare sample as follows: Obtain approximately 2-1/2 pounds of representative material. Transfer the sample into a 1 gallon wide mouth plastic jug. Add an equal weight of deionized or distilled water to the sample and let the mixture sit for approximately 30 minutes. At the end of this period, place a lid on the container and vigorously agitate the mixture for 3 minutes. Repeat agitation 2 hours after the initial agitation and again 4 hours after the initial agitation. After the agitation at the 4-hour time interval, allow the sample to sit for approximately 20 hours to allow for any solids to settle out. After the sample sits for 20 hours, remove a sufficient amount of the solution and filter through a coarse paper (such as Fisher Q8) to obtain the supernate to be analyzed. Analyze the supernate according to ASTM D 1293 and ASTM D 1125.

- Organic content not to exceed 1.0 percent (weight of organic material to weight of total sample) as determined by AASHTO T 267 for material finer than No. 10 sieve.

- Internal friction angle not less than the values specified in Subsections 2.5.2 and 2.5.3 as determined by the standard direct shear test (AASHTO T 236) or the triaxial test (AASHTO T 297) on the portion passing the No. 10 sieve. Compact material test samples to 95% (AASHTO T 99, Method C or D) of maximum density at optimum moisture content. Internal friction angle testing of backfills meeting the requirements of Subsection 2.5.3 (Stone Backfill) is not required.

- The reinforced backfill material shall have a soundness loss of 30 percent or less when tested in accordance with AASHTO T 104 using magnesium sulfate solution with a test duration of four cycles. Alternatively, the material shall have a soundness loss of 15 percent or less when tested in accordance with AASHTO T 104 using a sodium sulfate solution with a test duration of five cycles.

- For granular material, Coefficient of uniformity, $C_u$, that is greater than 4 but less than 20. Compute the coefficient of uniformity, $C_u$, as follows:

$$C_u = \frac{D_{60}}{D_{10}}$$

Where: $D_{60}$ is the particle diameter at 60% passing and $D_{10}$ is the particle diameter at 10% passing.

- Plasticity Index (PI) less than or equal to 6 and the Liquid Limit (LL) less than or equal to 30 as determined by AASHTO T 90.

- Classified as well-graded in accordance with the Unified Soil Classification System (USCS) in ASTM D 2487. The reinforced backfill material shall not be gap-graded.

- If metallic soil reinforcements are used, the resistivity of the reinforced backfill and modular concrete block fill shall be greater than or equal to 5,000 ohm-cm (AASHTO T 288).
2.5.7 Temporary MSE Wall Reinforced Backfill

For a temporary MSE wall that interfaces with the reinforced backfill of a permanent MSE wall, use the same type of reinforced backfill that is used in the permanent MSE wall.

2.5.8 Testing Frequency

Test soil properties during initial source evaluation or if a change in source. Sample reinforced backfill material once every 2,000 cubic yards and test for gradation and pH. Sample reinforced backfill material once every 15,000 cubic yards and test for internal friction angle, organic content, and resistivity. A variation in testing frequency may be required if a variation in material gradation or composition is observed.

2.6 Soil Reinforcements and Attachment Devices

2.6.1 General

Purchase or manufacture all applicable materials such as soil reinforcements, attachment devices, and all other necessary components.

2.6.2 Inextensible Soil Reinforcement

2.6.2.1 General

Make certain inextensible reinforcement conforms to the required shape and dimensions and is free of defects that may impair its strength and durability. Provide a mill test report to the RCE with each shipment. Sample and test reinforcement from each heat number. Ensure minimum galvanization coating of 2.0 oz/sq.ft. Submit a signed certification to the RCE that all inextensible soil reinforcement is in conformance with these specifications.

2.6.2.2 Reinforcing Steel Strips

Provide galvanized reinforcing strips that are hot rolled from bars to the required shape and dimensions. Ensure that their physical and mechanical properties conform to ASTM A 572, Grade 65 minimum. Ensure galvanization conforms to the requirements of AASHTO M 111.

2.6.2.3 Metallic Reinforcing Mesh

Provide galvanized reinforcing mesh that is shop-fabricated of cold drawn steel wire conforming to the requirements of AASHTO M 32, and welded into the finish mesh fabric in accordance with AASHTO M 55. Apply galvanization after the mesh is fabricated, and ensure that it conforms to the requirements of AASHTO M 111.

2.6.2.4 Bar Mats

Fabricate bar mats from AASHTO M 270, Grade 36 steel. Apply galvanization after the bar mats and connector pins have been welded. Ensure that galvanization conforms to the requirements of AASHTO M 111 or M 232 as applicable.

2.6.2.5 Galvanization Damage

Repair damage done to the galvanization prior to the soil reinforcement installation in accordance with ASTM A 780.
2.6.3 Extensible Soil Reinforcement

2.6.3.1 General

Ensure that reinforcing conforms to the required shape and dimensions and is free of defects that may impair its strength and durability.

2.6.3.2 Geosynthetic Soil Reinforcement

Use geosynthetic soil reinforcement meeting the design requirements shown in the Plans and specified in the Shop Plans. Ensure that geotextile reinforcement is a woven geotextile consisting only of long chain polymeric filaments or yarns formed into a stable network. Ensure that geogrid reinforcements are a regular network of integrally connected polymer tensile elements with aperture geometry sufficient to permit significant mechanical interlock with the surrounding backfill material. Provide geosynthetic reinforcements having a structure that is dimensionally stable and able to retain its geometry under construction stresses and that have high resistance to damage during construction, to ultraviolet degradation, and to all forms of chemical and biological degradation encountered in the soil being reinforced.

2.6.3.3 Delivery, Storage, and Handling of Geosynthetic Materials

Check the geosynthetic soil reinforcement upon delivery to ensure that the proper material has been received. Make certain that geosynthetic rolls are labeled per ASTM D 4873. During all periods of shipment and storage, protect the geosynthetic materials from temperatures greater than 140°F, mud, dirt, dust, and debris. Follow the manufacturer's recommendations regarding protection from direct sunlight.

At the time of installation, the geosynthetic material will be rejected if it has defects, tears, punctures, flaws, deterioration, or damage incurred during manufacturing, transportation, or storage. At no additional cost to the Department, replace any geotextile fabric or geosynthetic reinforcement damaged during storage or installation.

2.6.3.4 Manufacturing Quality Control

Submit to the RCE a manufacturing quality control certificate and conformance testing results for all geosynthetic soil reinforcement delivered to the site. Perform sampling and conformance testing in accordance with ASTM D 4354. Base geosynthetic product acceptance on ASTM D 4759. For all geosynthetic soil reinforcement, provide conformance testing of ultimate tensile strength, T\text{ult}, in accordance with Subsection 2.7. Ensure that the quality control certificate includes roll numbers and identification, sampling procedures, and results of the conformance testing with a description of test methods used. Include a signed certification to the RCE that all extensible soil reinforcement is in conformance with these specifications with the submitted quality control certificate.

2.6.4 Reinforcement Attachment Devices

2.6.4.1 General

Make certain all reinforcing attachment devices conform to the required shape and dimensions and are free of defects that may impair their strength, durability, and functionality. Submit a manufacturer's certification to the RCE that the materials are in conformance with this specification.

2.6.4.2 Tie Strips

Provide tie strips that are shop fabricated of hot-rolled steel conforming to the requirements of ASTM A 1011, Grade 50 minimum. Use a bending radius that is greater than or equal to 3/8 inch. Apply galvanization after the strips are fabricated, inclusive of punch holes for bolts. Galvanization shall conform to the requirements of AASHTO M 111.
2.6.4.3 Fasteners

Furnish connection hardware conforming to the requirements shown in the approved Shop Plans. Cast connection hardware in the precast concrete panels such that all connectors are in alignment and able to transfer full and even load to the soil reinforcement. Ensure fasteners consist of hexagonal cap screw bolts and nuts conforming to the requirements of ASTM A 325, ASTM A 449, or equal. Galvanize in accordance with AASHTO M 232.

2.6.4.4 Connector Pins

Fabricate connector pins from AASHTO M 270, Grade 36, steel and weld to the soil reinforcement mats as shown on the Shop Plans. Galvanize in accordance with AASHTO M 111. Fabricate connector bars from cold drawn steel wire conforming to the requirements of AASHTO M 32 and galvanize in accordance with AASHTO M 111.

2.6.4.5 Turn-Buckle Connectors

For permanent walls that are indicated in the Plans to be constructed using two-stage construction methods, provide connection hardware conforming to the requirements shown in the approved Shop Plans. Determine the size and type of the turn-buckles and the number of connectors considering the facing panel size, distance between the two facing units, the type of infill used, and the amount of relative settlement anticipated between the two facing systems after the second stage facing is constructed. Cast connection hardware in the precast concrete panels such that all connectors are in alignment and able to transfer full and even load to the soil reinforcement. Ensure fasteners consist of hexagonal cap screw bolts and nuts conforming to the requirements of ASTM A 325, ASTM A 449, or equal. Galvanize in accordance with AASHTO M 232.

2.7 MSE Wall System Certification Package

2.7.1 Geosynthetic Soil Reinforcements

When geosynthetic soil reinforcements are used for construction of MSE walls, submit to the RCE an MSE Wall System Certification Package prepared by the Wall Manufacturer. This Certification Package is for the MSE wall system. Other Certification requirements for individual components of the MSE wall are included in other sections of these specifications. Include a statement in the MSE Wall System Certification Package that the furnished geosynthetic and the connection between the geosynthetic and the wall facing meets the design requirements as stated on the approved Shop Plans. Perform any tests required at no additional cost to the Department and in conformance with the testing requirements found in FHWA-NHI-10-025, “Design and Construction of Mechanically Stabilized Earth Walls and Reinforced Soil Slopes – Volume II”, 2009. If in the opinion of the Department, the required documentation is not provided for individual reduction factors (RF) or pullout coefficients (F*, α), use default values for these design parameters in accordance with this specification. Include in the MSE Wall System Certification Package a Certificate of Compliance that certifies the following (as applicable to the MSE wall system):

- The nominal long-term reinforcement design strength, \( T_{al} \), for geosynthetic soil reinforcements.
- The ultimate tensile strength, \( T_{ult} \), (Minimum Average Roll Value-MARV) for geosynthetic soil reinforcements.
- The strength reduction factors, \( CR_{CR} \) and \( RF_D \), for the long-term connection strength between geosynthetic soil reinforcement and modular block facing.
- The strength reduction factors, \( RF_{ID} \), \( RF_{CR} \), and \( RF_D \), for the long-term geosynthetic soil reinforcement tensile strength.

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• The geosynthetic’s pullout coefficients, $F^*$ and $\alpha$, meet or exceed the MSE wall's required design pullout coefficients.

Document that the certified values for the items above meet the minimum requirements outlined in Article 11.10 of AASHTO LRFD Bridge Design Specifications.

2.7.2 Metallic Soil Reinforcements

When metallic soil reinforcements are used for construction of MSE walls, submit to the RCE an MSE Wall System Certification Package prepared by the Wall Manufacturer. This Certification Package is for the MSE wall system. Other Certification requirements for individual components of the MSE wall are included in other sections of these specifications. Include in the certification a mill test report containing the ultimate tensile strength for the soil reinforcement. Also include a mill test report containing the galvanization coverage. For metallic mesh wall reinforcement, include a mill test report containing the ultimate weld strength for the soil reinforcement.

2.8 Miscellaneous Construction Materials

2.8.1 Leveling Pad

Construct an unreinforced cast-in-place concrete leveling pad as shown in the Plans using Class 2500 concrete conforming to the applicable requirements of Section 701 of the SCDOT Standard Specifications.

2.8.2 Geotextile for Drainage Filtration

Install geotextile for drainage filtration as shown in the Shop Plans. Provide a fabric that conforms to the requirements of AASHTO M 288. Submit to the RCE a manufacturer’s certification that the geotextile material is in conformance with AASHTO M 288.

2.8.3 Geomembrane

Place a single-layer continuous polymeric sheet as specified in the Plans. Glue or weld all seams in the membrane to prevent leakage. Use a geomembrane manufactured from a virgin polymeric resin. Make certain the geomembrane conforms to the requirements shown in the following table. Submit to the RCE a manufacturer’s certification that the materials are in conformance with the following table.

<table>
<thead>
<tr>
<th>Property</th>
<th>Test Method</th>
<th>Minimum Average Roll Value (MARV)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thickness, mills</td>
<td>ASTM D 5199</td>
<td>40</td>
</tr>
<tr>
<td>Tensile, lb/in.</td>
<td>ASTM D 882, 1 inch strip</td>
<td>70</td>
</tr>
<tr>
<td>Tear, lb.</td>
<td>ASTM D 1004, Die C</td>
<td>20</td>
</tr>
<tr>
<td>Puncture, lb.</td>
<td>ASTM D 4833</td>
<td>40</td>
</tr>
<tr>
<td>Impact, ft.-lb.</td>
<td>ASTM D 1424</td>
<td>25</td>
</tr>
</tbody>
</table>

3. Equipment

Ensure that the equipment necessary for the proper construction of the work is on site, is in acceptable working condition, and is acceptable to the RCE as to both type and condition before the start of work under this section. Provide sufficient equipment to enable prosecution of the work in accordance with the project schedule and completion of the work in the specified time.
4. Construction

4.1 Wall Excavation and Foundation Preparation

Prepare wall excavation and foundation in accordance with Section 204 of the SCDOT Standard Specifications. In addition to the requirements of Section 204, proof roll the area where the MSE wall will be constructed with a minimum of 5 passes by pneumatic tire equipment weighing a minimum of 8 tons.

4.2 Leveling Pad Construction

At each MSE wall foundation level, provide a cast-in-place unreinforced concrete leveling pad as shown in the Plans. Cure the leveling pad a minimum of 12 hours before placement of wall facing panels or blocks. If the permanent MSE wall facing is to be installed in front of a temporary MSE wall facing, install the leveling pad just prior to construction of the permanent MSE wall facing. Construct top surface of leveling pad so it is level in both directions. Reject leveling pad when top surface deviates from level by more than 1/8 inch in 10 feet, except at designated steps in the leveling pad shown on the Plans or accepted Shop Plans.

4.3 MSE Wall System Supplier's Assistance and Samples

Have the Wall Manufacturer and Wall Designer provide qualified and experienced advisory personnel at the start of the wall construction and until such time that the RCE believes the SCDOT inspectors and the Contractor's personnel are adequately acquainted with the MSE wall construction procedures and no longer require technical assistance. Ensure that the representatives are also available on an as needed basis, as requested by the RCE, throughout the construction of the MSE wall structures.

Provide the RCE with three MSE wall field installation manuals, specific to the MSE wall type being constructed. If the MSE wall is reinforced with geosynthetics, provide the RCE with two sets of samples (approx. 1 square foot each) of each type of geosynthetic soil reinforcement that will be used. Ensure that each sample has a durable tag attached to it, stating the geosynthetic manufacturer and type/model.

4.4 Internal Drainage System

Install an internal drainage system behind the wall as indicated in the Plans and Shop Plans. Place outlet pipes at sags in the flow line, at the low end of the collector pipe, and at other locations as shown or specified. Determine the location and elevation of the internal drainage system and include the details in the Shop Plans. Form openings for weep holes in precast facing panels prior to casting the panels.

4.5 Location of Geotextile Fabric

For MSE walls with precast concrete panel facings, provide a geotextile fabric covering all joints between panels on the backside of the wall, including the joint along the leveling pad. Make certain the geotextile fabric has a minimum width of 12 inches and overlaps adjacent geotextile fabrics a minimum of 4 inches. Adhere the geotextile fabric to the panels by applying adhesive to the back of the panel on each side of the joint. Do not apply adhesive directly on the geotextile fabric or within 2 inches of the panel joint edge.

For MSE walls with modular concrete block facings and granular reinforced backfill, place a geotextile between the free draining aggregate and the reinforced backfill. If a reinforced stone backfill is used, place the geotextile between the reinforced backfill and the retained backfill as shown in the Plans.

If required in the Plans, place geotextile fabric between the natural ground and the reinforced backfill. Ensure that the subgrade to receive the geotextile fabric is free of loose or extraneous material and sharp objects that may damage the geotextile fabric during installation. Stretch, align, and place the
geotextile fabric in a wrinkle-free manner and ensure that it has intimate contact with the soil. Overlap adjacent geotextile fabric edges a minimum of 1.5 feet.

At the direction of the RCE, repair or replace torn or punctured sections of the geotextile fabric. Cut out geotextile fabric damaged during installation by tearing or puncturing and completely replace or repair by placing a piece of fabric that is large enough to cover the damaged area. Provide a sufficient overlap, 1.5 feet minimum, on all sides to secure the damaged geotextile fabric area.

### 4.6 Wall Erection

Place precast concrete panels and modular concrete block facings so that their final position is vertical or battered as shown in the Shop Plans. Place precast concrete panels and modular concrete block facings in successive horizontal lifts. Construct the MSE wall structure using a predetermined backward batter corresponding to the anticipated outward wall deflection due to the active soil pressures. Have the Wall Designer determine this backward batter, show it on the Shop Plans, and adjust during construction as needed to build the wall to the required construction tolerances. A negative slope or batter (sloping outward from the face) will not be acceptable regardless of the wall tolerance achieved.

Handle MSE wall precast concrete panels by a lifting device set into the upper edge of the panels or as indicated in the Shop Plans. Place the first level of precast concrete panels directly on the concrete leveling pad. Do not use horizontal joint material or wooden shims between the first course of panels and the leveling pad. Provide external bracing for the first lift of precast concrete panels. As backfill material is placed behind a panel, maintain the panel in position by means of temporary wooden wedges or bracing in accordance with the MSE Wall Manufacturer’s recommendations. Remove the wooden wedges as soon as the panel above the wedged panel is completely erected and backfilled. Backfill in front of wall and above leveling pad to prevent erosion or ponding of water. Prevent water from standing adjacent to leveling pad.

For permanent walls that are indicated in the Plans to be constructed using two-stage construction methods, use the following construction sequence:

- Install settlement monitoring instrumentation in accordance with the Plans prior to commencement of two-stage MSE wall construction.

- Construct the MSE wall with temporary welded wire mesh facing as indicated in the Plans to allow for settlement to occur. Locate welded wire mesh facing to allow construction of the second stage of the permanent MSE wall facing.

- After the RCE in consultation with the RPG Geotechnical Engineer has determined sufficient settlement has occurred, the Department will provide written notice to proceed with the construction of permanent facing.

- Construct the MSE wall leveling pad at the location of the permanent wall facing.

- Place the permanent wall facing and attach connections to the soil reinforcement as indicated in the MSE wall details included in the accepted Shop Plans.

- As the permanent facing is being placed, backfill the space between the temporary and the permanent facings.

- Backfill in front of wall and above leveling pad to prevent erosion or ponding of water. Prevent water from standing adjacent to leveling pad.
4.7 Joint Material

Install joint material to the dimensions and thickness shown in the Plans, or the accepted Shop Plans.

4.8 Reinforced Backfill Placement

Closely follow the erection of each lift of facing elements with the backfill placement. At each level of soil reinforcement, roughly level the backfill material to an elevation approximately 1-2 inches above the level of the connection at the facing before placing the soil reinforcement. Place backfill in such a manner as to avoid any damage or disturbance of the wall materials. Remove and replace, at the Contractor’s expense, all wall materials that become damaged during backfill placement. Make certain that the backfill placement methods near the facing do not create voids directly beneath the reinforcing elements.

Construct the reinforced embankment in accordance with applicable subsections of Section 205 of the SCDOT Standard Specifications. Compact reinforced backfill to meet the design requirements but not less than 95.0 percent of the maximum dry density in accordance with AASHTO T 99. Perform compaction control testing of the reinforced backfill with a minimum frequency of one density test per every two lifts for every 25 feet of wall at bridge abutments (any portion of wall within 150 feet of a bridge) and every 100 feet of wall along roadways (more than 150 feet away from a bridge).

Compact stone backfill material with a minimum of 4 passes with a smooth heavy roller (approximately 15 tons). Compaction testing will not be required for stone backfill material. Do not use sheepfoot or grid-type rollers for compacting backfill within the reinforced backfill.

Achieve compaction within 3 feet of the back face of the wall, pipe encased pile, or pile, by at least three passes of a lightweight walk behind vibratory plate or roller. In order to determine the number of passes needed to compact the area within 3 feet of the back face of the wall, establish a test strip area 3 feet or farther from the back face of the wall, measuring a minimum of 3 feet by 5 feet within the reinforced backfill and compact it with a lightweight walk behind vibratory plate or roller. Ensure that the moisture content of the backfill material prior to and during compaction is uniformly distributed throughout each layer. Place stone backfill in 6 inch lifts within 3 feet of the back face of the wall and compact by at least four passes of a lightweight walk behind vibratory plate or roller.

Ensure that the backfill materials have a placement moisture content not more than 2 percentage points below the optimum moisture content and not more than the optimum moisture content. Remove and rework backfill material with placement moisture content in excess of the optimum moisture content until the moisture content is uniformly acceptable throughout the entire lift.

Make certain the maximum soil lift thickness (loose) is 8 inches and closely follows the MSE wall facing erection. Place stone backfill in 6 inch to 12 inch lift thickness (loose). Decrease this lift thickness if necessary to obtain the required density. Accomplish backfill compaction without disturbance or distortion of the reinforcement. Maintain a minimum of 6 inches of backfill material at all times between the compaction equipment and the soil reinforcement.

At the end of each day’s operations, shape the last level of backfill to permit runoff of rainwater away from the wall face. In addition, do not allow surface runoff from adjacent areas to enter the wall reinforcement zone until this zone is protected from infiltration. Repair any damage or movement caused by erosion, sloughing, or saturation of the reinforced backfill or retained backfill at no expense to the Department.
4.9 Soil Reinforcement Placement

4.9.1 General

Install the soil reinforcement in accordance with the Wall Manufacturer's recommendations and these specifications. Place the soil reinforcement within the layers of the compacted backfill material at the locations shown in the Shop Plans. Only place that amount of soil reinforcement required for immediately pending work to prevent undue damage. Place soil reinforcement with the strongest direction of soil reinforcement perpendicular to the wall face, unless otherwise shown in the Shop Plans. Connect the soil reinforcement to the MSE wall facing in accordance with the Wall Manufacturer’s recommendations. Next lay the soil reinforcement flat and uniformly tension it to remove any slack in the connection or soil reinforcement material. Once the reinforcement is connected to the panel, the amount of slack shall not exceed 1/8 inch between the connector and the reinforcement during field installation. Where wall geometry causes soil reinforcement to overlap, provide a minimum vertical separation of 3 inches between overlapping reinforcements.

4.9.2 Construction Tolerances

Erect walls with precast concrete panel facing units per the following requirements:

- Ensure vertical and horizontal alignment of the wall face does not vary by more than 3/4 inch when measured along a 10-foot straight edge, and along 3-foot straight edge for curved wall sections.
- The overall vertical plumbness tolerance (allowable variation from the offset batter shown on the Plans) from top to bottom of the wall is 1/2 inch per 10 feet of wall height. Ensure walls are constructed within tolerance. Wall acceptability related to plumbness will be determined after allowance is given for the offset batter of MSE wall facing. Negative batter is not acceptable.
- Make certain that the maximum allowable out of plane offset between panels at the joint does not exceed 3/8 inches. Ensure that the final horizontal and vertical joint opening is 3/4 ± 1/4 inch.

Erect walls with Modular concrete block facing units per the following requirements:

- Ensure vertical and horizontal alignment of the wall face does not vary by more than 3/4 inch when measured along a 10-foot straight edge, and along 3-foot straight edge for curved wall sections.
- The overall vertical plumbness tolerance (allowable variation from the offset batter shown on the Plans) from top to bottom of the wall is 1-1/4 inch per 10 feet of wall height. Ensure walls are constructed within tolerance. Wall acceptability related to plumbness will be determined after allowance is given for the offset batter of MSE wall facing. Negative batter is not acceptable.
- Level the first row of units from unit-to-unit and from front-to-back. Use the tail of the units for alignment and measurement.
- Lay all units snug or to within 1/16 inch together and parallel to the straight or curved line of the wall face.
- Dry-stack all blocks and place each block evenly spanning the joint in the row below (running bond). Shim or grind to control the elevations of any two adjacent blocks to within 1/16 inch.
- Check the top of blocks with a minimum length of 3 feet long straight edge bubble level. Grind high points identified by the straight edge. Check block front to back tilting frequently, and correct by shimming no later than after 3 completed courses.
Ensure that temporary MSE vertical and horizontal alignment construction tolerance for wall facing constructed with welded wire form and geosynthetic wrap or other approved temporary facing method does not exceed 2 inches when measured along a 10-foot straight edge. Negative batter is not acceptable.

4.10 Surcharge

Should the Plans indicate an earth surcharge to be placed over the reinforced zone, retain the surcharge using a temporary wall. The temporary wall may be built with a temporary MSE wall or other approved method. Place the face of the temporary surcharge wall approximately 1 foot from the permanent wall face. Ensure that the top surface of the surcharge allows the surface water to drain away from the wall. A geotextile separation fabric may be placed over the reinforced zone prior to placing the surcharge material.

4.11 Abutment Piling

If abutment piles are placed within the reinforced zone, case the piles through the reinforced backfill and adhere to the following requirements and sequence.

- Drive all piles within the reinforced zone prior to MSE wall construction.
- Encase each pile in a Smooth Wall or Corrugated Galvanized Steel (SWCGS) pipe of sufficient thickness to prevent buckling or distortion during placement and compaction of wall backfill. Include cost of encasement in the cost of the MSE wall.
- Externally stabilize the SWCGS pipe to prevent the pipe from coming in contact with the pile during backfilling of the wall.
- Extend the SWCGS pipe from the bottom of the backfill to 2 inches below the bottom of the bridge abutment cap.
- After positioning, seal the top of the SWCGS pipe to prevent debris accumulation during placement of wall backfill, and keep the pipe sealed until the pipe is filled with granular material.
- Unseal the pipe and fill the SWCGS pipe loosely with granular material after completion of wall construction to the satisfaction of the RCE.

5. Measurement

5.1 MSE Retaining Wall

The quantity for the pay item MSE Retaining Wall (of the type specified) is the area of the face of MSE wall constructed and is measured by the square foot (SF). The MSE Retaining Wall is measured vertically from the top of the leveling pad to the top of the wall as shown in the approved Shop Plans for the MSE wall profile, complete, and accepted. There will be no separate measurements for precast concrete panels, modular concrete blocks, temporary facing, galvanized steel reinforcing and tie strips or galvanized steel mesh and mesh connectors or geosynthetic reinforcement, geotextile fabric, geosynthetic membrane, bearing pads, leveling pad, perforated pipe, drain pipe, SWCGS pipe, or other incidental items required for construction of the MSE wall. Field revisions made to the length and/or height of the MSE wall from the specified dimensions on the shop plans for the convenience of the contractor will not be included in the plan quantity.
5.2 MSE Retaining Wall Backfill

The quantity for the pay item MSE Retaining Wall Backfill (of the specified material) is the volume of the material specified for permanent MSE walls and is measured by the cubic yard (CY) in-place, complete, and accepted. The volume is measured as follows:

The depth is measured between the bottom elevation of the coping and the elevation of the top of the leveling pad. The width is measured between the vertical planes located along the back of the MSE wall facing and 1 foot outside and parallel to the back end of the soil reinforcement at the leveling pad elevation as shown on the accepted Shop Plans. The length is measured from beginning to end of wall along the MSE wall stationing.

5.3 Coping

The quantity for the item Coping for MSE Retaining Wall (Roadway or Bridge) is the length of the cast-in-place or precast concrete coping and is measured by the linear foot (LF) along the length of the top of the wall in-place, complete, and accepted. There is no separate measurement for leveling concrete, dowels, grout, concrete, steel reinforcement, bearing pads, joint filler, or other incidental items required for construction of the coping. If no revisions are made to the length of the MSE wall from the specified dimensions on the Shop Plans, field measurement of the coping is not required and the quantity is the Shop Plan quantity.

5.4 Structure Excavation

When indicated in the plans for MSE walls, the quantity for the item Structure Excavation for Retaining Walls is the volume of material actually removed and is measured by the cubic yard (CY), complete, and accepted. The volume is measured as follows:

The depth is measured between the elevation of the original ground surface and the elevation of the top of the leveling pad. The width is measured between the vertical planes located 2 feet outside of and parallel to the front facing of the MSE wall located at the leveling pad and 3 feet outside and parallel to the back end of the soil reinforcement at the leveling pad elevation as shown on the accepted Shop Plans. The length is measured from beginning to end of wall along the MSE wall stationing. Material removed outside of this area is not included in the quantity, except where specifically authorized in writing by the RCE.

6. Payment

6.1 MSE Retaining Wall

Payment for the accepted quantity of MSE Retaining Wall (of the type specified), measured in accordance with Subsection 5.1, is determined using the contract unit bid price for the applicable pay item. Payment is full compensation for constructing MSE retaining walls as specified or directed and includes, but is not limited to, furnishing and installing precast concrete panels or modular concrete blocks, galvanized steel reinforcing and tie strips or galvanized steel mesh and mesh connectors or geosynthetic reinforcement, geotextile fabric, geosynthetic membrane, bearing pads, leveling pad, temporary facing, SWCGS pipe, and drainage systems (even when not shown on the Plans); material testing; and all other materials, labor, equipment, tools, supplies, transportation, and incidentals necessary to fulfill the requirements of the pay item in accordance with the Plans, the Specifications, and other terms of the Contract. When changes in the work are ordered by the RCE in writing which vary the square foot of MSE retaining wall quantity shown in the Shop Plans, quantities will be adjusted to reflect the field changes.
6.2 MSE Retaining Wall Backfill Material

Payment for the accepted quantity of MSE Retaining Wall Backfill (of the specified material), measured in accordance with Subsection 5.2, is determined using the contract unit bid price for the applicable pay item. Payment is full compensation for furnishing, placing, and compacting the specified backfill material as specified or directed and includes all other materials, labor, equipment, tools, supplies, transportation, and incidentals necessary to fulfill the requirements of the pay item in accordance with the Plans, the Specifications, and other terms of the Contract.

6.3 Coping

Payment for the accepted quantity of Coping for MSE Retaining Wall (Roadway or Bridge), measured in accordance with Subsection 5.3, is determined using the contract unit bid price for the applicable pay item. Payment is full compensation for constructing cast-in-place or precast concrete coping on top of the MSE retaining wall as specified or directed and includes furnishing and installing leveling concrete, dowels, grout, concrete, bearing pads, joint filler, steel reinforcement, all other materials, labor, equipment, tools, supplies, transportation, and incidentals necessary to fulfill the requirements of the pay item in accordance with the Plans, the Specifications, and other terms of the Contract.

6.4 Structure Excavation

Payment for the accepted quantity for Structure Excavation for Retaining Walls measured in accordance with Subsection 5.4, is full compensation for excavation of material necessary for the construction of retaining walls as specified or directed and includes removing and disposing of unsuitable material and backfilling with suitable material obtained from sources outside the limits of the roadway, and all other materials, labor, equipment, tools, supplies, transportation, and incidentals necessary to complete the work in accordance with the Plans, the Specifications, and other terms of the Contract.

6.5 Pay Items

Payment for each item includes all direct and indirect costs and expenses necessary to complete the work.

Pay items under this section include the following:

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SCDOT TRAFFIC SIGNALS

MATERIAL SPECIFICATIONS

Revised
5/16/2016
MATERIAL SPECIFICATION REVISIONS

NOTE: SCDOT has made note of revisions since the last set of specifications, however, it is the responsibility of the contractor/vendor to read the specifications and verify materials meet requirements. Do not rely solely on this revision sheet for specification changes.

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<td>CONTROLLER AND CABINET ASSEMBLY</td>
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<td>PEDESTRIAN PUSH BUTTON STATION ASSEMBLY WITH SIGN</td>
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<td>M686.1</td>
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<td>Removed Furnish Fiber Interconnect Center specification</td>
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<td>Revised Fiber Optic Cable specifications to be Industry Standards</td>
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# Traffic Signals

## Material Specifications

5/16/2016

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M677.1 ELECTRICAL CABLE

1.1 Description

This specification describes requirements for furnishing traffic signal, loop lead-in, pedestrian signal, and pedestrian push button Electrical Cable.

1.2 Materials

1.2.1 Black Cable

1.2.1.1 Traffic Signal Head Black 8 Conductor Wiring

BLACK - Unless specified elsewhere, the traffic signal cable shall be (8 conductor). The conductor shall be #14 AWG, 19 strands, bare copper. The conductor insulation shall be high density polyethylene and shall be both ultraviolet and weather resistant. The wall thickness for the single conductor shall be 0.025” minimum point thickness with a .124” nominal diameter. The Cabling overall lay shall be 6” with a left hand lay. 1 (60) Non-Hydroscopic Polypropylene filler material shall be utilized to produce a circular cross section. The conductor cable assembly shall be wrapped with a 0.001 inch clear Mylar tape material applied helically with a minimum 25% overlap. The overall cable assembly shall be provided with a black high density polyethylene jacket which is both ultraviolet and weather resistant. The wall thickness shall be 0.042 inch minimum point thickness. The cable shall have a nominal cabling diameter of .393” and a nominal jacket diameter of .487” and shall have a ripcord for easy jacket removal. The outer cable jacket shall have sequential foot marks. Traffic signal cable shall be manufactured in accordance with the requirements of Underwriters’ Laboratories, SCDOT, IMSA 20-1, ROHS, Federal specifications, and the National Electric Code.

The traffic signal cable must also meet or exceed specifications in the chart below.

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<th>Conductor Colors</th>
<th>Insulation Color</th>
<th>Size, AWG</th>
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<tr>
<td>Red w/Black Band, Green w/Black Band</td>
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</table>

1.2.1.2 Pedestrian Signal Head Black 4 conductor Wiring

BLACK - Unless specified elsewhere, the traffic signal cable shall be (4 conductor). The conductor shall be #14 AWG, 19 strands, bare copper. The conductor insulation shall be high density polyethylene and shall be both ultraviolet and weather resistant. The wall thickness for the single conductor shall be 0.025” minimum point thickness with a .124” nominal diameter. The Cabling overall lay shall be 4.50” left hand lay. 4 (60) Non-Hydroscopic Polypropylene filler material shall be utilized to produce a circular cross section. The conductor cable assembly shall be wrapped with a 0.001 inch clear Mylar tape material applied helically with a minimum 25% overlap. The overall cable assembly shall be provided with a black high density polyethylene jacket which is both ultraviolet and weather resistant. The wall thickness shall be 0.045 inch minimum point thickness. The cable shall have a nominal cabling diameter of .296” and a nominal jacket diameter of .373” and shall have a ripcord for easy jacket removal. The outer cable jacket shall have sequential foot marks. Traffic signal cable shall be manufactured in...
accordance with the requirements of Underwriters’ Laboratories, SCDOT, IMSA 20-1, ROHS, Federal specifications, and the National Electric Code. The traffic signal cable must also meet or exceed specifications in the chart below.

### Conductor Insulation

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<th>Conductor Colors</th>
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#### 1.2.2 Gray Cable

**1.2.2.1 Loop lead-in Gray 4 Pair Wiring**

GRAY - Unless specified elsewhere, the loop lead-in cable shall be four individually shielded pairs (8 conductor). Each pair shall be individually twisted (two turns per foot minimum). The conductor shall be #14 AWG, 19 strands, bare copper. The conductor insulation shall be high density polyethylene and shall be both ultraviolet and weather resistant. The nominal insulation thickness shall be 0.025”. The nominal insulation diameter shall be .134”. Each pair shall be wrapped with a 0.001 inch aluminum mylar foiled shield with a minimum 25% overlap. Aluminum is to be located on the outside. 4 (60) non-hygroscopic polypropylene filler material shall be utilized to produce a circular cross section. The cabling overall lay shall be a 5.50” left hand lay. The drain wire shall be #16 AWG, 19 strands, tinned copper. The conductor cable assembly shall be wrapped with a 0.001 inch clear Mylar binder applied helically with a minimum 25% overlap. The overall cable assembly shall be provided with a high density polyethylene jacket which is both ultraviolet and weather resistant. The nominal jacket thickness shall be 0.042”. The outer cable jacket shall have sequential foot marks. Traffic signal cable shall be manufactured in accordance with the requirements of SCDOT, IMSA 50-2, ROHS, and the National Electric Code.

The twisted pair loop lead-in cable must also meet or exceed specifications in the chart below.

### Conductor Insulation

<table>
<thead>
<tr>
<th>Pair Color</th>
<th>Insulation Color</th>
<th>Size, AWG</th>
</tr>
</thead>
<tbody>
<tr>
<td>White-Yellow</td>
<td>Gray</td>
<td>#14</td>
</tr>
<tr>
<td>Red-Green</td>
<td></td>
<td></td>
</tr>
<tr>
<td>White w/Black Band-Yellow w/Black Band</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Red w/Black Band-Green w/Black Band</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### 1.2.2.2 Pedestrian Push Button Gray 2 Pair Wiring

GRAY - Unless specified elsewhere, the loop lead-in cable shall be two individually shielded pairs (4 conductor). Each pair shall be individually twisted (two turns per foot minimum). The conductor shall be #14 AWG, 19 strands, bare copper. The conductor insulation shall be high density polyethylene and shall be both ultraviolet and weather resistant. The nominal insulation thickness shall be 0.025”. The nominal insulation diameter shall be .124”. Each pair shall be wrapped with a 0.001 inch aluminum mylar foiled shield with a minimum 25% overlap. Aluminum is to be located on the outside. 3 (60) non-hygroscopic polypropylene filler material shall be utilized to produce a circular cross section. The cabling overall lay shall be a 4.00” left hand lay. The drain wire shall be #16 AWG, 19 strands, tinned copper. The conductor cable assembly shall be wrapped with a 0.001 inch clear Mylar binder applied helically with a minimum 25% overlap. The overall cable assembly shall be provided with a high density polyethylene jacket which is both ultraviolet and weather resistant. Nominal Jacket diameter shall be...
0.40” and shall have a ripcord for easy jacket removal. Nominal Cabling Diameter shall be .335”. The nominal jacket thickness shall be 0.035”. The outer cable jacket shall have sequential foot marks. Traffic signal cable shall be manufactured in accordance with the requirements of SCDOT, IMSA 50-2, ROHS, and the National Electric Code.

The twisted pair loop lead-in cable must also meet or exceed specifications in the chart below.

<table>
<thead>
<tr>
<th>Pair Color</th>
<th>Insulation Color</th>
<th>Size, AWG</th>
</tr>
</thead>
<tbody>
<tr>
<td>White-Yellow</td>
<td>Gray</td>
<td>#14</td>
</tr>
<tr>
<td>Red-Green</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1.2.3 Certification

CATALOG CUTS ARE REQUIRED

1.2.4 Warranty

The Vendor shall furnish SCDOT with any warranties on equipment and materials that are provided by the Manufacturer or Vendor as normal trade practice.

1.2.5 Labeling and Delivery

Unless otherwise stated, the cable shall be supplied in minimum reels of 1,000 feet, for splice-free installation.

The Manufacturer shall be required to mark each cable and cable reel to facilitate easy identification of the various sizes when stored in stockpiles.

1.3 Measurement

Electrical Cable, of the size and numbers of conductors specified, shall be measured by LINEAR FEET and furnished in 1000’ reels.

1.4 Payment

Furnishing Electrical Cable, measured as provided above, will be paid at the contract unit price bid for:

<table>
<thead>
<tr>
<th>Description</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>FURNISH NO. 14 COPPER WIRE, 4 CONDUCTOR - BLACK</td>
<td>1000’ REEL</td>
</tr>
<tr>
<td>FURNISH NO. 14 COPPER WIRE, 2 PAIR CONDUCTOR - GRAY</td>
<td>1000’ REEL</td>
</tr>
<tr>
<td>FURNISH NO. 14 COPPER WIRE, 8 CONDUCTOR - BLACK</td>
<td>1000’ REEL</td>
</tr>
<tr>
<td>FURNISH NO. 14 COPPER WIRE, 4 PAIR CONDUCTOR - GRAY</td>
<td>1000’ REEL</td>
</tr>
</tbody>
</table>
1.1.1 Industry Standard

- The optical fiber cable plant consists of optical fiber cables, connectors, mounting panels, jumper cables, and other passive components, but it does not include active components.
- TIA-526-7 (OFSTP-7)-2002+A1:2008, Measurement of Optical Power Loss of Installed Single-Mode Fiber Cable Plant. This standard specifies singlemode optical loss measurement methods between two passively connected points using an optical source and power meter. An Optical Loss Test Set uses a light source to inject light in the fiber and a measurement device to measure the light out- this measures the attenuation (optical loss).
- Singlemode fiber (OS1, OS2) shall not have more than 0.5 dB attenuation (signal loss) per kilometer. That is measured with an Optical Loss Test Set.
- No more than 20% light loss will be accepted. Singlemode fiber (OS1, OS2, OSP) shall not have more than 0.5 dB attenuation (signal loss) per kilometer. That is measured with an Optical Loss Test Set.
- An OTDR is a good tool to “see” the overall “health” of the installed fiber OR to locate breaks, estimate connector and splice loss, identify macrobends (bends visible to the eye but hidden in the cable jacket) and microbends (a microbend could be caused if the fiber coating squeezes a fiber as it contracts at very low temperatures, ran over by a vehicle, or if it is stressed during installation). Both bends can result in increased attenuation that can degrade system performance and minimize optical throughput. Fusion or mechanical splices shall not have a loss of more than 0.3 dB. Mechanical splices are not SCDOT standard splice methodology. SCDOT allows Singlemode connector mating (patch cord to fiber interconnect center coupler) a max loss of 0.75 dB when planning and testing. The same loss is allowed from the patch cord to the Ethernet switch. Essentially signal loss of 0.75 dB is expected and allowed each time two factory connectors are mated. FYI- factory terminated patch cords have an average loss of 0.3 dB for factory-polished singlemode pigtails suitable for splicing.
- This standard includes an encircled flux launch condition metric (i.e. launch cable which allows the OTDR to settle down and analyze the true reflections of the installed cable, splices, and connectors) for measuring cable plant. Additionally, this standard includes the description of using an optical time domain reflectometer (OTDR) for total attenuation measurement and measurements of individual component loss.
- Outside Plant Cable OSP installation- The standard calls for water-blocked cables (cables suitable for outside plant use) with a minimum pulling tension of 600 pounds.
- Minimum bend radius is 20 times the cable diameter under max rated pulling tension and 10 times unloaded (unloaded means slack storing and permanently installed).
- ANSI/TIA/EIA-598-C–2005, Optical Fiber Cable Color Coding. This standard specifies the recommended identification for individual fibers, fiber units, and groups of fiber units within a cable structure (jacket).

1.1.2 Cable

- The cable shall meet all requirements stated in RUS-90 as well as those stated within this document. The cable shall be an accepted product of the United States Department of Agriculture Rural Utility Service as meeting the requirements of RUS-PE-90. The cable shall be new, unused, and of current design and manufacture.
- The single-mode fiber used in the cable shall conform to the following specifications:
  - Typical Core Diameter: 8.3 µm
  - Cladding Diameter: 125.0 + 1.0 µm by fiber end measurement
  - Core-to-Cladding Offset: < 1.0 µm
  - Cladding Non-Circularity: < 2.0% (Defined as: [1-(min. cladding dia. max. cladding dia.)] x 100)
  - Coating Diameter: 250 + 15 µm
  - Attenuation Uniformity: No point discontinuity greater than 0.1 dB at either 1300 nm or 1550 µm.

  - The change in attenuation at extreme operational temperatures for single-mode fibers shall not be greater than 0.40 dB/km at 1550 nm and 0.5 at 1310 nm, with 80% of the measured values no greater than 0.10 dB/km at 1550 nm.
  - The maximum dispersion shall + 3.3 ps/(nm • km) for 1285 nm through 1330 and shall be < 18 ps/(nm • km) at 1550 nm.

1.1.3 Fiber Characteristics

- All fibers in the cable shall be usable fibers and meet required industry standards.
- All optical fibers shall be sufficiently free of surface imperfections and inclusions to meet the optical, mechanical, and environmental requirements to this specification.
Each optical fiber shall consist of a doped silica core surrounded by a concentric silica cladding.
The coating shall be a dual-layered, UV cured acrylate applied by the fiber manufacturer. The coating shall be capable of being mechanically or chemically striped without damaging the fiber.

1.1.4 Cable Size and Configuration

The core or buffer tubes containing the fibers and the interstices between the buffer tubes, fillers, and strength members in the core structure are filled with a suitable material to exclude water. Fibers may be assembled in either loose tube fiber bundles or tight buffered configurations. Both construction types must pass all the requirements of current industry standards such as ICEA S-87-640, Telcordia GR-20-CORE and RUS PE-90.

Each loose tube configuration shall contain twelve (12) fibers. The fibers shall not adhere to the inside of the buffer tube.

Each fiber and loose tube buffer shall be distinguishable from each other by means of color coding according to ANSI/TIA/EIA-598-C–2005, Optical Fiber Cable Color Coding as referenced below. Tight buffered fibers shall adhere to the same color coding standards.

1. Blue
2. Orange
3. Green
4. Brown
5. Slate
6. White
7. Red
8. Black
9. Yellow
10. Violet
11. Rose
12. Aqua

Optical cable designs not specifically addressed by this section may be allowed if accepted by SCDOT. Justification for acceptance of a modified design must be provided to substantiate product utility and long term stability and endurance.
M677.6 FACTORY TERMINATED PATCH PANEL

1.1 Description

This specification describes requirements for furnishing a Factory Terminated Patch Panel. Included in this item is the splicing of the fiber optic cable; installing interconnection sleeves, jumpers, connectors and other hardware that may be needed for connecting the fiber optic cable to the signal system electronic devices.

1.2 Materials

1.2.1 Factory Terminated Patch Panel

The interconnect center shall be a factory terminated patch panel, including strain relief hardware and have termination/connection capacity for 12 fibers and a 200’ tail.

1.2.2 Certification

CATALOG CUTS ARE REQUIRED

1.2.3 Warranty

The Vendor shall furnish SCDOT with any warranties on equipment and materials that are provided by the Manufacturer or Vendor as normal trade practice.

1.3 Measurement

Furnishing a Factory Terminated Patch Panel will be measured by EACH.

1.4 Payment

The Factory Terminated Patch Panel, as measured above, will be paid for at the contract unit price bid for:

| FURNISH FACTORY TERMINATED PATCH PANEL | EA |
M678.1 FURNISH WIRE, SEALANT, AND/OR MATERIALS FOR DETECTOR LOOP

1.1 Description

This specification describes requirements for furnishing Wire, Sealant, and/or Materials for a Detector Loop.

1.2 Materials

1.2.1 Loop Wire

Loop wire shall be splice-free lengths of: No. 14 AWG, 19 Strands, single-conductor bare copper wire. The conductor insulation (BLACK or GRAY) shall be high density polyethylene and shall be both ultraviolet and weather resistant. The wall thickness shall be 0.030 inch minimum point thickness. Cable shall be manufacturer in accordance with the requirements of Underwriters Laboratories, Federal specifications, and the National Electric Code.

1.2.2 Sealant

The loop sealant used to fill the saw cuts and other gaps, shall be of a type intended for traffic loop embedding. The cured sealant shall be semi-flexible, and be capable of adhering securely to concrete, asphalt, wood, metal, etc. It shall be unaffected by freeze-thaw cycling, salts, gasoline, oil, sewerage and corrosive chemicals. It shall be proportioned and mixed per the manufacturer’s specifications. Acceptable sealants are listed on the SCDOT QPL.

1.2.3 Waterproofing Splice Materials

The splice at the "junction point" shall be made waterproof using the materials listed below:

a) Cable Splice Kit - Commercially available, Low-Voltage, water-proof Splice-kit; to be Plymouth "PLYFLEX"; or 3M "SCOTCH-LOK", Unipak #3570, Resin 400, (or approved equal). To be installed per manufacturer’s instructions.

b) Heat Shrink tubes
c) Gel Caps
d) Vinyl plastic electrical tape (use where required)-Cold and weather resistant, 19 mm (3/4 inch) wide, 1.8 mm (7 mil) thickness, (Scotch 33+ or approved equal). Shall use liquid electrical coating (where required) - Fast-drying sealant compatible with vinyl tape, brush-applied (3M, Scotchkote or approved equal).

1.2.4 Underwater Splicing Kit

Where shown on the Plans, in very wet areas an Underwater Splice Kit may be required at the "junction point". This splicing kit shall consist of a two-piece mold-body, with pourable resin sealing compound, funnels, and end sealing strips (3M, Scotchcast 82-A1 or approved equal).

1.2.5 Wire Crimps

The PREFERRED splicing method at the "junction point", shall use a commercial/industrial grade, copper-alloy CRIMP-ON, with one end closed, of a size proper for the gauge of wires to be spliced, and
the number of conductors. It shall be installed with butt splice using a T & B type crimping tool or similar tool, intended for the purpose (NOT regular pliers). (Note: wire-nuts are not acceptable.)

1.2.6 Solder

The alternate method of splicing at the "junction point" is to use SOLDER, which shall be electronic-grade, rosin-core, 60 lead/40 tin. Acid-core solder is not acceptable, nor are acid-type soldering pastes.

1.2.7 Certification

The Vendor shall provide details for the loop sealant, loop wire, and lead-in wire proposed.

CATALOG CUTS ARE REQUIRED
SAMPLE REQUIRED

1.2.8 Warranty

The Vendor shall furnish SCDOT with any warranties on equipment and materials that are provided by the Manufacturer or Vendor as normal trade practice.

1.3 Measurement

Wire for Detector Loops, of the size and numbers of conductors specified, shall be measured by LINEAR FEET and furnished in 5000’ reels.

1.4 Payment

Furnishing Wire for Detector Loops, measured as provided above, will be paid at the contract unit price bid for:

FURNISH NO. 14 COPPER WIRE, 1-CONDUCTOR FOR LOOP WIRE  5000’ REEL
M678.1 FURNISH WIRE, SEALANT, AND/OR MATERIALS FOR DETECTOR LOOP

1.1 Description

This specification describes requirements for furnishing Wire, Sealant, and/or Materials for a Detector Loop.

1.2 Materials

1.2.1 Loop Wire

Loop wire shall be splice-free lengths of: No. 14 AWG, 19 Strands, single-conductor bare copper wire. The conductor insulation (BLACK or GRAY) shall be high density polyethylene and shall be both ultraviolet and weather resistant. The wall thickness shall be 0.030 inch minimum point thickness. Cable shall be manufacturer in accordance with the requirements of Underwriters Laboratories, Federal specifications, and the National Electric Code.

1.2.2 Sealant

The loop sealant used to fill the saw cuts and other gaps, shall be of a type intended for traffic loop embedding. The cured sealant shall be semi-flexible, and be capable of adhering securely to concrete, asphalt, wood, metal, etc. It shall be unaffected by freeze-thaw cycling, salts, gasoline, oil, sewerage and corrosive chemicals. It shall be proportioned and mixed per the manufacturer's specifications. Acceptable sealants are listed on the SCDOT QPL.

1.2.3 Waterproofing Splice Materials

The splice at the "junction point" shall be made waterproof using the materials listed below:

a) Cable Splice Kit - Commercially available, Low-Voltage, water-proof Splice-kit; to be Plymouth "PLYFLEX"; or 3M "SCOTCH-LOK", Unipak #3570, Resin 400, (or approved equal). To be installed per manufacturer's instructions.
b) Heat Shrink tubes
c) Gel Caps
d) Vinyl plastic electrical tape (use where required)-Cold and weather resistant, 19 mm (3/4 inch) wide, 1.8 mm (7 mil) thickness, (Scotch 33+ or approved equal). Shall use liquid electrical coating (where required) - Fast-drying sealant compatible with vinyl tape, brush-applied (3M, Scotchkote or approved equal).

1.2.4 Underwater Splicing Kit

Where shown on the Plans, in very wet areas an Underwater Splice Kit may be required at the "junction point". This splicing kit shall consist of a two-piece mold-body, with pourable resin sealing compound, funnels, and end sealing strips (3M, Scotchcast 82-A1 or approved equal).

1.2.5 Wire Crimps

The PREFERRED splicing method at the "junction point", shall use a commercial/industrial grade, copper-alloy CRIMP-ON, with one end closed, of a size proper for the gauge of wires to be spliced, and
the number of conductors. It shall be installed with butt splice using a T & B type crimping tool or similar tool, intended for the purpose (NOT regular pliers). (Note: wire-nuts are not acceptable.)

1.2.6 Solder

The alternate method of splicing at the "junction point" is to use SOLDER, which shall be electronic-grade, rosin-core, 60 lead/40 tin. Acid-core solder is not acceptable, nor are acid-type soldering pastes.

1.2.7 Certification

The Vendor shall provide details for the loop sealant, loop wire, and lead-in wire proposed.

CATALOG CUTS ARE REQUIRED

SAMPLE REQUIRED

1.2.8 Warranty

The Vendor shall furnish SCDOT with any warranties on equipment and materials that are provided by the Manufacturer or Vendor as normal trade practice.

1.3 Measurement

Wire for Detector Loops, of the size and numbers of conductors specified, shall be measured by LINEAR FEET and furnished in 5000’ reels.

1.4 Payment

Furnishing Wire for Detector Loops, measured as provided above, will be paid at the contract unit price bid for:

| FURNISH NO. 14 COPPER WIRE, 1-CONDUCTOR FOR LOOP WIRE | 5000’ REEL |
M680.2 SPLICE BOX / JUNCTION BOX

1.1 Description

This specification describes requirements for furnishing a Splice Box and/or Junction Box. The Splice Box shall consist of a Box and Cover, installed over aggregate. The Splice Box is intended for use as a signal cable electrical enclosure. The Junction Box is intended for use as a loop detector “junction point”.

1.2 Materials

1.2.1 Box and Cover

The Splice Box shall consist of a Base having an open top (the Box), with a separate removable Cover. They shall be made from a lightweight, blended modern material, using fiberglass reinforcement, and shall be NON-CONCRETE / NON-STEEL. They shall be GRAY IN COLOR. Covers shall have the LEGEND “TRAFFIC SIGNAL”. They shall use HEX-HEAD stainless steel bolts. The PHYSICAL FEATURES AND THE NOMINAL SIZE AND DIMENSIONS for the Box and Cover, are shown on the Standards or the Design Details, and are listed below.

<table>
<thead>
<tr>
<th></th>
<th>WIDTH</th>
<th>LENGTH</th>
<th>DEPTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPLICE BOX:</td>
<td>13 inch</td>
<td>24 inch</td>
<td>18 inch</td>
</tr>
<tr>
<td>HAND BOX:</td>
<td>17 inch</td>
<td>30 inch</td>
<td>24 inch</td>
</tr>
<tr>
<td>MINI SPLICE BOX:</td>
<td>12 inch</td>
<td>12 inch</td>
<td>12 inch</td>
</tr>
</tbody>
</table>

1.2.2 Design Load

Boxes shall be designed to meet or exceed the loading requirements for a Tier 15 application per the Society of Cable Engineers (SCTE) ANSI/SCTE 77-2007 “Specification for Underground Enclosure Integrity, Table – Test Loads”.

Thus, boxes shall be designed and tested for the following test loads: Cover- vertical load 22,500 pounds distributed over a 10 inch x 10 inch area. Box - vertical load 22,500 pounds distributed over a 5 inch x 10 inch. Box- lateral load of 1200 pounds per square foot. The cover deflection shall be less than 0.5 inch; and the box deflection less than 0.25 in/ft of length.

1.2.3 Western Underground Committee (WUC)

Using the above specified loads, the Splice Box shall meet or exceed the WUC “Recommended Guide No. 3.6, Non-Concrete Enclosures”. Structural Requirements shall include: testing for Vertical Load on Cover; Vertical Load on Box; Lateral Load on Box. Further they shall meet WUC recommendations for: Accelerated Service per ASTM D-756; Chemical Resistance per ASTM D-543; Simulated Sunlight Resistance per ASTM G-53; plus Water Absorption; and Flammability. Covers shall be skid-resistant, with a minimum coefficient of friction of 0.50.

1.2.4 Certification

CATALOG CUTS ARE REQUIRED
1.2.5 Warranty

The Vendor shall furnish SCDOT with any warranties on equipment and materials that are provided by the Manufacturer or Vendor as normal trade practice.

1.3 Measurement

Furnishing a Splice Box will be measured by EACH Box including Box and Cover.
Furnishing a Junction Box will be measured incidental to the conduit to which it is used with.

1.4 Payment

Furnishing Splice Box and/or Junction Box, accepted and measured as provided above, will be paid for at the contract unit price bid for:

<table>
<thead>
<tr>
<th>Description</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>FURNISH 13&quot;X24&quot;X18&quot;D.ELEC.FLUSH UNDGRD.ENCLOSURE-(STR.POLY.CONC.)HD</td>
<td>EA</td>
</tr>
<tr>
<td>FURNISH 17&quot;X30&quot;X24&quot;D.ELEC.FLUSH UNDGRD.ENCLOSURE-(STR.POLY.CONC.)HD</td>
<td>EA</td>
</tr>
<tr>
<td>FURNISH 12&quot;X12&quot;X12&quot;D.ELEC.FLUSH UNDGRD.ENCLOSURE-(STR.POLY.CONC.)HD</td>
<td>EA</td>
</tr>
</tbody>
</table>
M682.3 STEEL CABLE

1.1 Description

This specification describes requirements for furnishing splice-free lengths of Steel Cable with cable supports, for mounting signal heads, signs, interconnect runs, and installing back guys.

1.2 Materials

1.2.1 Fabrication

Steel Cable shall be fabricated of 7 steel wires, Class A double galvanized in accordance with ASTM A-475, and twisted into a single concentric strand to conform with the following schedule:

<table>
<thead>
<tr>
<th>Diameter (inches)</th>
<th>Strand Size (AWG)</th>
<th>Tensile Strength (pounds)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/4</td>
<td>14</td>
<td>3,150</td>
</tr>
<tr>
<td>3/8</td>
<td>11</td>
<td>6,950</td>
</tr>
<tr>
<td>7/16</td>
<td>9.5</td>
<td>9,350</td>
</tr>
<tr>
<td>1/2</td>
<td>8</td>
<td>12,000</td>
</tr>
</tbody>
</table>

Usage

Span Wire - All Steel Cable used as span wire shall be 3/8 inch in diameter, unless otherwise noted on the Plans.

Messenger Wire - All Steel Cable used as messenger shall be 1/4 inch in diameter, unless otherwise noted on the Plans.

Tether Wire - All Steel Cable used as tether wire shall be 1/4 inch in diameter, unless otherwise noted on the Plans.

Back Guy - All Steel Cable used for back guying shall be 3/8 inch in diameter, unless noted otherwise on the Plans.

Cable Supports

Aluminum Tie-wrap - Shall be Flat Aluminum Armor Tape, 0.05 inch Thick X 0.30 inch Wide, typically furnished in 10 pound coils.

Where specifically required, Support Rings (also called "cable rings", "messenger rings") shall be galvanized in accordance with ASTM A-153, and the design approved by the ENGINEER, and shall be 2 to 3 inches in diameter (to contain the Electrical Cables), and sized to specifically match the Steel Cable.

Miscellaneous Hardware

All hardware and fittings shall be of the type shown on the Standards or the Construction and Installations Details.

All hardware and fittings shall be made of galvanized steel or non-corrosive metal. The tensile strength of all hardware shall be equal-to or greater-than the Steel Cable installed.
All thimble-eye and oval eye-bolts used to connect the automatic compression dead-end clamps to wooden poles, shall be 3/4 inch diameter. S-hooks shall be the same diameter as the cable. Fiberglass insulators shall be fabricated from epoxy-resin impregnated fiberglass strands, and have a tensile strength 50% greater than the Steel Cable.

**Certification**

The Vendor shall provide a Certification from the Manufacturer that the Steel Cable has been tested to meet or exceed the required tensile strength.

**Warranty**

The Vendor shall furnish SCDOT with any warranties on equipment and materials that are provided by the Manufacturer or Vendor as normal trade practice.

**1.3 Measurement**

Steel Cable of the SIZE specified shall be measured by the LINEAR FEET and furnished in 1000' reels.

**1.4 Payment**

Accepted quantities of Steel Cable, measured as stated above will be paid for at the contract unit price bid for:

<table>
<thead>
<tr>
<th>Description</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>FURNISH 3/8&quot; GALVANIZED STEEL CABLE</td>
<td>1000’ REEL</td>
</tr>
<tr>
<td>FURNISH 1/4&quot; GALVANIZED STEEL CABLE</td>
<td>1000’ REEL</td>
</tr>
</tbody>
</table>
M682.4 PEDESTRIAN POLE AND BASE

1.1 Description

This specification describes requirements for furnishing a Pedestrian Pedestal Pole and Base.

1.2 Materials

1.2.1 Aluminum Base

Pedestrian bases shall be constructed of aluminum. The neck of the base shall be threaded to accommodate a 4 inch diameter aluminum pole. The neck will also house a set screw that prevents counter rotation.

1.2.2 Anchor Bolts

Four (4) Anchor Bolts shall be supplied with each base. Each Anchor Bolt shall be threaded at the top, and shall have an L-bend at the bottom. A total of eight nuts and eight flat washers shall be supplied. Nuts shall be ASTM 563 Grade A.

1.2.3 Aluminum Pole

Aluminum pedestrian pole shall be 4 inches in diameter and 4 feet, 8 feet and/or 10 feet in length. It shall be constructed of polished aluminum and threaded on one end.

1.2.4 Concrete

The Concrete provided shall be CLASS 3000, and shall be mixed, poured, and finished in accordance with SC DOT STANDARD SPECIFICATIONS, Section 701, 702, 703, and 704.

1.2.5 Powdercoating

Color to be specified in special provisions or on signal plan. Powdercoating over aluminum shall be done at the factory or during the manufacturing process.

1.2.6 Warranty

The Vendor shall furnish SCDOT with any warranties on equipment and materials that are provided by the Manufacturer or Vendor as normal trade practice.

1.3 Measurement

Furnishing a Pedestrian Pedestal Pole and Base will be measured by EACH including all required incidental hardware.

1.4 Payment
Furnishing a Pedestrian Pole and Base measured as provided above, will be paid for at the contract unit price for:

<table>
<thead>
<tr>
<th>Description</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>FURNISH 4' BREAK-AWAY ALUMINUM PEDESTAL POLE AND BASE</td>
<td>EA</td>
</tr>
<tr>
<td>FURNISH 8' BREAK-AWAY ALUMINUM PEDESTAL POLE AND BASE</td>
<td>EA</td>
</tr>
<tr>
<td>FURNISH 10' BREAK-AWAY ALUMINUM PEDESTAL POLE AND BASE</td>
<td>EA</td>
</tr>
</tbody>
</table>
**M686.1 VEHICLE SIGNAL HEADS AND BACKPLATES**

### 1.1 Materials

#### 1.1.1 Signal Heads

All Signal Heads shall conform to the ITE July 2005 “VTCSH”. Specifications of the ITE (Light Emitting Diode (LED) Vehicular Traffic Signal Modules (hereafter referred to as ITE July 2005 “VTCSH”.) published by the INSTITUTE OF TRANSPORTATION ENGINEERS (ITE), “Standard for Adjustable Face Vehicular Traffic Control Signal Heads” (latest Revision). All sections of each head shall be furnished by the SAME MANUFACTURER. The only exception is where the top section must be aluminum. Polycarbonate Vehicle Signal Heads of the size, type, and arrangement specified, are to be furnished by the Manufacturer or Vendor, together with ALL the necessary hardware for make-up and mounting. The basic material requirements are listed below:

1.1.1.1 Housing

The COLOR shall be Federal YELLOW (13538).

Each Signal Head housing shall consist of an assembly of separate interchangeable sections, each holding an individual optical unit, and stainless steel parts between the signal heads. THE TOP SECTION OF EACH 3-SECTION HEAD SHALL HAVE AN ALUMINUM REINFORCING / BEARING PLATE INSIDE AS WELL AS ON THE OUTSIDE OF THE HEAD. The Aluminum reinforcing / bearing plate SHALL HAVE TWO STAINLESS ¼” retaining BOLTS WITH LOCK WASHER AND NUT AND shall provide for a watertight seal to prevent water from entering the housing. THE BOLTS SHALL PROTRUDE COMPLETELY THRU BOTH PLATES AND THE TOP OF THE HEAD. The TOP SECTION OF THE FIVE-SECTION CLUSTER, AND OF THE FOUR-SECTION IN-LINE, SHALL BE POWDER COATED ALUMINUM. The Aluminum section shall be Federal Yellow (13538) and shall be fade resistant for a minimum of five years. The rest of those configurations shall be POLYCARBONATE and it shall also be fade resistant for five years. Heads with noticeable premature Fading shall be subject for replacement covered under the warranty.

The material of the Housing, Door, and Visor shall be engineering-grade structural, ultraviolet-stabilized PURE POLYCARBONATE resin. Other plastics are NOT acceptable. All edges shall be milled to a uniform round edge and free of all sharp edges.

1.1.1.2 Polycarbonate

The Department is aware of the design characteristics of this material--particularly the fact that as fillers are added for strength, the material becomes more brittle. We also recognize that signal manufacturers have optimized their designs around a specific formulation. Therefore the VENDOR shall provide complete particulars about the polycarbonate type number proposed for the Signal head. Further the VENDOR shall submit strength and wind tunnel test results (See Paragraph 1.2.5 Certification)

1.1.1.3 Door

The COLOR shall be Federal YELLOW (13538).

The door latches shall consist of stainless steel latch eye-bolts, wing-nut, and washer; all retained to keep them from falling to the street.
The hinges shall be reinforced protrusions (mortise and tenon) from the door. The hinges shall be attached to the head with Stainless steel roll pins or reinforced polycarbonate pins that are made as part of the head.

1.1.1.4 Visor

The Visor COLOR shall be Federal YELLOW (13538) outside, and dull BLACK (37038) inside.

The Visor CLASSIFICATION shall be TUNNEL (slot at bottom), unless otherwise specified.

The Visor shall be twist-on, attached to the housing with four stainless steel SCREWS, through the twist-on tabs on the visor.

1.1.1.5 Wiring

Wiring and Electrical shall be in accordance with ITE Standards. Color Coded wiring shall be factory connected to a barrier type TERMINAL BLOCK in the LOWER PORTION OF THE RED SECTION of each Signal Head. In the five-section cluster, the TERMINAL BLOCK shall be located in the (TOP) SECTION.

The TERMINAL BLOCK shall be double sided barrier type with two screws per barrier section; and shall make connections to the lamp wires using fast-on SPRING-LOADED SPADE LUGS and screws, (i.e. provisions should be made so that spade lugs or screws can be used on the same terminal block.) ONE PER SCREW. More than one neutral is allowed per terminal. The neutral designated terminal shall have triple stack connections supplied. The number of barrier sections in the TERMINAL BLOCK for the three and four section head, shall be 6-position, 12-terminal. For the five section head, it shall be 8-position, 16-terminal. The screws in the terminal block shall be no less than 8mm in length.

1.1.1.6 Mounting Assemblies

All mounting hardware shall be furnished.

Span Wire Mounting

Hardware for Span-Wire shall be finished Powder Coated Federal YELLOW (13538)

For Span-Wire mounting, the HANGER shall be cast ALUMINUM, and shall contain two stainless steel J-Hooks with stainless steel pin, properly sized BOWTIE cotter pin, lock washers and nuts, and have seven notches to position the hanging signal. A double weatherhead entrance shall be used. The weatherhead entrance BUSHING shall have a 1 1/2 inch hole for wire entry. THE NIPPLE USED SHALL BE OF THE SAME BRAND AS THE GOOSENECK AND SHALL HAVE AT LEAST TWO INCHES OF THREAD. THE THREAD PATTERN SHALL BE VIBRATION RESISTANT SEMI COURSE THREAD. THE NIPPLE SHALL BE TORQUED TO PROPER MANUFACTURER SPECIFICATIONS. THE SET SCREW SHALL BE INSTALLED WITH BLUE LOCTITE AND TIGHTNED SO THAT NIPPLE WILL NOT TURN. THE NIPPLE SHALL ALSO HOLD THE INTERNAL BEARING PLATE IN PLACE. The entrance diameter shall be maintained throughout the weatherhead, without restriction or reducing the hole diameter, into the signal head. No Tri-Stud hangers allowed. No special tools shall be required to tighten or adjust signal heads. Hangers with mismatched threads that will not tighten will be rejected. Span wire hangers shall not require disassembly to install on span wire.

For Span-Wire mounting, for MULTI-WAY heads, there shall be included a “SWIVEL BALANCE ADJUSTER” for proper vertical alignment.

For 5-SECTION CLUSTER signal assemblies, ONE Span-Wire Hanger shall be furnished, attached to the top signal section. The configuration shall be FHWA MUTCD TYPE ‘S’, known as the "dog-house head". At the bottom of the top signal section, a cast-aluminum bracket shall connect with the
arrow side, and with the ball indication side. This bracket shall have a removable, threaded "knockout" plug at each 90-degree turn, to facilitate wiring.

A 2 inch wide ribbed, cast aluminum BOTTOM BRACKET (No. 10 018 or equiv.), having holes 17 inches on-center, shall be used to unify the assembly. (The two sides of the cluster shall be not more than 8 inches apart.)

For 4-SECTION "T" ASSEMBLY, ONE Span-Wire Hanger shall be furnished, together with two cast aluminum brackets. The two red sections shall be not more than 8 inches apart. Tri-studs will not be accepted.

**Mast Arm Mounting**

Unless otherwise shown on the plans, rigid signal head mounting brackets shall be used. The bracket shall consist of a top- and bottom-arm, an extruded aluminum vertical tube, a vertical tube clamp, and a mast-arm clamp, with all hardware. The Bracket shall be COMPLETELY RUST PROOF, and shall be fully adjustable in all dimensions and angles.

1.1.1.7 **Balance Adjuster**

When needed, a Balance adjuster shall be aluminum with a ¾” WEH. It shall be furnished Powder Coated Federal Yellow (13538) and shall have stainless steel bushing, stainless steel hardware, and a stainless steel eye. This item, as part of the furnish contract, shall not come attached to the signal head assemblies.

1.1.2 **LED Modules**

Provide modules that consist of an assembly that utilizes LEDs as the light source in lieu of an incandescent lamp for use in traffic signal sections. Use LEDs that are AlInGaP technology for red and yellow indications and InGaN for green indications. Install the ultra-bright type LEDs that are rated for 100,000 hours of continuous operation from -40°C to +74°C. Design modules to have a minimum useful life of 60 months, and to meet all parameters of this specification during this period of useful life.

Ensure, unless otherwise stated in these specifications, that each module meets or exceeds the requirements of the Interim Purchase Specification of the ITE July 2005 “VTCSH”. (Light Emitting Diode (LED) Vehicular Traffic Signal Modules (hereafter referred to as ITE July 2005 “VTCSH”. Arrow displays shall meet or exceed the electrical and environmental operating requirements of ITE July 2007 “VTCSH” of the ITE specifications.

Each LED module supplied shall be as a set from the same manufacturer.

Lamp socket ‘Screw-in’ type products shall not be allowed for vehicle traffic signals.

Inline fuses shall not be used in the wire from the head to the terminal end. This wire shall not have any splice points

1.1.2.1 **Electrical**

Provide modules that have maximum power consumption equal to or below the requirements of Table 1. Design the modules to operate from a 60 ± 3 HZ AC line voltage ranging from 80 volts to 135 volts. Ensure that fluctuations of line voltage have no visible effect on the luminous intensity of the indications. Design the module to have a normal operating voltage of 120 VAC, and measure all parameters at this voltage.

Certify that the module has a power factor of 0.90 or greater, and that THD (current and voltage) induced into an AC power line by the module does not exceed 20 percent for modules with power ratings
above 15W, and 40 percent for modules with power ratings of 15W or less. Design the modules onboard circuitry to include voltage surge protection to withstand high repetition noise transients as stated in Section 2.1.6 of NEMA Standard TS-2, 1992. Ensure all wiring meets the requirements of Section 13.02 of the ITE Publication: Equipment and Material Standards, ITE July 2005 “VTCSH”. Provide spade terminals appropriate to the lead wires and sized for a #10 screw connection to the existing terminal block in a standard signal head.

Ensure that the module is compatible with signal load switches and conflict monitors. Design the module to provide sufficient current draw to ensure proper load switch operation while the voltage is varied from a regulated 80Vrms to 135 Vrms. Design off-state for green and yellow modules to be 30Vrms or greater, and on-state to be 40Vrms or greater. Also for green and yellow modules, design the voltage decay to 10 Vrms or less to be 100 milliseconds or less. Ensure that the control circuitry prevents current flow through the LEDs in the off state to avoid a false indication.

Design all modules to meet existing SCDOT monitor specifications for the following type of signal monitors: 170 controller/cabinet Type 210, 2010, 2010ECL and 2010ECLIP conflict monitors (including red monitoring and so-called plus features such as dual indication detection and short yellow time detection).

Ensure that the modules and associated onboard circuitry meet Class A emission limits referred to in Federal Communications Commission (FCC) Title 47, Subpart B, Section 15 regulations concerning the emission of electronic noise.

1.1.2.2 Photometric and Chromaticity Requirements

The maintained minimum luminous intensity values for the modules are shown in ITE July 2005 “VTCSH” specifications. Test all ball modules for luminous intensity at 25°C to meet 115% of values in table 2. Design and certify the modules to meet or exceed the maintained minimum luminous intensity values throughout the warranty period based on normal use in a traffic signal operation over the operating temperature range. Test the Red and Green modules for maintained luminous intensity at 74°C using ITE July 2005 “VTCSH” specifications. Use LEDs that conform to the chromaticity requirements of ITE July 2005 “VTCSH” specifications throughout the warranty period over the operating temperature range. Make chromaticity coordinate compliance measurements at 25°C.

1.1.2.3 Physical and Mechanical Requirements

Design the modules as retrofit replacements for installation into standard incandescent traffic sections that do not contain the incandescent lens, reflector assembly, lamp socket and lens gasket. Ensure that installation does not require special tools or physical modification for the existing fixture other than the removal of the incandescent lens, reflector assembly, lamp socket, and lens gasket.

1.1.2.4 Environmental Requirements

Provide modules that are rated for use in the operating temperature range of -40°C (-40°F) to +74°C (+165°F). Ensure that the modules (except yellow) meet all specifications throughout this range. Fabricate the module to protect the onboard circuitry against dust and moisture intrusion per the requirements of NEMA Standard 250-1991 for Type 4 enclosures to protect all internal components.

1.1.2.5 Module Construction

Design the module to be a single, self-contained device with the circuit board and power supply for the module inside and integral to the unit.

Design the assembly and manufacturing process for the module to ensure all internal components are adequately supported to withstand mechanical shock and vibration from high winds and
other sources. Wire the individual LEDs such that a catastrophic loss or the failure of one LED will result in the loss of not more than 20 percent of the signal module light output. LEDs shall be soldered to the circuit board.

1.1.2.6 Materials

Fabricate the lens and signal module from material that conforms to ASTM specifications. Enclosures containing either the power supply or electronic components of the module shall be made of UL94VO flame retardant materials. The lens of the signal module is excluded from this requirement.

1.1.2.7 Module Identification

Permanently mark each module with the manufacturer’s name, model number, serial number, date of manufacture, and lot number if applicable. Identifiers shall be clearly understood. A Barcode shall also be incorporated into the label with all identifiers.

Permanently mark the following operating characteristics on the back of the module: rated voltage and rated power in Watts and Volt-Ampere.

If a specific mounting orientation is required, provide permanent markings consisting of an up arrow, or the word “UP” or “TOP” for correct indexing and orientation within the signal housing.

1.1.2.8 Lens

Provide a lens that is integral to the unit with a smooth outer surface and UV stabilized to withstand ultraviolet exposure for a minimum period of 60 months without exhibiting evidence of deterioration. Coat the front of a polycarbonate lens to make it more abrasion resistant. Seal the lens to the module to prevent moisture and dust from entering the module.

Tint the red and yellow lens to match the wavelength (chromaticity) of the LED. Provide a green lens that is either colorless or tinted to match the wavelength (chromaticity) of the LED.

1.1.2.9 12 Inch Arrow

The following specification requirements apply to the 12 inch (300 mm) arrow module only, which is the only size arrow allowed. All general specifications apply unless specifically superseded in this paragraph. Ensure that the arrow module meets specifications stated in ITE 2007 (VTCSH) for arrow indications. Design arrow displays to be LEDs to meet ITE 2007 (VTCSH) specifications. Determine the luminous intensity using the CALTRANS 606 method or similar procedure. http://itvendors.dot.ca.gov/hq/esc/ctms/ctmsindex600.html

1.1.2.10 Testing

Provide test results for ball modules from an independent testing laboratory showing wattage and compliance with ITE 2007 (VTCSH) arrow specifications. Ensure that the LED signal modules tested are typical, average production units.

Burn In

Energize the sample module(s) (a sample of one module minimum) for a minimum of 24 hours, at 100 percent on-time duty cycle, at a temperature of +74°C (+165°F) before performing any qualification testing. Any failure of the module, which renders the unit non-compliant with the specification after burn-in, shall be cause for rejection. All specifications will be measured including, but not limited to:
Photometric (Rated Initial Luminous Intensity)

Measure at +25°C. Measure luminous intensity for red and green modules upon the completion of a 30 minute 100 percent on-time duty cycle at the rated voltage. Measure luminous intensity for yellow modules immediately upon energizing at the rated voltage.

Chromaticity (Color)

Measure at +25°C. Measure chromaticity for red and green modules upon the completion of a 30 minute 100 percent on-time duty cycle at the rated voltage. Measure chromaticity for yellow modules immediately upon energizing at the rated voltage.

Electrical

Measure all specified parameters for quality comparison of production quality assurance on production modules. (rated power, etc.)

Equipment Compatibility

In addition to the test of modules for compatibility with controllers, conflict monitors, and load switches, perform the following test, and certify the results. Connect each signal module to the output of a standard load switch connected to a variable AC voltage supply (95 to 135 VAC). With the load switch “off,” vary the AC voltage from 95 Vrms to 135 Vrms, and measure the drop across the module. Readings greater than 15 Vrms are unacceptable.

1.1.2.11 Photometric Maintenance

Provide testing at an independent laboratory for a designated module to be tested for maintained luminous intensity at 25°C once each year during the five-year warranty period.

Notes:
Design signal modules to meet ITE requirements as a minimum throughout the warranty period. Design signal modules to have a minimum initial intensity equal to 115% of Table 2 at 25°C. Independent laboratory test reports are required to validate the initial intensity

1.1.3 Signal Backplate

A Signal Backplate constructed of thin strip of polycarbonate material that extends outward from and parallel to a signal face on all sides of a signal housing to provide a background for improved visibility of the signal locations shall be installed on all Signal Heads. Signal backplates shall be appropriate for the size and manufacturer of each signal head and be of monolithic construction. The backplate shall have a 2” retro reflective yellow border (Type XI (eleven) prismatic sheeting) applied, unless noted otherwise. See Standard Drawing for application.

1.1.4 Certification

CATALOG CUTS ARE REQUIRED

The Vendor shall provide written Certification from the Manufacturer that the latest ITE STANDARDS have been met.

The Vendor shall provide design details and drawings in sufficient detail for complete evaluation and comparison with these Specifications. Any exceptions to these Specifications must be stated in writing at that time.
The Vendor shall provide written specifications (product sheets) for the specific POLYCARBONATE (LEXAN TYPE NO.) formulation that is proposed. Bids shall provide the tests results for the IZOD IMPACT tests.

Housing Type No. or See Attached Letter

The Vendor shall provide written TEST RESULTS DEMONSTRATING THE STRENGTH OF THE 3-SECTION SIGNAL HEAD. The test signal shall not have the SCDOT aluminum bearing plate installed. The tests should include static stress and wind tunnel setups.

Sample modules shall be provided for Department approval upon request. The sample modules submitted shall be representative of typical average production units. Samples will not be returned unless requested by the vendor.

The manufacturer of LED Modules shall have previously supplied indications to other states or cities and shall supply a list of these cities and/or states with the bid. The reference shall include name of city or state, contact person and model number of the LED display(s) previously supplied.

Sample modules shall be provided for Department approval upon request. The sample modules submitted shall be representative of typical average production units. Samples will not be returned unless requested by the vendor.

1.1.5 Warranty

The Vendor shall furnish SCDOT a 60 month warranty from purchase date on equipment, materials, modules and lamps that are provided by the Manufacturer or Vendor as normal trade practice.

Replacement shall be provided within 30 days of receipt of failed equipment at no cost to the Department (including shipping costs). Faulty equipment shall be picked up from the seven signal shops by the vendor.
M686.3 PEDESTRIAN SIGNAL HEADS

1.1 Materials

1.1.1 Pedestrian Head Housing

All signal heads shall conform to the specifications of the INSTITUTE OF TRANSPORTATION ENGINEERS (ITE), "Pedestrian Traffic Control Signal Indications" (latest Revision) August 4, 2010. All pedestrian signal heads shall be furnished by the same manufacturer and shall be new and current production models. Pedestrian signal heads of the size, type, and arrangement specified, are to be furnished, together with ALL the necessary hardware for make-up and mounting. For the purpose of this Specification, the basic material requirements are listed below:

1.1.1.1 General

All pedestrian signal heads shall use a SOLID display LED HAND/MAN module as a light source; a nominal message bearing surface of 16 inches; and SYMBOLIC MESSAGES; the Portland Orange UPRIGHT HAND for "Don't Walk", and Lunar White WALKING MAN for "Walk" OR a countdown display with a nominal message bearing surface of 16 inches with a SOLID SYMBOLIC MESSAGE Hand-Man overlay on the left and the countdown on the right. The Module and the Housing shall be two separate pieces.

1.1.1.2 Housing, Visor

The housing shall be a one piece ultra-stabilized, permanently colored, flame-retardant, PURE Polycarbonate resin. The materials and construction used shall comply with ITE specifications (latest Revision) August 4, 2010. A single housing shall contain the LED module. A weather tight neoprene gasket shall be provided. All Housing hardware shall be stainless steel or aluminum. The terminal strip shall be a minimum 4 position, double row, tinned over brass with zinc plated #10 steel screws. The DOOR shall swing down with two hidden hinges at the bottom, with removable locking pins. The DOOR shall be a corrosion resistant, powder coated, one-piece aluminum alloy die-casting, and pins. A visor shall also be furnished and shall be securely fastened with stainless steel screws to the front of the signal housing, to shield the lens from the sun.

1.1.1.3 Finish

The finish colors shall be FEDERAL YELLOW (13538) for the door, housing, and exterior surfaces of the visor; and FLAT BLACK (37038) for the inside of the visor and for the part of the door within the visor.

1.1.1.4 Mounting

Pedestrian Heads must fit with brackets and related hardware described below for properly installing the pedestrian signal heads.

For **single post-top mount**:
A 1½” aluminum post top signal mounting shall be furnished. It shall consist of a slip fitter assembly for a one-way signal. It should be Pelco Product Part Number SE-3037 or equivalent with a FEDERAL YELLOW finish. See Diagram 1.

For **dual post-top mount**:
A 1½” aluminum post top signal mounting shall be furnished. It shall consist of a slip fitter for 1- and 2-way signal heads with a 4 inch slip-fitter bracket with a set screw, a lower mounting assembly, a support tube, and an upper mounting assembly. This mounting assembly should be Pelco Product Part Number SE-3257 or equivalent with a FEDERAL YELLOW (13538) finish. See Diagram 2.

For side-of-pole mount:
A CLAMSHELL mount shall be furnished, compatible with a 4-1/2 inch and larger pole. The clamshell mount shall be compatible with either bolt mounting (to a wood pole), or band-on mounting to a steel pole. The side-mount shall make provisions for a hinge, and for wiring and terminal block. All hardware shall be tamper resistant. See Diagram 3.

A 1½” aluminum side-of-pole signal mounting shall be furnished. It shall consist of hub plates with conduit openings, and upper and lower arm assemblies for a 1-way signal. This mounting assembly should be Pelco Product Part Number SP-5523 or equivalent with a FEDERAL YELLOW (13538) finish. See the Diagram 4.

Locking devices equivalent to serrated washers shall be furnished with each type of mounting brackets, so that the pedestrian signal heads may be firmly and positively held in their required alignment.

1.1.2 Hand/Man LED Module and Hand/Man COUNTDOWN LED Module

Each LED module supplied shall be factory installed in the pedestrian signal head or shipped as a complete module with weather tight neoprene gasket to retrofit existing SCDOT polycarbonate pedestrian signal heads if applicable. Design the LED pedestrian signal module for installation into existing standard pedestrian signal head. All signal heads shall conform to the specifications of the INSTITUTE OF TRANSPORTATION ENGINEERS (ITE), “Pedestrian Traffic Control Signal Indications” (latest Revision) August 4, 2010

Identify each module with the manufacturer's name, model number, serial number, date of manufacture, and lot number if applicable per “The Equipment and Materials Standards” of the Institute of Transportation Engineers “Vehicular Traffic Control Signal Heads”. The Identifiers shall be clearly understood with no need to decipher. A Barcode shall also be incorporated into the label with all identifiers.

The lens shall be a clear, non-glare, non-frosted polymeric lens with a matte finish. It shall be UV stabilized to withstand ultraviolet exposure for a minimum period of 60 months without exhibiting evidence...
of deterioration. Coat the front surface of a polycarbonate lens to make it more abrasion resistant. Ensure that the lens has light transmission properties equal to or greater than 80%.

1.1.2.1 Optical

Comply with “The Equipment and Materials Standards” of the Institute of Transportation Engineers “Vehicular Traffic Control Signal Heads.

LED Hand/Man Module

Provide **16 inch displays** that have SOLID Symbolic Messages that meet the dimension requirements cited in Chapter 3, Table 1 Symbol Message for Class 3 displays (minimum 11 inches high and 7 inches in width each). Configure the pedestrian signal module with a sufficient number of LEDs to provide an average luminous intensity which meets the specifications of the ITE specifications (latest Revision) August 4, 2010. Ensure they meet this average luminous intensity throughout the warranty period over the operating temperature range. Wire the LEDs such that a catastrophic loss or failure of one or more LEDs will result in the loss of not more than five percent of the pedestrian signal module light output.

LED Hand/Man Countdown Module

Provide **16 inch displays** that have SOLID Symbolic Messages that meet the dimension requirements cited in Chapter 3, Table 1 Symbol Message for Class 3 displays. Ensure that the countdown number display is a minimum of 7 inches high by 6 inches wide. Configure the pedestrian signal module with a sufficient number of LEDs to provide an average luminous intensity which meets the specifications of the ITE specifications (latest Revision) August 4, 2010. Ensure they meet this average luminous intensity throughout the warranty period over the operating temperature range. Wire the LEDs such that a catastrophic loss or failure of one or more LEDs will result in the loss of not more than five percent of the pedestrian signal module light output.

Design the countdown display as a double row of LEDs, and ensure the countdown display blanks-out during the initial cycle while it records the countdown time. Ensure that the countdown display is operational only during the flashing don’t walk, clearance interval. Blank out the countdown indication after it reaches zero until the beginning of the next flashing don’t walk indication, and design the controlling circuitry to prevent the timer from being triggered during the solid hand indication.

Provide **certification with the bids** for evaluation that the pedestrian signal module complies with the ITE specifications (latest Revision) August 4, 2010. Provide **with the bids**, written independent testing laboratory results showing that the pedestrian signal modules meet or exceed the luminous intensity requirements of ITE specifications (latest Revision) August 4, 2010.

Portland Orange LEDs for the hand and countdown shall be of the latest AlnGaP technology or higher and Lunar White LEDs for the man shall be of the latest InGaN technology or higher. All modules shall be ETL certified and on the ETL certification program.

1.1.2.2 Electrical

Ensure that LED modules are compatible with signal load switches and conflict monitors meeting NEMA Standard TS 1 - 1989. Design the module to provide sufficient current draw to ensure proper load switch operation while the voltage is varied from a regulated 80Vrms to 135Vrms. Provide control circuitry to prevent current flow through the LEDs in the off state to avoid a false indication. Design all modules to meet existing SCDOT monitor specifications for the following types of signal monitors: 170 cabinet/controller compatible SCDOT specified Type 210, Type 2010, Type 2010ECL, and Type 2010ECL-ip conflict monitors (including red monitoring and so-called plus features such as dual indication detection and short yellow time detection).
Provide lead wires that are eighteen gauge (18AWG) minimum copper conductors with 105 degree Celsius insulation and also be anti-capillary. There shall be no more than three lead wires exiting the unit with no external splices. Lead wires shall be a minimum of 36 inches long with NEMA “Locking spade” terminals that are appropriate to the lead wires and sized for a #10 screw connection to the existing terminal block in the pedestrian signal head.

The LED’s shall be soldered to the circuit board.

Ensure that the power consumption for the pedestrian signal modules is equal to or less than the following in watts, and that the modules have EPA Energy Star compliance ratings, it applicable to the shape, size and color.

<table>
<thead>
<tr>
<th>TEMPERATURE</th>
<th>25ºC</th>
<th>74ºC</th>
</tr>
</thead>
<tbody>
<tr>
<td>HAND</td>
<td>10</td>
<td>12</td>
</tr>
<tr>
<td>MAN</td>
<td>9</td>
<td>12</td>
</tr>
<tr>
<td>COUNTDOWN</td>
<td>9</td>
<td>12</td>
</tr>
</tbody>
</table>

1.1.3 Packaging

Each single pedestrian signal head, complete with visor and LED specified, completely assembled and designated mounting assembly, shall be packaged in a separate corrugated cardboard box. It shall be clearly labeled on the END of the box, in English, as to the type of mounting assembly contained therein. Manufacturer shall provide a packing list with the serial number(s), date(s) of manufacture, and lot number(s) if applicable.

Each style of retrofit module complete with weather tight neoprene gasket shall be packaged in a separate corrugated cardboard box. It shall be clearly labeled on the END of the box, in English.

1.1.4 Certification

Provide with the bids, written Certification from the intended Manufacturer, that ITE specifications (latest Revision) August 4, 2010 have been met for heads and modules.

The manufacturer shall have previously supplied indications to other states or cities and shall supply a list of these cities and/or states with the bid as references. The references shall include name of city or state, contact person, phone number, and model number of the LED display(s) previously supplied. Failure to submit references upon request shall be grounds for rejection of the bid.

The Vendor SHALL FURNISH, the design details and drawings in sufficient detail for complete evaluation of the Proposal, and comparison with these Specifications. Any exceptions to these Specifications must be stated in writing at that time.

Sample modules shall be provided for Department approval upon request. The sample modules submitted shall be representative of typical average production units. Samples will not be returned unless requested by the vendor.

NOTE: CATALOG CUTS ARE REQUIRED AT BID OPENING.

1.1.5 Warranty

During the period of 60 months following the date of Delivery, the Manufacturer or Vendor shall replace, at no expense to the Department (including shipping costs), any part of Polycarbonate Pedestrian Signal Head that fails by reason of defective material or workmanship. The Manufacturer or Vendor shall be responsible for pickup and delivery to the seven district signal shops and shall be within 150 miles of Columbia, South Carolina.
Performance shall be warranted for a period of 60 months of the date of delivery and shall include repair or replacement of an LED pedestrian module that exhibits light output degradation which in the judgment of the department, cannot be easily seen at 150 feet in bright sunlight with the visor on the housing or that drops below the luminous intensity output requirements of sections 3.2 and 3.3 of this specification. Failure due to workmanship, materials, and manufacturing defects shall be warranted for repair or replacement of the first 60 months of the date of delivery. The vendor shall replace any failed modules within 30 calendar days of notification.
M686.4 PEDESTRIAN PUSH BUTTON STATION ASSEMBLY WITH SIGN

1.1 Description

These items consists of furnishing AMERICAN DISABILITIES ACT APPROVED ALUMINUM PEDESTRIAN PUSH BUTTON STATION ASSEMBLIES AND PUSH BUTTON SIGNS of the types, sizes, and mounting specified, in accordance with these Specifications. All PUSH BUTTON STATION ASSEMBLIES AND PUSH BUTTON SIGNS shall be supplied with the appropriate mounting hardware.

1.2 Materials

1.2.1 Aluminum Push Button Station Assemblies

Each aluminum push button station assembly shall conform to the specifications as set forth by the AMERICAN DISABILITIES ACT (ADA). Each aluminum push button station assembly shall be provided with an adjoining sign and must be able to accommodate to the size of the specified sign (either 9 x 12 inch or 9 x 15 inch).

1.2.2 Dual Mount Bracket

A single dual mounting bracket shall be provided to allow for two push button station assemblies to be mounted on one pole with the buttons positioned below the sign.

1.2.3 Push Buttons (with or without adjoining sign)

The long life switch shall be actuated by a 2 inch diameter chrome plated button and shall be included into a vandal resistant one-piece cast aluminum assembly and include a cable guide. Any exposed screws on the push button station assembly shall be stainless steel or other rust resistant material, and be tamper-proof. There shall be no sharp edges.

1.2.4 Finish

The finish color shall be FEDERAL YELLOW (13538) for the aluminum push button station assembly

The push button shall operate on a circuit not to exceed 24 Volts.

1.2.5 Push Button Signs

Each aluminum push button station assembly shall be provided with an adjoining sign.

The push button sign shall be aluminum with minimum thickness of 0.1 inch, with rounded corners, and have a black legend on white background. The message shall be in accordance with the MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS (latest edition).

The signs shall be 9 x 12 inch for:

R10–3 "PUSH BUTTON FOR GREEN LIGHT" when used without Pedestrian Signal Heads (see diagram below)
R10-3b "TO CROSS PUSH BUTTON (MAN WALK SYMBOL W/DEFINITIONS) ← → (arrow-left/right)" when used with hand/man Pedestrian Signal Heads. The sign shall be reversible, such that one side displays the message with a left arrow and the other side displays the message with a right arrow (see diagram below).

or should be 9 x 15 inch for:

R10-3e "TO CROSS PUSH BUTTON (COUNTDOWN)" when used with countdown Pedestrian Signal Heads. The sign shall be reversible, such that one side displays the message with a left arrow and the other side displays the message with a right arrow (see diagram below).

1.2.6 Certification

CATALOG CUTS ARE REQUIRED

Provide written Certification from the intended Manufacturer, that ADA SPECIFICATIONS have been met for push buttons.

Provide design details and drawings sufficiently detailed. This is necessary for a complete evaluation of the Proposal, and comparison with these Specifications. Any exceptions to these Specifications must be stated in writing at that time.

Samples of each of the aluminum Pedestrian Push Button Station Assemblies and Signs shall be for Department approval upon request. The samples submitted shall be representative of typical average production units. Samples will not be returned unless requested by the vendor.

1.2.7 Warranty

During the period of 12 months following the date of purchase, the Manufacturer or Vendor shall replace, at no expense to the Department (including shipping costs), any part of the Pedestrian Push Button Station Assembly, Sign or Bracket that fails by reason of defective material or workmanship.
1. Measurement

Furnishing a Pedestrian Push Button Station Assembly and Sign will be measured by EACH unit, including all dual mounting brackets and incidental hardware.

Furnishing a Sign will be measured by EACH unit.

1.4 Payment

Furnishing a Pedestrian Push Button Station Assembly and Sign, measured as provided above, will be paid for at the contract unit price bid for:

<table>
<thead>
<tr>
<th>Description</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Furnish Pedestrian Push Button Microswitch Type Station Assembly (9&quot;x12&quot;)</td>
<td>EA</td>
</tr>
<tr>
<td>And Sign (R-10-3E)</td>
<td></td>
</tr>
<tr>
<td>Furnish Pedestrian Push Button Microswitch Type Station Assembly (9&quot;x15&quot;)</td>
<td>EA</td>
</tr>
<tr>
<td>And Sign (R-10-3E)</td>
<td></td>
</tr>
<tr>
<td>Furnish Pedestrian Push Button Microswitch Type</td>
<td>EA</td>
</tr>
<tr>
<td>Furnish Pedestrian Push Button Solid State With Light and Tone Station</td>
<td>EA</td>
</tr>
<tr>
<td>Assembly (9&quot;x12&quot;) And Sign (R-10-3E)</td>
<td></td>
</tr>
<tr>
<td>Furnish Pedestrian Push Button Solid State With Light and Tone Station</td>
<td>EA</td>
</tr>
<tr>
<td>Assembly (9&quot;x15&quot;) And Sign (R-10-3E)</td>
<td></td>
</tr>
<tr>
<td>Furnish Pedestrian Push Button Solid State With Light and Tone</td>
<td>EA</td>
</tr>
<tr>
<td>Furnish Dual Mounting Bracket for (9 X 15 inch) Sign</td>
<td>EA</td>
</tr>
<tr>
<td>Furnish 20’ Spun Aluminum Pedestrian Pole 4 ½” Diameter</td>
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</tr>
</tbody>
</table>

For Signs:

<table>
<thead>
<tr>
<th>Description</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Furnish Sign R10-3 (Push Button for Green Light)</td>
<td>EA</td>
</tr>
<tr>
<td>Furnish Sign R10-3b “To Cross Push (Man/Walk Symbol With Definitions)”</td>
<td>EA</td>
</tr>
<tr>
<td>Reversible for Arrows in Both Directions</td>
<td></td>
</tr>
<tr>
<td>Furnish Sign R10-3e “To Cross Push Button (Countdown - Arrow)” Reversible</td>
<td>EA</td>
</tr>
<tr>
<td>For Arrows in Both Directions</td>
<td></td>
</tr>
</tbody>
</table>
M686.5 SYMBOLIC LED BLANKOUT SIGN

1.1 Description

This specification describes requirements for furnishing Symbolic LED (Light Emitting Diode) No Right/Left Turn Blankout Sign, of Clam-Shell configuration, with Sun Visor and designated mounting hardware. The Blankout Sign and the mounting hardware are stated as one item.

1.2 Materials

1.2.1 Blankout Sign

All Blankout Signs shall be built to Institute of Transportation Engineers “Vehicular Traffic Control Signal Heads” (VTCSH) standards. All Blankout Sign housings shall be furnished by the same manufacturer and shall be new and current production models. The Blankout Sign shall be capable of displaying three distinct messages including blank message. The furnished Blankout Sign shall include all electrical and electronic hardware, structural materials, housings, and all the necessary hardware for make-up and mounting. The Blankout Sign, and its associated equipment, shall be capable of operating on a 24 hour a day, 7 day per week basis and shall conform to the physical and functional requirements of this Specification.

1.2.1.1 Symbol

All blankout signs shall use an illumination of International Symbol consisting of a red circle and slash and either a white right arrow or white left arrow. Symbols shall conform to MUTCD sign standards. When the display is not energized, the sign shall be effectively blank. The Symbol shall be illuminated by an assembly of high output lunar white and red LEDs.

1.2.1.2 Housing

The housing shall be a constructed of Aluminum and shall be weatherproof. The outside dimensions shall not be less than 26 inches high by 26 inches wide and 4 inches deep. The housing shall not be less that 0.125 inch aluminum with all corners being welded their full length. All welds shall use the tungsten inert gas method. A fitting shall be installed on the bottom of the sign in the middle for tethering. The back shall be aluminum of not less than 0.063 inches thick. The door shall be extruded aluminum of not less than 0.125 inch thickness and shall be welded on two corners and screwed together on the other two corners to provide access for installation of a faceplate and polycarbonate lens. The aluminum door shall be attached to the housing utilizing stainless steel hinges. The door shall be held secure to a neoprene gasket by stainless steel, quarter turn link locks. All hardware shall be stainless steel and no tools shall be required for routine maintenance. A retaining rod shall be provided to secure the door in the open position.

1.2.1.3 Visor

A three sided aluminum visor of not less than 0.063 inch thickness and 7 inches deep shall also be furnished and shall be securely fastened with corrosion resistant screws to the aluminum door, to shield the lens from the sun.
1.2.1.5 Finish

The finish colors shall be FEDERAL YELLOW (13538) for the door, exterior and interior of the sign enclosure, and exterior surfaces of the visor. Apply the yellow by the dry powder method. Apply the yellow finish by electrostatic spray and heat cure. Ensure the thickness of the finish is a minimum of 2.5 mils thick. Do not apply paint to the latching hardware. Paint two coats of FLAT BLACK (37038) for the inside of the visor, and for the part of the door within the visor.

1.2.1.6 Mounting

All mounting hardware shall be furnished for Span-Wire mounting, as requested by the purchase order. Hardware for Span-Wire shall be finished FEDERAL YELLOW (13538).

For Span-Wire mounting, the HANGER shall be cast ALUMINUM, and shall contain two (2) stainless steel J-Hooks with stainless steel lock washers and nuts, and have seven (7) notches to position the hanging signal. A double weatherhead entrance shall be used. The weatherhead entrance BUSHING shall have a 1.5 inch hole for wire entry. That entrance diameter shall be maintained throughout the weatherhead, without restriction or reducing the hole diameter, into the sign. No special tools shall be required to tighten or adjust signs. Span wire hangers shall not require disassembly to install on span wire.

A fastener shall be installed in the bottom of the sign housing to provide for attachment to a tether cable of ¼ inch diameter.

1.2.2 Symbolic LED Module

Provide a symbolic display that is a PCB (Printed Circuit Board) matrix with a mat black solder mask with minimum thickness of 0.093 inches and a silk screened component identifier. Mount LEDs on front of the PCB matrix. Mount all other components on the back of the black matrix. Ensure that a person with 20/20 vision can read a fully intensified, legible message from 500 feet in front of the sign under any light conditions. Ensure the message is not legible when the sign is off, even if in direct sunlight.

Design and certify the LED Blankout Sign to operate over a temperature range of –40°C to 165°C with an operating voltage range of 105 to 130 volts and a power factor >95%. Ensure that all electronic components are standard industry items that are available from wholesale electronics distributors. Provide components that are “solid state” type. Do not use electro-mechanical components such as relays, transformers or solenoids.

Ensure compatibility and proper triggering and operation with load switches and conflict monitors in signal controllers currently used by the Department. Ensure the on-board circuitry meets FCC title 47, sub-part B, section 15 regulations on the emission of electronic noise. The presence of ambient radio signals, magnetic or electromagnetic interference, including those from power lines, roadway lights, transformers or motors, within 1 foot of any of the components of the Blankout Sign, shall not impair the performance of the Blankout Sign. The Blankout Sign shall not radiate any electrical or electromagnetic signals that could adversely affect any other electrical or electronic device.

1.2.2.1 LED Specifications

Use Red LEDs that are the latest Aluminum Indium Gallium Phosphide (AlInGaP) technology and White LEDs that are the latest Indium Gallium Nitride (InGaN) technology or better with a minimum luminous output requirement of 9,000 candelas per meter square when each discrete LED is driven at a current of 20 milliamperes. Install the ultra-bright type LEDs that are rated for 100,000 hours of elapsed time calendar hours use in an ambient temperatures, based on an average daily on-time usage factor of 11%, when driven at the specific forward current used for normal daylight LED Blankout Sign display.
operation. Distribute the LEDs evenly. Ensure that the maximum distance, center to center, between consecutive LEDs is 0.5 inches, plus or minus 10%. Connect the individual LED light sources so that failure of a single LED will result in a loss of no more than 5 LEDs. Protect and seal the rear side of the PCB with a molded polymeric back cover. Mount the display PCB with back cover into the front door, which consist of an aluminum frame and face lens.

The LED driver electronics shall not be mounted on the same board as the LED displays. The driver boards shall be easily disconnected from the LED display modules. Removal of any display module shall not affect the operation of the remaining modules.

1.2.2.2 Lens

Provide a clear, non-glare, mat finish polycarbonate lens with a UV resistant surface treatment and super abrasion resistant properties. Ensure that the lens has light transmission properties equal to or greater than 80%. The module shall be completely sealed against moisture and dust intrusion.

1.2.2.3 Dimming

Provide a photocell and dimming circuitry to automatically reduce the light intensity of the display by 35% based on the ambient light to reduce long term degradation of the LEDs. Include a 30-second delay to prevent interference caused by extraneous light.

1.2.2.4 Labels

Identify each Symbolic LED Module with the manufacturer's name, model number, serial number, date of manufacture, and lot number if applicable.

1.2.3 Packaging

Each single Symbolic Blankout Sign, complete with visor, and LED Symbolic module capable of displaying either a right or left arrow, as specified, completely assembled with mounting assembly and tether fastener, shall be packaged in a separate corrugated cardboard box. The box shall be clearly labeled on the END of the box, in plain English, as to what's contained therein. All packages shall be identified with the Department PURCHASE ORDER NUMBER. Packing lists and EQUIPMENT LABELS shall be glued to every carton showing its contents.

Each Symbolic LED Module shall be packaged in a separate corrugated cardboard box. The box shall be clearly labeled on the END of the box, in plain English, as to what's contained therein. All packages shall be identified with the Department PURCHASE ORDER NUMBER. Packing lists and EQUIPMENT LABELS shall be glued to every carton showing its contents.

1.2.4 Certification

CATALOG CUTS ARE REQUIRED

Provide written Certification from the manufacturer or Vendor that ITE Standards, MUTCD standards, and all the requirements of this specification have been met.

Samples shall be provided for Department approval if requested. The sample submitted shall be representative of typical average production units. Samples will not be returned unless requested by the vendor.
1.2.5 Warranty

During the period of SIXTY (60) MONTHS following the date of purchase, the Manufacturer or Vendor shall replace, at no expense to the Department (including shipping costs), any part of Symbolic LED Blankout Sign that fails by reason of defective material or workmanship.

Performance shall be warranted for a period of SIXTY (60) MONTHS of the date of purchase and shall include repair or replacement of a Symbolic LED NRT/NLT Module that exhibits light output degradation, which in the judgment of the department, cannot be easily seen at one hundred fifty feet (150') in bright sunlight with the visor on the housing or that drops below the luminous intensity output requirements of this specification. The vendor shall replace any failed modules within 30 calendar days of notification.

1.3 Measurement

Furnishing a No Right/Left Turn Symbolic LED Blankout Sign shall be measured by EACH with LED module installed, including ALL internal electrical and electronic hardware, structural materials, housings, and all the necessary hardware for proper mounting.

Furnishing a No Right/Left Turn Symbolic LED Module, measured by each, shall be complete with weather tight neoprene gasket for replacing defective existing modules if applicable.

1.4 Payment

Furnishing a No Right/Left Turn Symbolic LED Blankout Sign with LED module with span wire mount, measured as provided above, will be paid at the contract unit price bid for:

| FURNISH NO RIGHT/LEFT TURN SYMBOLIC LED BLANKOUT SIGN W/ SPAN WIRE MOUNTING | EA |

Furnishing a Symbolic LED module, measured as provided above, will be paid at the contract unit price bid for:

| FURNISH NO RIGHT/LEFT TURN SYMBOLIC LED MODULE | EA |
M688.3 VIDEO DETECTION SYSTEM

1.1 Description

This specification describes requirements for furnishing video detection system components with all necessary hardware and software and includes the Network Security Policy as part of this specification. A complete Video Detection System includes Camera, Camera Mounting Hardware, Camera Cable, CPU, Surge Arrestors, and Power Panel.

1.2 Materials

1.2.1 Video Imaging

Material and equipment furnished under this section must be pre-approved by SCDOT by the date of installation. Miscellaneous hardware such as cables and mounting hardware do not need to be pre-approved.

Ensure that software is licensed for use by SCDOT and by any other agency responsible for maintaining or operating system.

Design and furnish video detection systems that detect vehicles at signalized intersections by processing video images and providing detection outputs to the signal controller in real time (within 150 milliseconds of vehicle arrival).

Furnish all required camera sensor units, processor units, hardware and software packages, cabling, luminaire arms, harnesses, camera mounting assemblies, surge protection panels, grounding systems and all necessary hardware. Furnish systems that allow the display of detection zones superimposed on an image of the roadway on an SCDOT-furnished monitor or laptop computer screen. Ensure detection zones can be defined and data entered using a simple keyboard or mouse and monitor, or using a Windows® Xp (or newer) based laptop PC with software.

Provide design drawings showing design details and camera sensor unit locations for review and acceptance before installation. Provide mounting height and location requirements for camera sensor units on the design, based on site-survey. Design video detection systems with all necessary hardware. Indicate all necessary poles, spans, mast arms, luminaire arms, cables, camera mounting assemblies and hardware to achieve the required detection zones where SCDOT owned poles are not adequate to locate the camera sensor units. The vendor is responsible for the final design of video detection systems.

Review and acceptance of the designs by SCDOT does not relieve the vendor from the responsibility to provide fully functional systems and to ensure that the required detection zones can be provided.

Provide the ability to program each detection call with the following functions:

- Full Time Delay – Delay timer is active continuously,
- Normal Delay – Delay timer is inhibited when assigned phase is green (except when used with TS 2 and 170/2070L controllers),
- Extend – Call is extended for this amount of time after vehicle leaves detection area,
Delay Call/Extend Call – This feature uses a combination of full time delay and extend time on the same detection call. Ensure operation is as follows: Vehicle calls are received after the delay timer times out. When a call is detected, it is held until the detection area is empty and the programmed extend time expires. If another vehicle enters the detection area before the extend timer times out, the call is held and the extend timer is reset. When the extend timer times out, the delay timer has to expire before another vehicle call can be received.

Provide the ability to program each detection zone as one of the following functions:

- Presence detector,
- Directional presence detector,
- Pulse detector,
- Directional pulse detector.

Ensure previously defined detector zones and configurations can be edited.

Provide systems that allow for the placement of at least 8 detection zones within the combined field of view of a single camera sensor unit.

Provide a minimum of 4 detection outputs per processing unit. If additional outputs are needed, provide all necessary hardware to allow for additional calls to be placed to the Controller via the input file.

Provide detection zones that can be overlapped. Ensure systems reliably detect vehicles when the horizontal distance from the camera sensor unit to the detection zone area is less than ten times the mounting height of the sensor. Ensure systems detect vehicles in multiple travel lanes.

Ensure systems can detect vehicle presence within 98 to 102 percent accuracy (up to 2 percent of the vehicles missed and up to 2 percent of false detection) for all weather and lighting conditions, in the absence of occlusion.

SCDOT may conduct field-testing to ensure the accuracy of completed video detection systems.

1.2.2 Video Detection System

Furnish video detection systems that receive and simultaneously process information from camera sensor units, and provides detector outputs to signal controllers.

Ensure systems provide the following:

- Operate in a typical roadside environment and meet the environmental specifications and are fully compatible with NEMA TS 1, NEMA TS 2, or Type 170/2070L controllers and cabinets,
- provide a “fail-safe” mode whereby failure of one or more of the camera sensor units will cause constant calls to be placed on the affected vehicle detection outputs to the signal controller,
- provide compensation for minor camera movement of up to 2 percent of the field of view at 400 feet without falsely detecting vehicles,
- process the video at a minimum rate of 30 frames per second,
- provide separate wired connectors inside the controller cabinet for viewing each camera,

Furnish camera sensor units that comply with the following:

- have an output signal conforming to EIA RS-170 standard,
• have a nominal output impedance of 75 ohms,
• be immune to bright light sources, or have built in circuitry or protective devices to prevent
damage to the sensor when pointed directly at strong light sources,
• be housed in a light colored environmental enclosure that is water proof and dust tight, and that
conforms to NEMA-4 specifications or better,
• simultaneously monitor at least five travel lanes when placed at the proper mounting location with
a zoom lens,
• have a sunshield attached to the environmental enclosure to minimize solar heating,
• meet FCC class B requirements for electromagnetic interference emissions,
• have a heater attached to the viewing window of the environmental enclosure to prevent ice and
condensation in cold weather,
• have the Video Processing unit in the cabinet.

Where coaxial video cables and other cables are required between the camera sensor and other
components located in the controller cabinet, furnish surge protection in the controller cabinet.

Coaxial communications cable shall comply with the following, as recommended by the manufacturer:
• Belden 8281 or approved equivalent Number 20 AWG, solid bare copper conductor terminated
with crimped-on BNC connectors (do not use BNC adapters) from the camera sensor to the
signal controller cabinet.
• Belden 9259 or approved equivalent Number 22 AWG, stranded bare copper conductor
terminated with crimped-on BNC connectors (do not use BNC adapters) from the camera sensor
unit to the junction box, and within the signal controller cabinet.

Furnish power cable appropriately sized to meet the power requirements of the sensors. At a
minimum, provide three conductor 120 VAC field power cable.

As determined during the site survey, furnish sensor junction boxes with nominal 6 x 10 x 6 inches
dimensions at each sensor location. Provide terminal blocks and tie points for power cable.

1.2.1 Video Detection System Support

Furnish video detection systems with either a simple keyboard or a mouse with monitor and
appropriate software, or with system software for use on SCDOT-owned laptop PCs. Ensure the system
is Windows® 2000 compatible, or newer.

Provide Hardware and Windows® XP compatible (or newer) personal computer software, if
needed, to provide remote video and video detection monitoring via standard telephone line.

Provide each individual system with all the necessary equipment to focus and zoom the camera
lenses without the need to enter the camera enclosure.

Ensure systems allow the user to edit previously defined detector configurations. When a vehicle
is within a detection zone, provide for a change in color or intensity of the detection zone perimeter or
other appropriate display change on the monitor or laptop computer screen.

Provide cabling and interconnection hardware with 6-foot minimum length interconnection cable
to interface with the system.

Provide all associated equipment manuals and documentation.
1.2.2 Warranty

The Vendor shall furnish SCDOT with any warranties on equipment and materials that are provided by the Manufacturer or Vendor as normal trade practice.

1.3 Measurement

Furnishing Video Detection System components shall be measured as EACH unit.

Furnishing Video Detection Camera Cable shall be measured by LINEAR FEET and furnished in 500' REELS or 1000' REELS.

Furnishing Video Detection System On Site Training shall be measured by DAY.

1.4 Payment

Furnishing Video Detection System components, Cable, and On Site Assistance, measured as provided above, will be paid for at the contract unit price for:

<table>
<thead>
<tr>
<th>Item</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>FURNISH VIDEO DETECTION CPU</td>
<td>EA</td>
</tr>
<tr>
<td>FURNISH VIDEO DETECTION CAMERA</td>
<td>EA</td>
</tr>
<tr>
<td>FURNISH VIDEO DETECTION CAMERA MOUNTING HARDWARE</td>
<td>EA</td>
</tr>
<tr>
<td>FURNISH VIDEO DETECTION CAMERA CABLE – 1000’</td>
<td>1000’ REEL</td>
</tr>
<tr>
<td>FURNISH VIDEO DETECTION CAMERA CABLE – 500’</td>
<td>500’ REEL</td>
</tr>
<tr>
<td>FURNISH MONITOR WITH VIDEO CABLE</td>
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<tr>
<td>FURNISH VIDEO DETECTION ON SITE ASSISTANCE</td>
<td>DAY</td>
</tr>
<tr>
<td>FURNISH VIDEO DETECTION SURGE ARRESTORS</td>
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<tr>
<td>FURNISH VIDEO DETECTION POWER PANEL WITH BREAKER</td>
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</tr>
<tr>
<td>FURNISH VIDEO DETECTION LENS ADJUSTMENT MODULE</td>
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</table>

** Network Security Policy to follow on the next three pages:
Network Services Security Policy for network attached devices

This policy is subject to change at any time, as deemed necessary by Network Services and/or the ISO.

Last Update Status: Updated August 27, 2015

1. Overview
   See Purpose.

2. Purpose
   This document describes the required minimal security configuration for all networked devices connecting to a production network or used in a production capacity at or on behalf of South Carolina Department of Transportation (SCDOT).

3. Scope
   All employees, contractors, consultants, temporary and other workers at SCDOT and its subsidiaries must adhere to this policy. All networked devices connected to SCDOT production networks are affected.

4. Policy
   Every active network device must meet the following operational standards (if applicable):

   1. No local user accounts are configured on the network device. Network devices must use TACACS+ /Radius/AD for all user authentication.
   2. The super user password on the network device must be kept in a secure encrypted form. The network device must have the super user password set to the current production network device password from the device's support organization.
   3. The following services or features must be disabled:
      a. IP directed broadcasts
      b. TCP small services
      c. UDP small services
      d. All source routing and switching
      e. Any discovery protocols on Internet connected interfaces
      f. Telnet, FTP, and HTTP services
      g. Auto-configuration
   4. The following services should be disabled unless a business justification is provided:
      a. Cisco discovery protocol and other discovery protocols
      b. Dynamic trunking
      c. Scripting environments, such as the TCL shell
   5. The following services must be configured:
      a. Password-encryption
      b. NTP configured to a corporate standard source
   6. Any routing updates shall be done using secure routing updates.
   7. Support for SNMPV3. Use corporate standardized SNMP community strings. Default strings, such as public or private must be removed. SNMP must be configured to use the most secure version of the protocol allowed for by the combination of the device and management systems.
   8. Access control lists must be used to limit the source and type of traffic that can terminate on the device itself.
9. Access control lists for transiting the device are to be added as business needs arise.
10. The network device must be included in the corporate enterprise management system with a designated point of contact.
11. Each network device must have the following statement presented for all forms of login whether remote or local:

**WARNING TO USERS**

This computer system is the property of the South Carolina Department of Transportation (SCDOT) and may only be accessed by authorized users. Unauthorized access, use, misuse, or modification of this computer system or of the data contained herein or data in transit to/from this system constitutes a violation of Title 18, United States Code, Section 1030. SCDOT shall monitor system usage for unauthorized activities. You should have no expectation of privacy in your use of this network, including information stored locally on the hard drive or other media in use with this unit (e.g., floppy disks, USB drives, PDAs and other hand-held peripherals, CD-ROMs, etc.) Any or all activity of this system may be intercepted, monitored, recorded, copied, audited, or inspected by authorized SCDOT personnel. Improper use or criminal activity can lead to administrative disciplinary actions as well as civil and criminal penalties.

ANYONE USING THIS SYSTEM EXPRESSLY CONSENTS TO SUCH MONITORING. LOG OFF OR DISCONNECT IMMEDIATELY IF YOU DO NOT AGREE TO THE CONDITIONS STATED IN THIS WARNING

12. Telnet may never be used across any network to manage a router, unless there is a secure tunnel protecting the entire communication path. SSH version 2 is the preferred management protocol.
13. Any dynamic routing protocols (if any) must use authentication in routing updates sent to neighbors. Password hashing for the authentication string must be enabled when supported. Password will be provided by the SCDOT
14. The network device configuration standard will define the category of sensitive routing and switching devices, and require additional services or configuration on sensitive devices including:
   a. IP access list accounting
   b. Device logging
   c. Incoming packets at the router sourced with invalid addresses, such as RFC1918 addresses, or those that could be used to spoof network traffic shall be dropped
   d. Router console and modem access must be restricted by additional security controls

5. **Policy Compliance**

5.1 Compliance Measurement
The InfoSec team will verify compliance to this policy through various methods, including but not limited to, periodic walk-thrus, video monitoring, business tool reports, internal and external audits, and feedback to the policy owner.
5.2 **Exceptions**
Any exception to the policy must be approved by the InfoSec team in advance.
5.3 **Non-Compliance**
An employee found to have violated this policy may be subject to disciplinary action, up to and including termination of employment.
6 Related Standards, Policies and Processes
None.

7 Definitions and Terms
None.

8 Revision History

<table>
<thead>
<tr>
<th>Date of Change</th>
<th>Responsible</th>
<th>Summary of Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>August 1, 2015</td>
<td>NS Policy Team</td>
<td>Reviewed and accepted</td>
</tr>
<tr>
<td>August 27, 2015</td>
<td>NS Policy Team</td>
<td>Reviewed and accepted</td>
</tr>
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M688.5 STEEL STRAIN POLE AND FOUNDATION

1.1 Description

This specification describes requirements for furnishing a Steel Strain Pole, of the sizes and colors specified. Anchor bolts and all miscellaneous hardware shall be supplied with each pole as required.

All anchor bolt nuts, caps, pole clamps, and miscellaneous pole hardware shall be BAGGED IN BURLAP for each pole during shipping. In addition, individual parts shall also be furnished as specified.

1.2 Materials

1.2.1 General

ALL STEEL STRAIN POLES PROVIDED FOR ANY INDIVIDUAL PROJECT SHALL BE FROM THE SAME MANUFACTURER.

Each Steel Strain Pole Assembly shall consist of:
   1. A steel Shaft.
   2. A steel Anchor Base.
   3. Four steel Anchor Bolts with eight nuts,
   4. A removable top plate which will bolt to the shaft with a ¼” J-Bolt and attached to a ½” bar that is welded inside the shaft,
   5. Four removable anchor bolt Covers,
   6. Two adjustable heavy duty Pole Clamps, and
   7. Miscellaneous hardware as specified.

1.2.2 Pole Materials

1.2.2.1 Shaft

The design of the shaft will be based on minimum mill certified 55,000 yield strength steel. One of the following steel must be used in the fabrication of the shaft: American Society for Testing and Materials (ASTM): A570-50, ASTM A572-50, ASTM A572-60, ASTM A607-50, ASTM A607-55, ASTM A607-60, ASTM A595-A or ASTM A595-B.

Only one (1) longitudinal weld, and no transverse welds, shall be permitted.

After being formed and welded, the Shaft shall then be longitudinally cold-rolled with sufficient pressure to flatten the weld. Break formed, (multi-sided) poles shall have a minimum of eight (8) sides and a guaranteed mill certified minimum yield of 55,000 Pounds per square inch (PSI).

The Shaft shall have a uniform taper in diameter from base to top of 0.14” per foot. The minimum base diameter and length shall be as specified in the Dimensions Chart.

A reinforced hand hole, complete with frame and cover with a minimum size of 4” x 6 1/2”, shall be welded into the Shaft approximately 12” above the base plate at 0 degrees. The frame shall be tapped with a 1/2” - 13 Unified Thread Standard (UNC) for a grounding bolt. Stainless-steel hardware shall be supplied.

A J-hook wire support shall be welded inside near the top of the Shaft.

Round holes shall be provided in EVERY POLE as follows:
3" diameter hole, at 6" on-center below pole TOP; at 0 degrees (above hand hole).
3" diameter hole, at 6" on-center below pole TOP; at 270 degrees (orientate counter-clockwise).
3" diameter hole, at 15 ¼" on-center above pole BOTTOM; at 90 degrees (orientate counter-clockwise).
1" diameter hole, at 35" on-center above pole BOTTOM; at 270 degrees (orientate counter-clockwise).
1" diameter hole, at 35" on-center above pole BOTTOM; at 90 degrees (orientate counter-clockwise).

The two (2) 3" upper holes are for installing weatherheads w/nipple and the lower 3" hole is to permit the installation of a pole mounted Controller Cabinet. A 3" threaded, half-blind coupling shall be FACTORY WELDED, to the pole surface and protrude ¼" in each hole. The two (2) 1" diameter holes are for mounting the electrical service. These holes shall have a 1" threaded half-blind coupling FACTORY WELDED, to the pole surface and shall be flush mounted. The entire pole coupling shall then be hot dipped galvanized.

1.2.2.2 Anchor Base and Flange Plates

The Anchor Base and flange plates shall be made from ASTM A36 steel.

The Anchor Base shall be square (with rounded corners), and shall be of the size and thickness specified in the DIMENSIONS TABLE below.

The Anchor Base shall be provided with four (4) holes to accept Anchor Bolts. The size of the holes and the bolt circle shall be as specified in the DIMENSIONS TABLE below.

Tapped holes shall be provided for attaching removable Anchor Bolt covers, which shall be provided with stainless steel hex-head bolts.

The Anchor Base shall telescope the Shaft, and shall be secured to the Shaft by two fillet welds. One weld shall be on the inside of the base at the end of the Shaft, and the other shall be on the outside at the top of the base. The welded connection shall develop the full strength of the adjacent cross-section to resist bending action.

1.2.2.3 Anchor Bolts and Nuts

Anchor Bolts shall be steel rods of ASTM A-36 M-55, modified to have a minimum yield point of 55,000 PSI.

Four (4) Anchor Bolts shall be supplied with each pole. The Anchor Bolt size shall be specified in the Dimensions Chart.

Each Anchor Bolt shall be threaded at the top for 10", and shall have a 6" L-bend at the bottom, or a bearing plate as specified on larger pole sizes.

A total of eight (8) nuts and eight (8) flat washers shall be supplied and installed for each pole. Nuts shall be ASTM 563 Grade A. The two (2) nuts per bolt may be either:
- two (2) hex nuts (preferred), or
- one (1) hex nut and one square nut (acceptable).

Note: All other bolts shall be ASTM A325 or A307, (threaded per UNC series).

1.2.2.4 Pole Cap or Top Plate
Each pole shall be supplied with a Cap or top which shall be made from 7 GA. Galvanized steel or from cast aluminum, ASTM B-108; Alloy 356.OT6.

The Pole Cap shall be of a size greater than the pole top diameter and designed to prevent water from entering the top of the pole.

1.2.2.5 Bolt Cover

With each Pole there shall be supplied four (4) removable bolt covers capable of hiding the installed Anchor Bolts and the top nut. The covers shall have a clean-lined modern appearance. They shall attach to the pole with stainless-steel hex-head bolts. Acorn nuts are also acceptable.

1.2.2.6 Pole Clamp

With each Strain Pole there shall be supplied two (2) adjustable Span Wire Clamps. Each span wire clamp shall be constructed of 1/4” x 3” steel minimum, complete with two 7/8” x 4” stud bolts including two (2) lock washers and two (2) hex nuts per stud bolt. Each span wire clamp shall also include a clevis complete with a 7/8” x 3” bolt with one (1) lock washer and one (1) hex nut.

1.2.2.7 Pole Plugs

Plugs, either galvanized or stainless, shall be supplied for all holes in the steel pole. Plugs shall be installed in all un-used holes in the steel pole in a construction project.

1.2.2.8 Foundation Rebar Cage

See Standard Drawing, Poles, 675-115-02 for Foundation Cage details or separate drawing from Standard Drawing, Poles, 675-115-02 as part of this specification. http://www.scdot.org/doing/technicalPDFs/standardDrawings/675-000-00.pdf

1.2.3 Dimensions

Strain Poles shall be supplied on a per EACH basis, with dimensions in accordance with the following table:

<table>
<thead>
<tr>
<th>DIMENSIONS TABLE</th>
<th>GALVANIZED STEEL SHAF</th>
<th>GALVANIZED STEEL PLATE BASE</th>
<th>ANCHOR BOLTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>Diameter at Base</td>
<td>Length</td>
<td>Mfr’s Standard Gauge</td>
</tr>
<tr>
<td>13” X 26’</td>
<td>13”</td>
<td>26’</td>
<td>#3 gauge</td>
</tr>
<tr>
<td>13” X 28’</td>
<td>13”</td>
<td>28’</td>
<td>#3 gauge</td>
</tr>
<tr>
<td>13” X 32’</td>
<td>13”</td>
<td>32’</td>
<td>#3 gauge</td>
</tr>
</tbody>
</table>

1.2.4 Other Materials

All other hardware or components shall be made of a non-corrosive material, or be of the same material as the item being installed.

1.2.4.1 Concrete
The concrete used in the pole base, shall conform to the requirements of SCDOT STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION, Section 701, 702, 703, and 704. The concrete shall be CLASS 5000, with “WATER-REDUCER ADMIXTURE”, installed in ONE MONOLITHIC POUR, with VIBRATION.

1.2.4.2 Reinforcing Steel

Steel reinforcement shall conform to the requirements of DOT STANDARD SPECIFICATIONS, Section 703.2.1, which is amended to include the following:

“All references to AASHTO M 31 or ASTM A 615 are hereby deleted and replaced by ASTM A 706 with a single minimum yield strength level of 60,000 psi, designated as Grade 60.”

The bars shall be of the size and type shown on the Design Details or in the Standards.

1.2.4.3 Conduit Elbow

Conduit Elbows shall be in accordance with FURNISH AND INSTALL ELECTRICAL CONDUIT. Conduit Elbows in pole bases shall be PVC, of the size and type shown on the Plans. As a minimum, THERE SHALL BE AT LEAST 1 CONDUIT ELBOW (2 INCH PVC ELBOW) IN EACH POLE BASE.

1.2.4.4 Ground Rod

Ground rods shall be 5/8 inch by 8 feet (minimum) Copper-Clad. A No. 6 AWG bare, stranded copper wire shall be used in the ground connection. EACH STRAIN POLE SHALL HAVE 1 GROUND ROD.

1.2.4.5 Pole Plugs

Plugs/Caps, either galvanized or stainless, shall be installed in all un-used holes in steel pole.

1.2.4.6 Miscellaneous

All other hardware or components shall be made of a non-corrosive material, or be of the same material as the item being installed.

1.2.5 Galvanizing

The following shall be hot-dipped galvanized to ASTM A-123:

- Shaft, Anchor Base, nuts, and hand hole frame and cover, the top 12” of the Anchor Bolts, Pole Clamp, and all other steel or iron parts.

1.2.6 Powder Coating Over Base (Optional)

Powder Coating over base shall be an option. The finish color shall be specified at the time of ordering. The following shall be powder coated: Shaft, anchor base, nuts, hand hole frame and cover, the top 12” of the anchor bolts, pole clamp, and all other steel or iron parts.

1.2.7 Powder Coating Over Galvanized (Optional)

Powder Coating over galvanized shall be an option. The finish color shall be specified at the time of ordering. The following shall be powder coated after they have been hot-dipped galvanized: Shaft, anchor base, nuts, hand hole frame and cover, the top 12” of the anchor bolts, pole clamp, and all other steel or iron parts.
1.2.8 Pole Labeling

Every Pole shall be easily read and prominently labeled on the outside edge of the base plate. The method used shall be that the pole description is inscribed with "WELDING-BEAD", neatly hand-written, in 1-1/2" to 2" high letters. The legend used shall be one of the following:

- 13" X 26'
- 13" X 28'
- 13" X 32'

Note: Codes shall not be acceptable for pole size labeling. The welding bead shall be applied prior to galvanizing.

In addition to the welding bead identification every pole shall have a metal “Builders Plate” (name plate) with raised or stamped letters stating the manufacturer, the date of manufacture, lot number, the length and diameter of the pole and a ID number. The name plate shall be welded to the outside pole wall about 5’ above the base at 0 degrees. Color Coding shall be included on each plate to facilitate ease of selection and identification.

1.2.9 Design and Drawings

The Vendor shall furnish pole design details and shop-drawings in sufficient detail for complete evaluation and comparison with these Specifications. Any exceptions to these Specifications must be stated in writing.

1.2.10 Quality Control, Testing, Certification

Where required, materials must be in full compliance with AASHTO and ASTM in effect on the date of advertisement.

Performance Testing - SCDOT reserves the right to receive on demand a test report from an independent laboratory certifying that the equipment furnished meets these specifications, at no costs to the Department. The bidder shall also provide a certification from the manufacturer that all strain poles shall have a guaranteed minimum yield strength, (mill certified), of 55,000 PSI.

Rejection - SCDOT reserves the right to reject an entire shipment of poles covered by this specification and project, if ten percent (10%) or more are found to be defective within a thirty (30 day period following receipt of materials.

1.2.11 Packaging

For Anchor Bolts – To preserve the threads, to help improve stock yard inventory procedures, and to enhance loading/unloading of the shipment, the Anchor Bolts (for either a pole shipment or as spares) shall be packaged and mounted on a pallet with four (4) anchor bolts across and four (4) levels high. Each layer should lay opposite so that the six inch bend protects the threaded end of the next level.

For Pole Hardware – To help improve stock yard inventory procedures, and to make outside storage possible, all anchor bolt hardware and all pole hardware for each pole shall be included in ONE (1) BURLAP BAG. No cardboard boxes shall be permitted. The bag shall contain the nuts, washers, pole cap, pole covers, pole clamps, pole plugs and all associated hardware. The bag shall be placed inside each steel pole.

If necessary, the bag shall be labeled by pole size if smaller clamps are needed for the 26’ poles.

1.2.12 Delivery
SCDOT pickup from Vendor or Supply Depot is an option and will be specified at the time of the order.

Shipment for the poles shall be made via open-bed truck to facilitate unloading. Delivery shall be made to the SCDOT Supply Depot, 1418 Shop Road, Columbia, SC or one of seven District Signal Shops. Notice shall be given to the supervisor at the supply depot (803-737-6631) or the District Signal Shop at least two (2) working days in advance, as to the date of shipment, and expected delivery date to the supply depot. Vendor must have lay down yard and means to load poles on site in South Carolina for SCDOT pickup. Vendor to keep eight (8) 28’ steel poles and eight (8) 32’ steel poles with hardware in stock at all times for rapid use.

**1.2.13 Manufacturer/Supplier**

Poles must be manufactured within the United States at a facility solely owned by a company incorporated in the United States. Steel used shall comply with current Federal laws limiting foreign steel.

**1.2.14 Warranty**

The Manufacturer or Contractor shall warrant the poles and all associated hardware to be free from defects in material and workmanship for a period of two (2) years from date of shipment. Any defects within this period shall be repaired or replaced by the Contractor, at total cost to the Manufacturer or Contractor, including labor, parts and transportation.

**1.3 Measurement**

Furnishing Steel Strain Poles, will be measured by each, of the size(s) specified, anchor bolts, nut covers, pole cap, reinforcing steel, ground rod, ground wire, and all miscellaneous hardware as required.

**1.4 Payment**

Furnishing Steel Strain Poles, accepted, and measured as above, will be paid for at the contract unit price bid for:

<table>
<thead>
<tr>
<th>Description</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>FURNISH 13&quot; X 26' STEEL STRAIN POLE</td>
<td>EA</td>
</tr>
<tr>
<td>FURNISH 13&quot; X 26' STEEL STRAIN POLE (POWDER COATED OVER BASE)</td>
<td>EA</td>
</tr>
<tr>
<td>FURNISH 13&quot; X 26' STEEL STRAIN POLE (POWDER COATED OVER GALVANIZED)</td>
<td>EA</td>
</tr>
<tr>
<td>FURNISH 13&quot; X 28' STEEL STRAIN POLE</td>
<td>EA</td>
</tr>
<tr>
<td>FURNISH 13&quot; X 28' STEEL STRAIN POLE (POWDER COATED OVER BASE)</td>
<td>EA</td>
</tr>
<tr>
<td>Description</td>
<td>Unit</td>
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<tr>
<td>----------------------------------------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>FURNISH 13&quot; X 28' STEEL STRAIN POLE (POWDER COATED OVER GALVANIZED)</td>
<td>EA</td>
</tr>
<tr>
<td>FURNISH 13&quot; X 32' STEEL STRAIN POLE</td>
<td>EA</td>
</tr>
<tr>
<td>FURNISH 13&quot; X 32' STEEL STRAIN POLE (POWDER COATED OVER BASE)</td>
<td>EA</td>
</tr>
<tr>
<td>FURNISH 13&quot; X 32' STEEL STRAIN POLE (POWDER COATED OVER GALVANIZED)</td>
<td>EA</td>
</tr>
</tbody>
</table>
1.1 Description

This specification describes requirements for furnishing pre-stressed Concrete Strain Poles, of the sizes specified. These poles shall be of the type intended for direct embedding, with the hole back filled with concrete.

The following covers the design and fabrication of pre-stressed concrete strain poles, to be used for supporting steel cable suspended traffic signals or supporting lane control signs.

1.2 Materials

1.2.1 General

ALL CONCRETE STRAIN POLES PROVIDED FOR ANY INDIVIDUAL PROJECT SHALL BE FROM THE SAME MANUFACTURER.

Each Concrete Strain Pole assembly shall consist of:
1. A round pre-stressed hollow concrete shaft,
2. A pole cap, and
3. Miscellaneous hardware as specified.

The poles shall meet or exceed the specifications stated in the latest publication of “American Association of State Highway and Transportation Officials” (AASHTO); “Standard Specifications For Structural Supports For Highway Signs, Luminaires And Traffic Signals” and in particular, “Pre-Stressed Concrete Design”. Stress in concrete due to pre-stressing shall be within the limits stated in the AASHTO Standard. Loss of pre-stress shall be calculated using AASHTO methods. Further, the manufacturer shall provide documentation showing the permeability/water-absorption of their product. Other procedures shall be according to the American Concrete Institute (ACI).

Poles shall be designed and constructed so that all wiring and grounding facilities are concealed within the hollow poles. All hand holes, wire inlets/outlets, inserts for pole steps, through bolt holes and the ground wire shall be cast into the pole during the manufacturing process. NO FACTORY NOR FIELD DRILLING SHALL BE ALLOWED AFTER THE POLES HAVE BEEN STRIPPED FROM THEIR MOLDS.

Poles shall be designed in accordance with the following requirements, to provide the Mandatory Ultimate Ground Line Moment and with the cable attachment heights stated below. As given, the design shall assume:

<table>
<thead>
<tr>
<th>OVERALL POLE LENGTH</th>
<th>EMBEDMENT (below ground line)</th>
</tr>
</thead>
<tbody>
<tr>
<td>35 feet</td>
<td>8 feet</td>
</tr>
<tr>
<td>40 feet</td>
<td>10 feet</td>
</tr>
<tr>
<td>45 feet</td>
<td>11 feet</td>
</tr>
</tbody>
</table>

The Defined Attachment Height = Overall Pole Length – Embedment. The design shall assume a worst case strain (pull) of 22,200 Newtons (5000 pounds force) applied at the top of the pole (the design Defined Attachment Height).
Poles shall be designed using the South Carolina Department of Transportation (SCDOT) design method. A worst case application of AASHTO and ACI “Ultimate Strength Design” has been used. M is moment, T is torsion, U is ultimate.

The formula used: \( \frac{1.25 \cdot M}{\phi Mu} + \left( \frac{1.25 \cdot T}{\phi Tu} \right)^2 \leq 1.0 \). The contribution of torsion was neglected. A \( \phi \) of 0.90 was used. Substituting gives \( Mu > \left( \frac{1.25}{0.9} \right) \cdot M \) or \( Mu > 1.39 \cdot M \). We increased the 1.39 multiplier by 7 percent, to allow for torsion, fatigue and possible accidental vehicle damage.

Design Formula: \( Mu > 1.5 \cdot M \)

### 1.2.2 Pole Materials

#### 1.2.2.1 Concrete

The concrete mix shall be designed to achieve a minimum twenty-eight (28) day compressive strength (f’c) of 58,650 kPa (8,500 psi) Pounds per square inch. Cement shall conform to the latest requirement of Type I or Type III Portland cement in accordance with ASTM C-150. The maximum size aggregate may be is 19 mm (Millimeter). (3/4 inch) or (¾”) of the clear spacing between the main reinforcing steel and the surface of the pole. Any water reducers, retarders or accelerating admixture used shall conform to ASTM C-494. The water used shall be free from foreign materials in amounts harmful to concrete or embedded steel. The compressive strength at release of pre-stress (f’ci) shall be 31,050 kPa (4,500 psi).

#### 1.2.2.2 Reinforcing Steel

**NO** deformed steel reinforcement (ASTM A-615) shall be used in the manufacturing process.

#### 1.2.2.3 Pre-stressing Steel

Pre-stressing steel stranded rope cable, which shall conform to uncoated 12.7 mm (0.5 inch), 7 wire, stress relieved strand (including low relaxation) of 1,201,500 Newtons (270,000 pound strain) grade, ASTM A-416. The minimum number of strands shall be eight (8) strands.

#### 1.2.2.4 Spiral Reinforcement

Steel wire spiral reinforcement shall conform to ASTM A-82 and shall be of minimum diameter 0.150”. The pitch of the spiral reinforcement shall be on 2” centers for the first and last 3’ of the pole, and 6.5” centers for the remaining portion of the pole. These requirements are more stringent than AASHTO.

#### 1.2.2.5 Hardware

All structural steel shall conform to ASTM A-36 and be hot-dip galvanized per ASTM A-123. Hand hole frames and covers and all inserts shall be zinc alloy AC41A, ASTM B-240. All bolts, nuts, washers and other fasteners shall be stainless steel or be hot-dip galvanized per ASTM A-153.

### 1.2.3 Manufacturing

All manufacturing tolerances, details of reinforcement and finishes shall be in accordance with the latest specification for pre-stressed concrete poles, as published in the “Journal Of The Pre-Stressed Concrete Institute”.

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**M688.6 FURNISH CONCRETE STRAIN POLE**

Page 2
All poles shall be pre-stressed and be manufactured by the centrifugal spinning process using a mold. The purpose of this requirement is to insure a minimum twenty-eight (28) day compressive strength of 8,500 psi, and to provide the densest possible surface finish.

Forms shall be designed to provide a continuous outside taper of 0.180” per foot of length. Forms shall also provide a minimum of 1” of concrete cover over the pre-stressing strands.

Poles shall have a smooth, natural form finish, concrete soft gray in color (no dyes or stains).

Poles shall be round in cross section, with a hollow center and shall be of one piece construction.

All excess concrete shall be removed from inside of pole before delivery.

Poles shall not have any exposed steel at either top or the butt end. Steel strands, both top and butt end, shall be burned back a minimum of 0.75” and the resulting hole shall be completely sealed with epoxy.

Pole bottom ends shall be plugged with 12” of concrete at the butt end, which shall also have a 2” diameter drain hole through that plug.

1.2.4 Pole Features

Contact the Traffic Signal & Systems Engineer at (803) 737-1050 for: “Standard Drawing 675-115-02” for the height and compass orientation of pole features; and “Typical Concrete Pole Orientation” for intended usage.


Each pole shall include the features listed below.

1.2.4.1 Pole Cap

Each pole shall be supplied with a pole cap or top, which shall be made of plate aluminum. (Galvanized steel is NOT acceptable.)

1.2.4.2 Wire Support

A wire support consisting of a diametric reinforcing bar shall be cast inside the pole about 6” from the top. This bar can also be used to anchor the pole cap if necessary.

1.2.4.3 Upper Hand hole

A reinforced hand hole frame, complete with flush cover, with a minimum size of 3.5” x 8”, shall be cast into pole approximately (1’-2”) from the top of pole at 270°. (Orientate counter-clockwise)

1.2.4.4 Couplings

For weather head installation and entrance of the electrical cables, two (2) 2” I.D. conduit couplings shall be cast into the pole at 0° and 90° (orientate counter-clockwise) approximately (1’-2”) from the top of pole and one (1) 2” I.D. conduit coupling (2’-10”) from the top of the pole at 0°.

1.2.4.5 Through-Holes
Through-holes, for attaching steel span cable using appropriate through-bolt hardware, shall be at 0°, 90°, 180°, and 270°. The upper holes should be approximately (1'-10") from the top of pole and the lower holes should be approximately (2'-4") from the top of the pole. **NO PVC** (Polyvinyl chloride) is required in holes so that each level of span wire through bolt hardware can be used in multiple directions.

1.2.4.6 Grounding

A No. 4 AWG stranded copper ground wire shall be cast into each pole and be attached to the pre-stressed steel by bonding connectors. The embedded ground wire shall be terminated near the top of the pole and at a point near the bottom, approximately 9” below the ground line. Both terminations shall be made to a “copper tank ground” which provides a 0.5” tapped insert on the pole face for grounding attachment to spans wires at the top and to the driven ground rod at the base.

1.2.4.7 Pedestrian Features

For possible pedestrian signal head assembly, each pole shall have four (4) 1” holes for wiring the signals that will be banded onto the pole at a height 10’ above the ground line at 0°, 90°, 180°, and 270°.

For possible pedestrian push buttons, each pole shall have four (4) 1” holes for wiring a push button that will be banded onto the pole at a height 3.5 feet above the ground line at 0°, 90°, 180°, and 270°.

1.2.4.8 Pole Labeling

Every pole shall have an embedded “Builders Plate” (name plate) of brass or aluminum with raised or stamped letters stating the manufacturer, the date of manufacture, lot number, the length and diameter of the pole and the ultimate ground line moment capacity. The name plate shall be cast into the outside pole wall about 5’ above the ground line.

1.2.4.9 Rousting Holes

A 1.5” “CANT” hole, completely through the pole and lined with PVC conduit shall be cast into each pole at a height 4’ above ground line. The purpose shall be to permit inserting a pry-bar to turn the pole for proper orientation with the intersection.

There shall also be a Pick-Up point hole at the defined distances from the top of the pole found on the “Concrete Pole Openings, Thru-Bolts & Couplings”.

1.2.4.10 Lower Hand Hole

The compass location of the hand hole defines the zero (0) degree point. Each pole for traffic signal support shall have a reinforced hand hole frame, complete with flush cover, with a minimum size of 3.5” x 8.5”, shall be cast into the pole approximately 1.5 feet above the ground line.

1.2.4.11 Pole Mounted Cabinet

For possible controller cabinet installation, (2) 3” I.D. conduit couplings shall be cast into the pole at 90° and 270° 1.5 feet from the ground line. (**Note: These couplings flank the lower hand hole**)

1.2.4.12 Underground Conduit Entrance
In each signal pole, there shall be cast in two (2) rectangular underground cable entrance openings (conduit entry hole) at 0° and 270° minimum size of 4” x 10”, the top of which shall be located 1.5 feet below the ground line.

1.2.4.13 Pull Rope/Wire

The manufacturer shall furnish inside each pole a nylon or polypropylene rope or stainless steel wire so electrical wires may be pulled in installed pole. The rope or wire shall extend from the conduit opening near the base to the top of the pole.

Other Materials

Other materials shall meet the following requirements:

1.2.5.1 Concrete

The concrete used to embed the pole shall conform to the requirements of SCDOT STANDARD SPECIFICATIONS, Section 701, 702, 703, and 704. The concrete shall be Class 3000 and installed in ONE MONOLITHIC POUR, with VIBRATION.

1.2.5.2 Conduit Elbow

Conduit elbows shall be in accordance with furnish and install electrical conduit. Conduit elbows in pole bases shall be PVC of the size and type shown on the plans. If no other conduit is shown as a minimum, there shall be at least one (1) 2 inch PVC conduit elbow placed in each pole base.

1.2.5.3 Ground Rod

Ground rod(s) shall be 16 mm by 2.4 meters (5/8 inch by 8 feet) (minimum) copper clad. A No. 6 AWG bare stranded copper wire shall be used in the ground connection. EACH STRAIN POLE SHALL HAVE AT LEAST ONE (1) GROUND ROD.

1.2.5.4 Miscellaneous

All other hardware or components shall be made of a non-corrosive material or be of the same material as the item being installed.

1.2.5.5 Reinforcing Steel

Not usually needed for a concrete pole.

1.2.5 Design and Drawings

Prior to being approved for fabrication, the Contractor shall furnish from the manufacturer to the Engineer, complete stress computations, calculations, pole design details and design drawings in sufficient detail for complete evaluation and comparison with these Specifications. These submittals shall indicate the dimensions and shape of all individual structural and electrical features, their relative location on each pole and their relationship with each other. Drawings shall be made as close to scale as possible and with all details large enough to be self-explanatory. Any exceptions to these Specifications must be stated in writing. When computer programs have been used during the design process, the printouts of the programs or a copy thereof shall be provided to the engineer.
1.2.6 Certification

CATALOG CUTS ARE REQUIRED

The Vendor or Manufacturer shall provide documentation stating the permeability and/or water absorption of their concrete pole.

The Vendor shall provide a written certification from the intended manufacturer that all components of strain poles provided under this item have been designed and manufactured in complete accordance with these specifications and the approved design drawings, including the strength of the concrete. The certification letter shall be signed by an officer of the company.

Poles must be manufactured within the United States at a facility solely owned by a company incorporated in the United States. The manufacturer must have a minimum of ten (10) years’ experience in the design and production of centrifugally spun concrete poles shall have a full time registered professional engineer on staff. Steel used shall comply with current Federal laws limiting foreign steel.

1.2.7 Quality Control, Testing, Certification

Where required, materials must be in full compliance with AASHTO and ASTM in effect on the date of advertisement.

By furnishing poles for SCDOT, the manufacturer implicitly grants the right of entry and inspection of the manufacturing facility to the Engineer (or designated representative) of SCDOT. If requested, each of the component materials involved in the production of these poles must be sampled, tested and approved by the SCDOT Materials Laboratory prior to the start of production. In addition the total production process, including curing, shall be subject to inspection and approval.

SCDOT, at the discretion of the Engineer, may direct that one (or more) randomly chosen poles shall be shipped directly to a testing facility other than the depot. This may be one of the SCDOT Materials Laboratories or an independent testing facility. There, the pole may be tested to destruction. This “test pole” shall be paid for at the contract unit price.

The Vendor shall furnish a Certification from the Manufacturer or Vendor, that the Steel Cable has been tested to meet or exceed the required tensile strength.

1.2.8 Delivery

SCDOT or Contractor pickup from Vendor or Supply Depot is an option and will be specified at the time of the order.

Shipment for the poles shall be made via open-bed truck to facilitate unloading. Delivery may be made to the SCDOT Supply Depot, 1418 Shop Road, Columbia, SC or any location specified in the state of South Carolina. Notice shall be given to the supervisor at the supply depot (803-737-6631) at least two working days in advance, as to the date of shipment, and expected delivery date to the supply depot. Logistics for direct deliveries to locations other than the Supply Depot will be the responsibility of the vender.

Concrete strain poles shall be delivered to a location specified at the time of ordering. Delivery time shall be no later than thirty (30) calendar days. Any material received that does not meet these specifications will be returned at the expense of the vendor or manufacturer.
1.2.9  Manufacturer/Supplier

Poles must be manufactured within the United States at a facility solely owned by a company incorporated in the United States. Steel used shall comply with current Federal laws limiting foreign steel.

1.2.10  Warranty

The Manufacturer or Vendor shall warrant the poles and all associated hardware to be free from defects in material and workmanship for a period of two (2) years from date of shipment. Any defects within this period shall be repaired or replaced by the Manufacturer or Vendor, at total cost to the Manufacturer or Vendor, including labor, parts and transportation.

1.3  Measurement

Furnishing Concrete Strain Poles will be measured by EACH of the length specified. This shall include pole cap and all miscellaneous hardware as required.

1.4  Payment

Furnishing Concrete Strain Poles accepted and measured as above, will be paid for at the contract unit price.

| 35’ CONCRETE PRE-STRESSED POLE ASSEMBLY | EA |
| 40’ CONCRETE PRE-STRESSED POLE ASSEMBLY | EA |
| 45’ CONCRETE PRE-STRESSED POLE ASSEMBLY | EA |
| ALUMINUM POLE CAP | EA |
| HAND HOLE COVERS | EA |
# M688.7 CONTROLLER AND CABINET ASSEMBLY

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Unit</th>
<th>Estimated Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Controller Model 2070 Controller</td>
<td>Each</td>
<td>500</td>
</tr>
<tr>
<td>2</td>
<td>Cabinet Assembly (larger) Model 332A</td>
<td>Each</td>
<td>350</td>
</tr>
<tr>
<td>3</td>
<td>Cabinet Assembly (smaller) Model 336S</td>
<td>Each</td>
<td>100</td>
</tr>
<tr>
<td>4</td>
<td>Conflict Monitor Model 2018 ECL-ip</td>
<td>Each</td>
<td>250</td>
</tr>
<tr>
<td>5</td>
<td>Conflict Monitor Model 2010 ECL-ip</td>
<td>Each</td>
<td>250</td>
</tr>
<tr>
<td>6</td>
<td>Red Enable Board</td>
<td>Each</td>
<td>200</td>
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<td>7</td>
<td>Load Switch Model 200 (SSS-87IO)</td>
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<td>8</td>
<td>DC Isolator EDI Model 242</td>
<td>Each</td>
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</tr>
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<td>9</td>
<td>Flash Transfer Relay Model 430</td>
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<td>10</td>
<td>Loop Detector Amplifier, LCD Enhanced/Intelligent</td>
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<td>500</td>
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<td>Loop Detector Amplifier Model 222</td>
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<td>12</td>
<td>Surge Protection for Twisted-Pair Communications</td>
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<td>13</td>
<td>Flasher Load Switch Model 204</td>
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<td>14</td>
<td>Cabinet Power Supply Model 206L</td>
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<td>15</td>
<td>Power Strip</td>
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<td>16</td>
<td>#2 Lock and Key Set</td>
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<td>17</td>
<td>Aluminum Extender Base for Cabinet Assembly</td>
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<td>18</td>
<td>Low Voltage Protection</td>
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<tr>
<td>19</td>
<td>2070-7A Card</td>
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<td>20</td>
<td>Conflict Monitor Tester ATSI Model 8000</td>
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<td>21</td>
<td>Suitcase Tester for 170 and 2070 controllers</td>
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<td>22</td>
<td>Cabinet Assembly Display Unit</td>
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<tr>
<td>23</td>
<td>Evaluation of Equipment for Repair outside Warranty Period</td>
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<td>140</td>
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<td>24</td>
<td>Repair Equipment outside Warranty Period</td>
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<td>25</td>
<td>SCDOT Signal Cabinet Training</td>
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<td>26</td>
<td>Conflict Monitor Training</td>
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</tbody>
</table>

## EQUIPMENT SPECIFICATIONS

SCDOT’s current equipment specifications are included. All equipment supplied under this contract shall meet or exceed these specifications. Include with your proposal detailed information on all products to be supplied. Identify any areas where products fail to meet these specifications as well as any features that exceed SCDOT’s current specifications.

The following specifications state the minimum acceptable requirements, materials, and workmanship for traffic signal control equipment to be supplied to SCDOT. These are SCDOT specific requirements that extend or modify the California Department of Transportation (CALTRANS) Specification.

Further, equipment shall conform to the applicable requirements of Underwriter's Laboratory Incorporated (UL); the Electronic Industries Association (EIA); the National Electric Code (NEC); the American Society for Testing and Materials (ASTM); the American National Standards Institute (ANSI); and other applicable standards and specifications.

Described below:

- **EQUIPMENT DETAILS**
- **DELIVERY**
- **WARRANTIES AND SERVICE**
- **DOCUMENTATION**
- **EQUIPMENT DETAILS**
Item 1  **Controller** Model 2070 Controller

This item consists of furnishing Model 2070 Standard, single port, non-switch, RJ45, Ethernet controller. The controller shall also be digital, solid-state, micro-processor based, keyboard (push-button) programmable, and in accordance with the Network Services Security Policy for Network Attached Devices included in this solicitation. Units shall conform to CALTRANS Transportation Electrical Equipment Specifications (TEES), dated July 21, 2008 except as required herein. Provide model 2070 Controllers composed of the unit chassis and at a minimum, the following modules, assemblies, and software:

- Model 2070-4B Power Supply Module, 3Amp
- Model 2070-3B Front Panel Module
- Model 2070 1B CPU Module, single board
- Model 2070-2A Field I/O Module
- Model 2070-7A Asynchronous Serial Com Module (price as an optional or add on item)
- Controller must be able to accept and operate fully with Apogee firmware version 65 and 76 and shall be able to communicate with central ATMS.NOW software.

Item 2  **Cabinet Assembly (larger)** Model 332A

A complete operating Cabinet Assembly containing the standard CALTRANS equipment complement with/including: one (1) Conflict Monitor, twelve (12) Load Switches, two (2) DC Isolators, Fourteen (14) Flash Programming Sockets, Seven (7) Flash Transfer Relays, and eight (8) LCD Enhanced Loop Detectors. The 332A Cabinet Assembly shall NOT include a 2070 Controller. The Model 332A Cabinet Assembly (66" x 24" x 30") shall be as specified in the CALTRANS Specifications. This Cabinet shall incorporate an INPUT TERMINATION PANEL. The Cabinet shall be base mounted. 332A Cabinet Assembly shall be configured for eight (8) vehicle phases, four (4) pedestrian phases and shall include an AUXILIARY MODEL 420 OUTPUT FILE, for six (6) overlap phases. The Auxiliary Output File shall house three (3) Flash Transfer Relays and six (6) Flash Programming Sockets. The Auxiliary Output File shall be wired to ensure that all six (6) phases flash correctly during flashing operation where 18 channels are being used, no dark signals shall be allowed during the flashing operation. See additional requirements for all cabinet assemblies following this detail.

Item 3  **Cabinet Assembly (smaller)** Model 336S

A complete operating Cabinet Assembly containing the standard CALTRANS equipment complement with/including: one (1) Conflict Monitor, eight (8) Load Switches, two (2) DC Isolators, eight (8) of Flash Programming Sockets, four (4) Flash Transfer Relays, and six (6) LCD Enhanced Loop Detector. The 336S Cabinet Assembly shall NOT include a 2070E Controller. The Model 336S Cabinet Assembly (46" x 24" x 22") shall be as specified in the CALTRANS Specifications. The Cabinet shall be capable of side-pole mounting, as well as base mounting. See additional requirements for all cabinet assemblies following this detail.

The 336S Cabinet shall NOT have an AUXILIARY OUTPUT FILE. Additionally, Auxiliary Output files will not be added to a 336S Cabinet Assembly, therefore the additional wiring necessary to add an Auxiliary Output file shall not be installed. All assemblies in the 336S Cabinets shall be installed in the upper most position so that free space at the bottom of the cabinet is maximized. See additional requirements for all cabinet assemblies following this detail.

Items 2, 3  **Cabinet Assemblies**

The equipment to be furnished shall be in accordance with CALTRANS Transportation Electrical Specifications.
Equipment Specifications (TEES), dated July 21, 2008 except as required herein. Further, the equipment shall meet the special SCDOT requirements, as stated in the following Specifications. In case of conflict, SCDOT Specifications shall govern. In addition to meeting the CALTRANS specifications, Item 2 and Item 3 shall also meet the following:

**Cabinet structure details**

- Front and back door switches shall be fully insulated against water intrusion and located on the bottom door hinge.
- Railroad inputs shall be easily accessible for input installations.
- A Fellowes 99111, or equivalent, power strip shall be installed along the wall on the high voltage side of the cabinet and plugged into a non-GFI switch on the back of the cabinet power supply.
- Nylon card-guides shall be integrated into the cabinet assemblies where all Load Switch, Flasher, Input File and Power Supply Hardware may be installed. The card guide slots shall be of sufficient depth to support pluggable devices when they are not fully inserted into the electrical receptacles, and the installation or removal of pluggable devices shall not require excessive force.
- AC Service terminal blocks shall be a minimum of 6" from base of the rack-supports.
- To prevent accidental, electrical contact between the Cabinet Assembly and Conflict Monitor Unit, the entire side panel within the output file that is directly adjacent to the solder-side of the Conflict Monitor Unit shall be insulated with non-conductive sheeting, including covering screw heads, rivets, etc. This sheeting shall not degrade over time and shall remain attached to the output file throughout the life of the Cabinet Assembly. This sheeting shall be of minimal thickness as to not impede the insertion and/or removal of the Conflict Monitor Unit.
- Four (4) support braces (two (2) installed on each side) for the rack assembly shall be welded, with a continuous seam, directly under the rack assembly uprights.
- A Nylon Sleeved cable shall be hard wired directly to the cabinet on one end, and have a plug adapter for the conflict monitor on the other end for monitoring the absence of red. The pin assignments of the Nylon Sleeved cable shall be provided with the Cabinet plans. The Nylon Sleeved cable connection for the conflict monitor shall be physically “keyed” to prevent the cable from being plugged in incorrectly. The Nylon Sleeved cable shall be latched to the conflict monitor. The Nylon Sleeved cable shall be attached to the cabinet so it has to be unplugged before the Conflict Monitor can be removed.
- The 206L Power supply in all Cabinet Assemblies shall be provided with a device that would prevent the power supply from being removed unintentionally. This device must be strong enough to support the weight of the power supply and shall be accessible from the FRONT of the Cabinet Assembly. The insertion or removal of the 206L Power Supply and security device shall not require the use of any tool. The shipping wing nut must be removed.

**Internal Cabinet Requirements**

- Furnish two (2) sets of non-fading cabinet diagrams and schematics that are to be placed in a clear, sealable, water tight, plastic bag and stored within the front-door-mounted laptop shelf/storage compartment. See “Laptop Shelf” requirements later in this specification.
- Furnish two (2) Model 242 DC Isolators with all 332A and 336S Cabinet assemblies. These items are to be installed within the cabinet input file, in the pedestrian input slots.
- Furnish eight (8) Enhanced LCD Loop Detectors with all 332A Cabinet Assemblies. These are to be installed in the first eight (8) slots of the upper input file assembly. See LCD Detector requirements later in this specification.
- Furnish six (6) Enhanced LCD Loop Detectors with all 336S Cabinet Assemblies. These are to be installed in the first four (4) slots of the input file assembly. See LCD Detector requirements later in this specification.
- Furnish twelve (12) PDC 200 (SSS-87IO), or equivalent, Load Switches with all 332A Cabinet Assemblies. These are to be installed in the following output file channels: 1, 2, 4, 5, 6, 8, 13, 14, 15, 16, 17, and 18. See for Load Switch requirements later in this specification. All load switch locations in the Output file and Auxiliary output file shall be clearly labeled with permanent screening, with the default CALTRANS phase assignment, in all 332A Cabinet Assemblies.
- All terminations to output files shall be soldered to the back side of the panels.
• Furnish eight (8) PDC Model 200(SSS-8710), or equivalent Load Switches with all 336S Cabinet Assemblies. These are to be installed in the following output file channels: 2, 4, 6, 8, 13, 14, 15, and 16. See Load Switch requirements later in this specification. All load switch locations in the Output file shall be clearly labeled with permanent screening, with the default CALTRANS phase assignment, in all 336S Cabinet Assemblies.

• Furnish two (2) Model 204 Flasher Load Switches with all 332A and 336S Cabinet Assemblies. These are to be installed in the flasher slots within the Power Distribution Assembly (PDA). See Flasher requirements later in this specification.

• Load Switches and Flashers are to be secured within their respective slots for shipment, with 1/2” string-reinforced tape as a minimum.

• Furnish a Thermostat-controlled, dual-fan (100CFM minimum rating per fan) ventilation system in all 332 series Cabinet Assemblies.

• Furnish a Thermostat-controlled, single-fan (100CFM minimum rating) ventilation system in all 336S Cabinet Assemblies.

• 332A and 336S Cabinet Assemblies shall NOT utilize a Mercury Contactor switch. A field-proven solid-state device or equivalent shall be used.

• The Flash Sense/Stop Time terminations in the Input File Assembly shall be wired such that a DC Isolator will not be required for implementation of these functions by the Conflict Monitor Unit.

**Power Supply**

• The Power Supply furnished in all 332A and 336S Cabinet Assemblies shall be the EDI 206L Switching Power Supply, or equivalent.

**Conflict Monitor**

• The Conflict Monitor shall be an EDI Model 2018 ECL-IP Conflict Monitor with absence of red monitoring.

• The Conflict Monitor Unit shall contain a 10/100 Ethernet port on the front panel for the uploading of alarms and/or event logs with a standard laptop computer. This port shall also allow for future communication within an Ethernet-based infrastructure.

• The Nylon Sleeved cable shall be routed internally or between the rack assembly and cabinet wall. The cable shall be anchored to the front of the output file so that the Conflict Monitor Unit cannot be removed with the cable attached.

**Thermostat**

• Cabinet Thermostat to be factory-set to 90 degrees in all Cabinet Assemblies.

• Cabinet Thermostat and thermostat temperature setting shall be easily accessible and adjustable from the front of all 332A Cabinet Assemblies.

• Cabinet Thermostat and thermostat temperature settings shall be easily accessible and adjustable from the rear of all 336S cabinet assemblies.

• Cabinet Thermostat terminals shall be insulated to prevent accidental electric shock.

**Pedestrian Button and Loop Detection Inputs**

• All Vehicle and Pedestrian terminals on the Loop Input Termination Panel shall be clearly labeled with permanent screening, with the default CALTRANS phase assignment, in all 332A and 336S Cabinet Assemblies.

• "Ped-Yellows" shall be provided with "dummy loads" consisting of load resistors rated at 5 Watts minimum. The impedance of the load resistors shall be such that the Conflict Monitor Unit does NOT see a false indication for the yellow output of the pedestrian channels.

• The 332A Cabinet Assembly shall include additional terminations for Pedestrian Pushbutton inputs. A Minimum of twenty-four (24) extra terminals (12-position, dual-bus terminal strip) shall be provided, allowing sixteen (16) additional termination points for four (4) Pedestrian Phases. The remaining eight (8) termination points shall be for the shared or “common” input for the adjacent Pedestrian Phase terminations. These are to be wired in parallel with the standard input file terminations and surge protection. This termination panel shall be easily accessible, clearly labeled with permanent screening and may be placed in any available space on the side panel containing the
standard Loop and Pedestrian input terminations. The required configuration is shown here:

The 332A and 336S Cabinet Assemblies shall have a ‘Detector Test Panel’ installed above the Controller Unit. The panel shall be installed within the rack assembly and will have eight (8) 3-position mini-toggle switches, symmetrically spaced and horizontally arranged for placing calls to the Controller Unit. 3-position On-Off-On switches shall activate inputs. Upward motion of the switch shall lock into place and shall place a vehicle call to the Controller Unit until the switch is manually returned to center position. The center position of the switch shall not inhibit normal detector operation. Downward motion of the switch shall place a momentary closure vehicle call and will allow the intersection to resume normal detector operation when released. This panel shall be clearly labeled with permanent screening beneath each switch. The labeling shall identify each detector switch and default phase assignment for phases 1 through 8. The panel should also be titled “Vehicle Call Panel” and shall include a legend for switch operation: “On, Auto, Pulse”. The panel shall be wired as follows:

<table>
<thead>
<tr>
<th>336S Cabinet</th>
<th>332A cabinet</th>
</tr>
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<tbody>
<tr>
<td>Detector Switches</td>
<td>Terminal</td>
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<tr>
<td>Phase 1</td>
<td>I1-F</td>
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<tr>
<td>Phase 2</td>
<td>I2-F</td>
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<tr>
<td>Phase 3</td>
<td>I3-F</td>
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<td>I4-F</td>
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<td>Phase 5</td>
<td>I5-F</td>
</tr>
<tr>
<td>Phase 6</td>
<td>I6-F</td>
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<td>Phase 7</td>
<td>I7-F</td>
</tr>
<tr>
<td>Phase 8</td>
<td>I8-F</td>
</tr>
</tbody>
</table>

Key Sets and Doors
- Front and rear doors of all cabinet assemblies shall implement a #2 Corbin Locking assembly. Two (2) BRASS keys are to be included with each Cabinet Assembly.
- The front and rear door locks for all Cabinet Assemblies shall have a minimum of 1 mm (0.03937”) clearance between the edge of each side of the lock bolt and the cabinet’s latch cam assembly.
- Both doors shall be ventilated and are to include disposable filters that are secured in place, yet easily removed or re-installed for replacement.
- Front and rear door handles for all cabinet assemblies shall turn away from the door lock/key to open the cabinet door.

Cable
- Appropriate Red, Yellow or Green color-coding shall be used for all Load Switch input and Load Switch output wiring within the Output and Auxiliary Output Files.
• Applicable 170-style cabling shall be included in all 332A and 336 S Cabinet Assemblies.

Police Panel/Button
• Police panel door shall be insulated to prevent water from entering the cabinet assembly. The insulation material used and its ability to resist water-penetration shall not degrade over time.
• The Police panel assembly shall have a drain to prevent water from collecting within the assembly. Per CALTRANS, the drain shall be channeled to the outside of the cabinet. There shall be no additional holes within the police panel.
• The protective cover for the police panel key opening shall be snug with the police panel door and shall not move freely. However, this protective cover shall be easily opened without having to use any tool.
• Manual Control cord shall be permanently hard-wired into the Police panel assembly to prevent removal.
• Manual Cord shall be anchored to the inside of the cabinet chassis to prevent over-extension and/or damage to the Police Panel terminations when the cord is extended for use.
• For storage, the Manual Control cord should be fed into the cabinet assembly through a grommet opening at the top of the police panel. The location of the opening shall not allow water to enter the cabinet. Additionally, the cord shall be fed for storage into an area where there is no risk of ‘snagging’ the cable when it is extended for use. The storage area shall be sealed completely to prevent water from entering the cabinet when the police panel door is open.
• For additional security, a quick-connect/quick-disconnect, molex-style connector shall be used for the Police Panel wiring inside the Cabinet Assembly. This connector shall NOT be accessible from the Police Panel and should be easily accessible from inside the cabinet. The wiring of this connector shall be such that, when disconnected, the Manual Control Enable/Advance Enable function on the Police Panel, as well as the Interval Advance/Advance function on the manual cord cannot be applied to the Controller Unit.
• The Police panel shall be wired such that the Interval Advance/Advance function cannot be applied to the Controller Unit when the Manual/Auto switch is in the Auto position.
• Each 332A and 336S Cabinet Assembly shall be provided with a manual police push button on an insulated cord allowing the operator to stand a minimum of 6’ from the Cabinet Assembly, permanently mounted in conjunction with a manual/auto switch. When placed in the manual position, Manual Control Enable or Advance Enable shall be applied to the Controller, and Minimum Recall shall be applied to all used phases. Activation of the push button shall apply the Interval Advance or Advance input to the Controller Unit. Manual advancement will be prohibited in the minimum green, and clearance timing intervals.

Laptop Shelf
• For all 332, 332A and 336S Cabinet Assemblies, a hinged, aluminum shelf and integrated storage compartment shall be installed on the front door, inside the Cabinet Assembly. The hinge, shelf, or shelf parts shall not come off or interfere with closing the shelf or the cabinet door.
• To allow better ventilation throughout the cabinet and rack, a sliding shelf/drawer within the rack assembly will not be permitted.
• The shelf shall have a smooth, non-slip surface, sufficient for use as a writing platform and of sufficient size and rigidity to support any laptop computer when extended for use.
• This shelf shall have rounded or insulated edges that do not have the potential to physically harm the user.
• The shelf shall lock into place when folded for storage.
• Locking the shelf for storage and/or extending for use shall not require the use of any tool.

Cabinet Lighting
• Each Cabinet shall include two (2) LED lighting fixtures with the switch built-in.
• One mounted inside the top-front portion of the Cabinet and one mounted inside the top-rear portion of the cabinet.
• Both shall illuminate equivocally to a 15-watt, cool white fluorescent light fixture and shall include an easily accessible on-off switch.
• Door-actuated switches shall be installed to turn on the cabinet lights when either the front or rear door are opened.

Mounting
• Each 336S Cabinet shall be supplied with a removable base plate. Two (2) pole mounting brackets shall be attached to each 336S cabinet.
• Install an aluminum plate for reinforcement of the pole-mounting brackets. This plate shall be installed inside the 336S Cabinet Assembly and shall utilize threaded Penn Engineering & Manufacturing Corporation (PEM) nuts or self-clinching fasteners for simple installation and removal of exterior pole-mount bracket bolts without the use of any tool, inside the Cabinet Assembly.
• For 336S and 332A Cabinet Assemblies, the base mounting anchor-bolt pattern shall be as specified in the CALTRANS Specifications.

Surge Protection
• Cabinet assemblies shall include the Emerson (Edco) SHA-1250 Surge Protection device or equivalent, and shall be a plug-in type installation, or shall be integrated onto a plug-in style panel for simple replacement. This assembly should be easily accessible within the Cabinet Assembly shall be mounted a minimum of 6” from base of the rack-supports and secured to prevent unintended removal.
• Removal/replacement of the surge suppressor or manufacturer-designed panel assembly shall not require the connection or disconnection of any wiring within the cabinet and shall be a simple procedure for one (1) technician.
• Each 336S and 332A Cabinet shall be provided with devices to protect the control equipment from surges and over voltages. This shall include incoming power lines, the Input File, the Output File (load switch-packs), and communication lines.
• For any existing on-street twisted-pair communication, an Emerson (Edco) PC642 surge protection device and applicable 170-style cabling shall be included in 332A and 336S Cabinet Assemblies.
• The surge protection for the Input File shall be in accordance with the assignment of the slots of a standard 336S Cabinet assembly. Surge protector termination panels shall be provided, attached to the Cabinet rack assembly. AC isolation terminals shall be on the same side of the Cabinet as the AC service inputs. DC terminals and loop detector terminals shall be installed on the opposite side of the Cabinet from the AC power lines, to reduce electromagnetic induction. The surge protector panels shall be designed to allow for adequate space for a wire connection and surge protector replacement. Surge protection shall be provided for the full capacity of the Cabinet Input File.
• It is the intent of SCDOT to require surge protection on each CALTRANS defined input; that is, full protection. For example, on the 336S Cabinet, Vehicle Loop Detector Surge Protection would be required on two (2) channels each, of Slots 1 to 8 of the Input File. In addition, on the remaining Slots 9 to 14, Pedestrian surge protection; plus Auxiliary (pre-emption) protection as defined.
• On the 332A Cabinet, full protection is desired on both Input Files. For example, Vehicle Loop Detector Surge Protection would be required on two (2) channels each, of Slots 1 to 8 of BOTH INPUT FILES I AND J; together with pedestrian and auxiliary protection on both racks.
• For the 332A Cabinet, appropriate input surge protection shall be mounted on the INPUT TERMINATION PANEL. For the 336S Cabinet, appropriate input surge protection shall be mounted on a FOLD-DOWN TERMINATION PANEL on the rear of the cabinet assembly. This fold-down panel shall not obstruct the Output File Field wiring when in the closed position and shall utilize thumb-screws to secure the panel under normal operating conditions. The fold-down portion of this panel shall be easily accessible and shall be mounted to the rack assembly.
• Under no circumstance (normal operation or short-circuit condition) shall the ampacity of the internal wiring and printed circuit board traces be less than the protecting threshold of circuit breakers and surge protectors provided.

Power Distribution Assembly
• The Power Distribution Assembly of each Controller Cabinet shall include a surge protective device (SPD) on the AC Service Input. It shall be capable of reducing the effect of lightning transient voltages applied to the AC line. The protector shall be a two-stage series/parallel device, and shall be an Emerson (Edco) SHA-1250 or equivalent. The SPD shall meet or exceed the following...
MATERIAL SPECIFICATIONS  REVISED 5/16/2016

requirements:
- Maximum AC line voltage: 140 VAC
- Twenty pulses of peak current, each of which will rise in 8 μs and fall in 20 μs to one-half the peak: 20,000 A

The protector shall be provided with the following terminals:
- Main line (AC Line first stage terminal)
- Main Neutral (AC Neutral input terminals)
- Equipment Line Out (AC Line second stage output terminal, 10 A).
- Equipment Neutral Out (Neutral terminal to protected equipment).
- Ground (Earth connection)

The Main AC line in and the Equipment Line out terminals shall be separated by a 200 Micro Henry (minimum) inductor rated to handle 10 A AC Service.

The first stage clamp shall be between Main Line and Ground terminals.

The second stage clamp shall be between Equipment Line Out and Equipment Neutral.

The protector for the first and second stage clamp shall have a Metal Oxide Varistor (MOV) or similar solid-state device rated at 20 KA; and be of a completely solid stage design (i.e. no gas discharge tubes allowed).

The Main Neutral and Equipment Neutral Output shall be connected together internally, and shall have an MOV (or similar solid state device, or gas discharge tubes) rated at 20 KA between Main Neutral and Ground terminals.

Peak clamp voltage: 250 V at 20 KA. (Voltage measured between Equipment Line Out and Equipment Neutral Out terminals. Current applied between Main Line and Ground Terminals with Ground and Main Neutral terminals externally tied together).

Output voltage shall never exceed 280 volts.

The Protector shall be epoxy-encapsulated in a flame retardant material.

Continuous service current; 10 A at 120 VAC RMS.

The Equipment Line Out shall provide power to the Controller, and to the 24 V power supply.

Inductive Loop Detector Inputs
Each inductive loop detector input channel shall be protected by an external, surge protective device which shall be an Emerson (Edco) SRA-6LC-6 or equivalent. The SPD shall meet or exceed the following requirements:
- It shall be a three-terminal device, two of which shall be connected across the signal inputs of the detector. The third terminal shall be connected to chassis ground to protect against common mode damage.
- It shall instantly clamp differential mode surges (induced voltage across the loop detector input terminals) via a semiconductor array. The array shall be designed to appear as a very low capacitance to the detector.
- It shall clamp common mode surges (induced voltage between the loop leads and ground) via solid state clamping devices.
- It shall meet or exceed the following requirements:
  - Peak Surge Current: 250A
  - Differential Mode: 400 A (8x20 μs)
  - Common Mode: 1000 A (8x20 μs)
  - Estimated Occurrences: 500 @ 200 A
  - Response Time: 40 ns
  - Input Capacitance: 35 pf typical
  - Temperature: -40 degrees to +85 °C
  - Mounting: No. 10-32 x 3/8" bolt
  - Clamp Voltage: 130VDC
    - @400 A Differential Mode 30 V maximum
    - @1000 A Communication Mode 30 V maximum
Signal Load Switches (Switch-Packs)

- The outputs of each switch-pack in the output file shall be provided with a surge protective device comprised of metal oxide varistors (MOVs) which shall be a V150LA20A or equivalent. The SPD shall meet or exceed the following requirements:

**Communication Inputs**

- Each low voltage communication input shall be protected as it enters the cabinet with a modular type surge protective device comprised of three-stage hybrid technology protection consisting of gas discharge tubes (GDT), silicon avalanche diodes (SAD) and positive temperature coefficients (PTC), which shall be and Emerson (Edco) PC642C Series or equivalent. The SPD shall meet or exceed the following requirements:
  - US 497B Listed
  - Operating current: 0.15A
  - Peak surge current: 10kA
  - Frequency range: 0 to 20MHz
  - Insertion loss: <0.1 dB at 20 MHz

**Low Voltage DC Inputs**

- Each DC Input channel shall be protected by an external, surge protective device which shall be an Emerson (Edco) SRA64-030N or equivalent. The SPD shall meet or exceed the following requirements:
  - It shall be a five terminal device. Two terminals shall be connected to the line side of the low voltage pair, two terminals shall be connected to the Input File side, and the fifth terminal shall be connected to chassis ground.
  - It shall meet the following minimum requirements:
    - Peak Surge Current: 2000 A 8x20 µs Wave-shape
    - Occurrences at Peak Current: 100 typical
    - Response Time: 5 to 30 nanoseconds
    - Shock: Withstands 10-foot drop on concrete
    - Voltage Clamp: 30 V
    - Series Resistance: 5 Ohms typical
    - Temperature: -40 Degrees to +85 °C

**Pre-Emption, Interconnect & 115 VAC Signaling Inputs**

Each pre-emption, interconnect, or AC signaling input channel shall be protected by an external surge protective device, which shall be an Emerson (Edco) PC642 Series or equivalent. The Emerson (Edco) PC642 shall use a PCB 1B base for quick changeability.

Items 4-22 are individual replacement parts or optional items. These items must meet the specifications of the equipment to be included in the cabinet or otherwise described. There is no guarantee on the quantity of these items.

**Item 4** Conflict Monitor Model 2018 ECL-ip

The Conflict Monitor shall be an EDI Model 2018 ECL-IP Conflict Monitor with absence of red monitoring. The Conflict Monitor Unit shall contain a 10/100 Ethernet port on the front panel for the uploading of alarms and/or event logs with a standard laptop computer. This port shall also allow for future communication within an Ethernet based infrastructure.

**Item 5** Conflict Monitor Model 2010 ECL-ip

This is an option for replacement parts only, not to be furnished with the 332A and 336S Cabinet Assemblies for this contract. The Conflict Monitor shall be an EDI Model 2010 ECL-IP Conflict Monitor with absence of red monitoring. The Conflict Monitor Unit shall contain a 10/100 Ethernet port on the
front panel for the uploading of alarms and/or event logs with a standard laptop computer. This port shall also allow for future communication within an Ethernet based infrastructure.

**Item 6  Red Enable Board**
This is an option for replacement parts only, not to be furnished with the 332A and 336S Cabinet Assemblies for this contract. Red enable board shall implement individual, 2-position Rocker style DIP switches allowing any unused red channel to be tied to AC+. The Red Enable board shall be easily removable and replaceable from the outside of the Output File Assembly. Removal and replacement shall not require the Output File Assembly to be opened. The design shall be such that the board can be easily un-plugged and replaced. During normal operation the board shall be secured to the Output File Assembly.

**Item 7  Load Switch Model 200**
The Load Switch shall be a PDC MODEL SSS-87PI/O LOAD SWITCH, meeting or exceeding the CALTRANS Specifications.

**Item 8  DC Isolator EDI Model 242**
The D. C. Isolator unit shall be an EDI MODEL 242 or equivalent as specified in the CALTRANS Specifications.

**Item 9  Flash Transfer Relay Model 430**
The Flash Transfer Relay unit shall be a MODEL 430 as specified in the CALTRANS Specifications.

**Item 10  Loop Detector Rack Mount, LCD Enhanced/Intelligent**
The Loop Detector Amplifier Unit shall be an EDI Oracle or Reno A&E Model C Rack Mount Detector Amplifier or equivalent. The Detector shall perform properly when installed in new or existing Cabinet Assemblies in South Carolina.

**Item 11  Loop Detector Amplifier Model 222**
This is an option for replacement parts only, not to be furnished with the 332A and 336S Cabinet Assemblies for this contract. The Loop Detector Amplifier Unit shall be an EDI MODEL 222, or equivalent, as specified in the CALTRANS Specifications. The detector shall be two (2) channels and shall perform properly when installed in new or existing Cabinet Assemblies in South Carolina.

**Item 12  Surge Protection for Twisted-Pair Communications**
Surge protection for twisted-pair communication shall be included at SCDOT request when ordering. This device is not standard for all cabinets. The surge protection device shall be an Emerson (Edco) PC642C Series, or equivalent. This shall utilize the PCB1B base.

**Item 13  Flasher Load Switch Model 204**
The flasher module shall be a PDC MODEL SSF-87P FLASHER, meeting or exceeding the CALTRANS.

**Item 14  Cabinet Power Supply Model 206L**
The Cabinet Power Supply shall be the EDI Model 206L Power Supply or equivalent. The Power Supply Unit shall incorporate switching design technologies as well as Power Factor Correction.

**Item 15  Power Strip**
The Power Strip shall be a Fellowes 99111 or equivalent.
Item 16  #2 Lock and Key Set
The #2 Lock and Key Set shall meet the specifications of this contract.

Item 17  Aluminum Extender Base for Cabinet
This item shall be ordered as SCDOT option. For cabinets, an 8” to 12”, aluminum extender base shall be available, manufactured in the shape and dimensions that match the shape, dimensions and bolt-pattern of a Cabinet Assembly. The appropriate stainless steel hardware (nuts, bolts and washers) shall be included with each extender base to sufficiently mount the base to the Cabinet Assembly.

Item 18  Low Voltage Protection
- Each low voltage communication input shall be protected as it enters the cabinet with a surge protection unit which shall be an Emerson (Edco) PC-642C-30-X, or equivalent, that meets or exceeds the following requirements:
  - It shall be a dual pair (four wire) module with a printed circuit board connector, double-sided and gold-plated for reliability.
  - It shall mate and be installed in a ten (10) circuit Buchanan connector PN PCB1B-10A or equivalent.
  - It shall be utilized as two independent signal pairs. The data circuits shall pass through the protection in a serial fashion. It shall be a hybrid two-stage unit.
  - It shall meet the following minimum requirements:
    | Parameter               | Requirement                             |
    |-------------------------|-----------------------------------------|
    | Peak Surge Current      | 10 KA(8x20 μs, wave shape)             |
    | Occurrences at 2000 A   | >100                                    |
    | Response Time           | <1 nanosecond                           |
    | Voltage Clamp           | 30                                      |
    | Series Resistance       | ≥ 15 Ohms per line                      |
    | Temperature             | -40 degrees to +85 degrees C            |
    | Primary Protector       | Three element gas tube 10KA, 8x20 μs per side |
    | Secondary Protector     | Rugged solid state clamps, 1.5 KW minimum |
- The line side shall be connected to the Communication field wires.
- The load side shall be connected to the C2 connector of the 170 Controller or the 2070-6B Communication Module of the 2070 Controller.
- The ground terminal shall be connected to chassis ground.

Item 19  2070-7A Card
This is an optional item.

Item 20  Conflict Monitor Tester
The Conflict Monitor Tester shall be the ATSI Model 8000. This shall be a stand-alone portable “Tester”, intended for use on a workbench.

Item 21  Suitcase Tester for 2070 controllers
This is an optional item.

Item 22  Cabinet Assembly Display Unit
The unit required for this contract will be used by signal shop technicians during the set up and integration of 336S and 332A Cabinet Assemblies. Via permanent screening, the unit will display a
mock-up of a quad intersection with left turns, to include flashing yellow arrow indications for the left turn phases, and shall implement appropriately arranged and colored AC-driven indications of all channels for eight (8) vehicle phases and four (4) pedestrian phases. The unit shall also have additional indications for six (6) auxiliary vehicle overlaps and four (4) pedestrian yellow channels. The display unit shall include a harness that is a minimum of 10’ in length, Termination wires shall be red, yellow, and green color-coded and phase marked for all indications, as well as one (1) white, AC Neutral and one (1) green, Chassis Ground termination. All wires shall have #10 stud spade lugs installed and shall be labeled by phase and color.

The display unit shall provide proper load to accurately simulate on-street, AC signal terminations for testing purposes within a signal shop environment. This unit shall be designed so that it can be placed on top of the Cabinet Assembly, or hung on the inside of the front door of any Cabinet Assembly supplied for this contract.

**Item 23  Evaluation of Equipment for Repair outside Warranty Period (Unit is EACH)**

SCDOT shall submit equipment to the vendor for evaluation to determine cost to repair. Cost for repair shall be provided to the requestor within seven (7) days of submission.

**Item 24  Repair Equipment outside Warranty Period (Unit is HOURS)**

SCDOT shall have the option to have equipment repaired based on cost determined through evaluation. Repair shall be completed within thirty (30) days of submission.

**Item 25  SCDOT Signal Cabinet Training (Unit is EACH)**

SCDOT requires the option of a four (4)-day, formal, "hands-on" classroom-training for traffic signal cabinet assemblies.

The training shall provide a personal "take-home" package of training materials/documentation for each student, as well as a pdf of training materials for SCDOT Headquarters Signals group. Training shall be provided for up to fifteen (15) participants.

The Vendor representing the procurement of Items 1 and 2, Complete Cabinet Assemblies, shall provide training in the design, operation, and maintenance of cabinets and associated equipment; and of cabinet set-up and configuration. The Vendor shall provide all necessary equipment for appropriate demonstration of training. The trainer shall be prepared to present a minimum of eighteen (18) hours of classroom and "hands-on" training.

The Vendor of other, individual items included in this contract shall be prepared to present six (6) hours of classroom and hands-on training for individual bid Items each year. This includes providing appropriate equipment for demonstration and contracting with other vendors as necessary. Details of this training shall be coordinated with SCDOT, and with other Vendors, including subject and materials required.

Sample Training Agenda to include: (Actual training agenda to be at the discretion of SCDOT.)

Day 1: A maximum of fifteen (15) people, would receive "engineering related training", including: Introduction, Equipment description, Operation, and engineer controlled cabinet setup.

Day 2, Day 3: A maximum of fifteen (15) persons would receive "hands-on" training on maintenance and repair of all user serviceable equipment. Maintenance training shall include field level troubleshooting. This training shall be for a minimum duration of two (2) days.

Day 4: The group of fifteen (15) as above shall receive Training on Individual cabinet Items. The subjects shall be coordinated between Vendors, to avoid duplication.

Training classes shall be prepared to start within two (2) months of the receipt of the first shipment of equipment by SCDOT (unless otherwise directed).

**Item 26  Conflict Monitor Training (Unit is EACH)**

SCDOT requires the option of a one (1)-day training for conflict monitors and testing.
Vendor shall provide training to include Conflict Monitor Testing and programming, including special functions and flashing yellow arrow programming in accordance to SCDOT design guidelines. Vendor shall provide curriculum, three (3) bound copies and a pdf, to SCDOT prior to training. Training shall be provided for up to fifteen (15) participants.

DELIVERY

Direction concerning delivery is for Items 1-22 is listed below:

- **Time**
  - The vendor to be prepared to provide these items immediately after award. The maximum delivery time permitted will be SIXTY (60) DAYS from the date of the Purchase Order.

- **Packaging**
  - Equipment shall be appropriately boxed or crated for shipment, to prevent physical damage. The Vendor shall make shipments using the minimum number of containers consistent with the requirements of safe transit, available mode of transportation, and routing. The boxes or crates shall be sealed in 3 mil thick polyethylene plastic sheeting for outdoor storage. Complete Cabinet Assemblies shall be shipped as one unit. Items of equipment packed inside the Cabinet shall be protected and secured for shipment.

- **Pallets**
  - Cabinet(s) shall be bolted to shipping pallets.

- **Labeling**
  - Each cabinet/box shall be clearly labeled, IN PLAIN ENGLISH as to the contents; for example: "Type 332A Cabinet". All packages shall be identified with the Local Vendor Name, Manufacturer Name, SCDOT Purchase Order Number and Shipment Date. Packing lists and EQUIPMENT LABELS shall be glued to every carton showing its contents. A Certificate Of Compliance shall be attached to the packing list of each shipment.

- **Schedule**
  - The deliveries for Items 1-22 shall be made to the Supply Depot (1418 Shop Road, Columbia, SC 29201-4844) in Columbia or to the District Signal Shops if requested by SCDOT. When purchased as part of a System the delivery shall be made to a District/location near the Site of work if it is deemed necessary.

<table>
<thead>
<tr>
<th>SCDOT District 1 Signal Shop</th>
<th>SCDOT District 3 Signal Shop</th>
<th>SCDOT District 5 Signal Shop</th>
<th>SCDOT District 7 Signal Shop</th>
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<td>803-241-1117</td>
<td>803-661-4812</td>
<td>803-395-7188</td>
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<tr>
<td>1408 Shop Rd</td>
<td>13 Saluda Dam Rd</td>
<td>3018 East Palmetto St</td>
<td>1768 Charleston Highway</td>
</tr>
<tr>
<td>Columbia, SC 29201-4844</td>
<td>Greenville, SC 29611-3818</td>
<td>Florence, SC 29506-</td>
<td>Orangeburg, SC 29115-7722</td>
</tr>
</tbody>
</table>

- **Special Orders**
  - The Vendor shall follow the shipping instructions as stated on the Purchase Order or attachments.

WARRANTIES, REPAIRS AND SERVICE

- **Service** - The vendor/manufacturer shall provide services adequate for the operation, repair, and replacement for each item. Adequate service will apply to reasonable response provided by technical personnel experienced with each item.

- **Repair Parts** – The Vendor shall be able to ship to the Department within three (3) business days, any component parts required to maintain this equipment.

- **Maintenance and Repair Services** – Complete data on maintenance and repair services shall be available, for the convenience of the Department, in the post-warranty period as listed below.

- **This maintenance data shall include** location of the service facility, services offered, turn-around...
time, and estimated repair costs.

- **Warranty Period**
  - The Vendor shall fully guarantee all items, services, equipment and materials provided under this contract. If the equipment Vendor is other than the Manufacturer, then the Vendor shall be fully responsible for all warranties and requirements of this Specification. The duration of the warranty or guarantee shall be the standard of the industry, with a minimum period of twenty-four (24) months from the date of shipment to the SCDOT. The warranty shall cover all Manufacturer's defects, including parts, labor, and shipping costs. Any item found not in accordance with this Specification will be rejected, and returned to Vendor at the Vendor's expense for immediate replacement. A second occurrence of this infraction will be sufficient reason for total rejection of the contract for that item.

- **Repair**
  - The vendor shall have an office and/or authorized factory representative within 150 miles of Columbia, SC and be able to perform on-site warranty repair or replacement of items purchased from this contract, within two (2) business days after receiving complaint. The authorized factory representative shall have a permanent office located within the state of South Carolina. This office shall have a permanent street address, Air Conditioning and Heat, a permanent indoor restroom, a listed voice number, and computer/internet access with a valid e-mail address. Warranty repairs are to be performed at no additional cost.

- **Extension**
  - Following warranty repair or replacement, the warranty period (for that item or module), shall be extended for an additional period of one (1) year.

- **Required Equipment Submittals:**
  - One each of the exact cabinets, FULLY OPERATIONAL WITH REQUIRED EQUIPMENT, WIRING, LABELING, ETC., the Vendor intends to supply, INCLUDING PACKAGING, (one 336S and one 332A) for inspection before the contract is awarded.

**DOCUMENTATION** – (This Section supersedes the CALTRANS Specification.)

- **Cabinet Assemblies**
  - The Vendor of COMPLETE CABINET ASSEMBLIES shall be responsible for providing with each and every Complete Assembly Cabinet, two (2) complete Cabinet Wiring Diagrams

- **Other Equipment**
  - Documentation is also required for each auxiliary piece of equipment in the Cabinet Assembly. The intent is to require documentation sufficient for operation and maintenance of each item to the satisfaction of SCDOT. All documentation shall be prepared in a clear, concise manner; with appropriate illustrations, tables, and cut-away drawings, and voltage/waveform reference pictures.

- **Binding**
  - The documentation shall be adequately BOUND, for protection and to prevent loss of pages. Binding should consist of two heavy-duty staples, with binding tape; or plastic spiral binding. Fonts and sizes shall be per CALTRANS Specifications.

- **Contents**
  - The vendor shall provide ten (10) sets of documentation material as described below at the request of SCDOT.
  - The documentation material shall include, but not be limited to, the following:
    - General description.
    - Installation procedure.
    - Operating procedure.
    - Theory of operation, voltages, wave forms.
    - Maintenance and troubleshooting procedures.
• Schematic diagrams of circuits and IC boards.
• Pictorial layout of IC board components.
• Parts list including description, reference symbol, part number and location.
1.1 Description

This specification describes requirements for furnishing a Solar Powered Flasher Assembly.

1.2 Materials

1.2.1 24/7 Single Solar 24 Hour Flashing Beacon

1.2.1.1 Overview

This specification is for the Single Beacon Solar 24 Hour Flashing Beacon. Each unit shall consist of a solar engine, LED signal module and signal housing, and mounting hardware. The system shall conform to all provisions of the MUTCD, Chapter 4K, and Flashing Beacons.

1.2.1.2 Mechanical Specifications

The solar engine shall be vented to provide cooling of the battery and electronic system. Venting shall be covered by wire mesh to prevent intrusion of insects. The unit shall have the provision to mount an external device for remote activation. System must have capability to power such device.

1.2.1.3 Solar / Battery System

The solar engine shall have a field replaceable sealed lead acid battery or batteries. Solar panel and battery system shall be 12 Volt DC.

The solar panel or panels shall meet the design qualification and type approval of photovoltaic modules in accordance with IEC 61215. This specification includes radiation testing, thermal testing, and mechanical testing for environmental conditions such as UV-exposure, thermal cycling, as well as degradation of maximum power output.

Battery shall be mechanically secured into the housing.

System shall have an auxiliary 12 VDC power output to power third party devices such as wireless radios or sensing equipment.

1.2.1.4 Signal Housing

The signal housing shall meet the equipment standard of the Institute of Transportation Engineers (ITE) Vehicle Traffic Control Signal Heads (VTCSH) Chapter 2.

1.2.1.5 LED Signal Module


1.2.1.6 Operational Specifications
The system shall conform to all standards for flashing beacons as required in the Manual of Uniform Traffic Control Devices 2003 Edition Revision 1 or current version.

- The beacon shall flash at a rate set by MUTCD.
- The beacon shall have a minimum operating autonomy of 30 days.
- The beacon shall automatically reduce light output in case of low battery situations, reducing risk that the beacons will fail entirely under conditions of poor solar insolation.

1.2.1.7 Activation

The beacon shall operate continuously when the battery is connected. The beacon shall have the option to be turned on by a third party switch or third party device with a compatible contact closure output.

1.2.2 24/7 Single Compact Solar 24 Hour Flashing Beacon

1.2.2.1 Overview

This specification is for the Single Beacon Compact Solar 24 Hour Flashing Beacon.

Each unit shall consist of a self-contained solar engine, LED signal module and signal housing, and mounting hardware such that the entire assembly mounts to the top of the pole. The solar engine shall contain all electronics, batteries & solar panels. No additional cabinet is required. The system shall conform to all provisions of the MUTCD, Chapter 4K, and Flashing Beacons. See Diagrams 1a and 1b.

1.2.2.2 Mechanical Specifications

The Solar panel shall be mounted to the solar engine. All batteries and electronics shall be mounted in the solar engine, with no external control cabinet or battery cabinet required. The solar engine shall be vented to provide cooling of the battery and electronic system. Venting shall be covered by wire mesh to prevent intrusion of insects.

The solar engine shall have the provision to mount an external device for remote activation. System must have capability to power such device. Solar engine must contain sufficient space to house third party device inside a sealed enclosure located inside the solar engine.

The entire system must be delivered as a complete unit ready to install and requiring no assembly.

1.2.2.3 Solar / Battery System

The solar engine shall include a minimum 10-watt solar panel. The solar engine shall house a field replaceable sealed lead acid battery or batteries. Solar panel and battery system shall be 12 Volt DC.
The solar panel shall meet the design qualification and type approval of photovoltaic modules in accordance with IEC 61215. This specification includes radiation testing, thermal testing, and mechanical testing for environmental conditions such as UV-exposure, thermal cycling, as well as degradation of maximum power output.

The solar panel shall consist of a solar panel or panels, mounted to the solar engine.

Battery or batteries shall be mechanically secured into the housing. Battery bracket shall enclose the battery in a manner to restrict the thermal expansion of the battery.

System shall have an auxiliary 12 VDC power output to power third party devices such as wireless radios or sensing equipment.

1.2.2.4 Signal Housing

The signal housing shall meet the equipment standard of the Institute of Transportation Engineers (ITE) Vehicle Traffic Control Signal Heads (VTCSH) Chapter 2.

The signal head shall be mounted below the solar engine.

1.2.2.5 LED Signal Module


1.2.2.6 Operational Specifications

The system shall conform to all standards for flashing beacons as required in the Manual of Uniform Traffic Control Devices 2003 Edition Revision 1 or current version.

- The beacon shall be flash at a rate of set by MUTCD.
- The beacon shall have a night dimming feature.
- The beacon shall have a minimum operating autonomy of 30 days.
- The beacon shall automatically reduce light output in case of low battery situations, reducing risk that the beacons will fail entirely under conditions of poor solar insolation.

1.2.2.7 Activation

The beacon shall operate continuously when the battery is connected. The beacon shall have the option to be turned on by a third party switch or third party device with a compatible contact closure output.

1.2.3 Dual 24 Hour Solar Powered Flashing Beacon

1.2.3.1 Overview

This specification is for the solar powered 24 hour flashing beacon. Each unit shall consist of a self-contained solar engine, two LED signal modules and signal housings, and mounting hardware to fit the
installation. The solar engine shall connect to two 12” yellow or red LED lens. The solar engine, mounting hardware, and signal heads shall be available in black, yellow, and green. See Diagrams 2.

Diagram 2. 
Dual Beacon 
Compact – Top of Pole Mount 
(4 ½” Round)

1.2.3.2 Mechanical Specifications

The weight of the solar engine shall not exceed 52 pounds. The solar engine must be able to rotate 360 degrees and tilt for maximum solar energy collection. Batteries shall be field replaceable.

1.2.3.3 Signal Housing

The signal housings shall be constructed of polycarbonate material, and must be adjustable independent from the bracket for lens alignment. The signal housings shall meet the equipment standard of the Institute of Transportation Engineers Vehicle Traffic Control Signal Heads (VTCSH) Chapter 2. The lenses shall be ITE compliant 12” yellow LED lenses.

1.2.3.4 Standards

The system shall conform to all standards for flashing beacons as required in the Manual of Uniform Traffic Control Devices 2003 Edition Revision 1 or current version. These include complying with the VTCSH specifications.

- The flash rate shall be MUTCD compliant.
- The beacons shall have a night dimming feature.
- The beacons shall have a minimum operating autonomy of 30 days
- The beacons shall automatically reduce light output in case of low battery situations, reducing risk that the beacons will fail entirely under conditions of poor solar insolation.

1.2.4 Dual Solar Powered School Flashing Beacon

1.2.4.1 Overview

This specification is for the solar powered school flashing beacon. Each unit shall consist of a solar engine, two LED signal modules and signal housings, and mounting hardware with timing device. The system shall confirm to all provisions of the MUTCD, Chapter 4K, and Flashing Beacons.

1.2.4.2 Mechanical Specifications

The solar engine shall be vented to provide cooling of the battery and electronic system. Venting shall be covered by wire mesh to prevent intrusion of insects. The solar engine shall have the provision to
mount an external device for remote activation. System must have capability to power such device. Unit must provide a cabinet or contain sufficient space to house third party device inside a sealed enclosure.

1.2.4.3 Solar / Battery System

The solar engine shall have a field replaceable sealed lead acid battery or batteries. Solar panel or panels and battery system shall be 12 Volt DC.

The solar panel or panels shall meet the design qualification and type approval of photovoltaic modules in accordance with IEC 61215. This specification includes radiation testing, thermal testing, and mechanical testing for environmental conditions such as UV-exposure, thermal cycling, as well as degradation of maximum power output.

Battery or Batteries shall be mechanically secured into the housing.

System shall have an auxiliary 12 VDC power output to power third party devices such as wireless radios or sensing equipment.

1.2.4.4 Signal Housing

The signal housings shall meet the equipment standard of the Institute of Transportation Engineers Vehicle Traffic Control Signal Heads (VTCSH) Chapter 2.

1.2.4.5 LED Signal Module


1.2.4.6 Standards

The system shall conform to all standards for flashing beacons as required in the Manual of Uniform Traffic Control Devices 2003 Edition Revision 1 or current version.

- The flash rate shall be MUTCD compliant.
- The beacons shall have a minimum operating autonomy of 30 days
- The beacons shall automatically reduce light output in case of low battery situations, reducing risk that the beacons will fail entirely under conditions of poor solar insolation.

1.2.4.7 Activation

The beacon shall operate continuously when the battery is connected. The beacon shall have the option to be turned on by a third party switch or third party device with a compatible contact closure output. A timer shall be included in this as an option.

1.2.5 Dual Compact Solar School Zone Flasher

1.2.5.1 Overview

This specification is for the Dual Compact Solar School Zone Flasher.
Each unit shall consist of a self-contained solar engine, two LED signal modules and signal housings, and mounting hardware such that the entire assembly with the exception of the bottom LED mounts to the top of the pole. The solar engine shall contain all electronics, batteries & solar panels. No additional cabinet is required. The system shall conform to all provisions of the MUTCD, Chapter 4K, and Flashing Beacons. See Diagram 3.

1.2.5.2 Mechanical Specifications

The Solar panel shall be mounted to the solar engine. All batteries and electronics shall be mounted in the solar engine, with no external control cabinet or battery cabinet required. The solar engine shall be vented to provide cooling of the battery or batteries and electronic system. Venting shall be covered by wire mesh to prevent intrusion of insects.

The solar engine shall have the provision to mount an external device for remote activation. System must have capability to power such device. Solar engine must contain sufficient space to house third party device inside a sealed enclosure located inside the solar engine.

The overall weight of the assembly, including mounting hardware, signal housing, LED module, and solar engine shall not exceed 55 lbs.

1.2.5.3 Solar / Battery System

The solar engine shall include a minimum 10-watt solar panel. The solar engine shall house a replaceable sealed lead acid battery or batteries. Solar panel and battery system shall be 12 Volt DC.

The solar panel shall meet the design qualification and type approval of photovoltaic modules in accordance with IEC 61215. This specification includes radiation testing, thermal testing, and mechanical testing for environmental conditions such as UV-exposure, thermal cycling, as well as degradation of maximum power output.

The solar panel shall consist of one single solar panel, mounted to the solar engine.

Battery shall be mechanically secured into the housing. Battery bracket shall enclose the battery in a manner to restrict the thermal expansion of the battery.

System shall have an auxiliary 12 VDC power output to power third party devices such as wireless radios or sensing equipment.

1.2.5.4 Signal Housing

The signal housing shall meet the equipment standard of the Institute of Transportation Engineers (ITE) Vehicle Traffic Control Signal Heads (VTCSH) Chapter 2.
The signal head shall be easily removable from the assembly. The signal housing must be adjustable independent from the bracket for lens alignment.

1.2.5.5 LED Signal Module


1.2.5.6 Operational Specifications

The system shall conform to all standards for flashing beacons as required in the Manual of Uniform Traffic Control Devices 2003 Edition Revision 1 or current version.

The beacon shall be flash at a rate set by MUTCD. The illuminated period of each flash shall not be less than one-half and not more than two-thirds of the total cycle.

- The beacon shall have a night dimming feature.
- The beacon shall have a minimum operating autonomy of 30 days.
- The beacon shall automatically reduce light output in case of low battery situations, reducing risk that the beacons will fail entirely under conditions of poor solar insolation.

1.2.6 Warranty

The Vendor shall furnish SCDOT with any warranties on equipment and materials that are provided by the Manufacturer or Vendor as normal trade practice.

1.3 Measurement

Furnishing a Solar Powered Flasher Assembly shall be measured by EACH and shall include all electrical connections and all required mounting and incidental hardware.

1.4 Payment

Furnishing a Solar Powered Flasher Assembly, accepted and measured as provided above, will be paid at the contract unit price bid for:

<table>
<thead>
<tr>
<th>Description</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Furnish Single Beacon/Compact/Model R247C (Includes All Associated Hardware For A Complete And Operational Assembly)</td>
<td>EA</td>
</tr>
<tr>
<td>Furnish Single Beacon/Standard/Model R247 (Includes All Associated Hardware For A Complete And Operational Assembly)</td>
<td>EA</td>
</tr>
<tr>
<td>Furnish Dual Beacon Compact/Model R247 Dual (Includes All Associated Hardware For A Complete And Operational Assembly)</td>
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<tr>
<td>Furnish Dual Beacon Standard/Model R829 (Includes All Associated Hardware For A Complete And Operational Assembly)</td>
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<td>Furnish Dual Beacon Compact/Model R829C (Includes All Associated Hardware For A Complete And Operational Assembly)</td>
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<td>Furnish Dual Beacon Compact/Model R829C-D4 (Includes All Associated Hardware For A Complete And Operational Assembly)</td>
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### Supplemental Technical Specifications

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Supplemental Technical Specification for

General Provisions

SCDOT Designation: 675.0

1.0 Turn Key Project

Unless noted otherwise on the plans or in the Special Provisions this is a “turn-key” project, with the contractor furnishing and installing all equipment, complete and operational to the satisfaction of the Engineer. The CONTRACTOR will install the traffic signal(s) to provide a completely modern installation. At Project completion all traffic signals/equipment shall be complete and operational, to the satisfaction of the Engineer.

1.1 Plans

- The PLANS are schematic in nature, showing what is generally expected at each intersection. The CONTRACTOR must devise/refine the final details, working within the Specifications, the Standard Drawings, and with the Engineer.
- Deviations from the Plans must be approved by the Engineer.
- After the completion of the project, the CONTRACTOR shall furnish to the District Traffic Engineer, three (3) "red-lined" sets of Plans detailing deviations from the plans and showing the exact locations and sizes of all conduits, poles, pedestals, splice boxes, detectors, and the routing and destination of all wires leaving the control cabinets.

1.2 Temporary Items / Temporary Adjustments

If Plans or Engineer indicates temporary items or adjustments are necessary, the contractor shall perform as indicated below:

- Provide new equipment that is to be removed after all the signal work is completed,
- Relocate existing signs or equipment to another location,
- Shift existing signs or equipment slightly for work zone setups.
- Any new equipment will be paid using the appropriate furnish and install pay item based on the quantity installed. The items installed become the property of SCDOT. If Engineer indicates temporary items are to be removed at the end of the contract, Contractor shall deliver these items to the appropriate signal shop. Remove and Salvage of temporary items shall be included in Remove and Salvage pay item in accordance with 688.1 Removal, Salvage and Disposal.
- Relocated items will be paid using the appropriate install pay items based on the quantity installed.
- Shifting signal heads and/or signs along the existing span wire or mast arm shall be incidental to the work required for continuity of operations.
- Use fully reliable, fully functional temporary equipment of good appearance.
- Install temporary signals in accordance with SCDOT specifications.
- Relocated or adjusted signal equipment are considered “temporary”, unless specified otherwise on the Plans. The CONTRACTOR shall plan and stage the work so that the result is a traffic signal installation conforming to the plans and using all NEW equipment.
- Signal heads shall be shifted side-to-side to be over traffic lanes as the traffic lanes are opened or closed to traffic.
- The location of temporary and final signal poles will be approved by the ENGINEER. The CONTRACTOR shall furnish the temporary and final wood poles as necessary for Continuity of Operation. Provide back guys for wood poles, sufficient to keep the pole vertical.
- Contractor may re-use minor equipment in temporary adjusted configurations, but not in the final configuration. This includes steel cable, electrical cable, conduit, pedestrian buttons and signs, and splice boxes not utilized in the new signalization. The CONTRACTOR shall furnish sufficient steel cable and electrical cable to provide Continuity of Operation.
- Contractor shall coordinate and cooperate with any utility owning joint use poles in order to maintain signal continuity.
- Transfer highway signs on existing steel cable (span wires) to the adjusted spans, and place in the same physical alignment. (Ground mounted signs are covered in Section 107.11 of the STANDARD SPECIFICATIONS.)
- The CONTRACTOR shall install temporary electric service(s) as necessary to operate the signal(s).
- Coordinate with the local power company.
- Contractor shall obtain all necessary permits or licenses.
1.3 Transfer of Operations (Continuity of Operations from existing to temporary or from temporary to final)

- Provide Full Continuity of Operation; Transfer operation to the new or temporary controller, simultaneously turning off the old controller.
- The Maintenance of Traffic (as provided in the Traffic Control Plan), and the SAFETY OF TRAFFIC is of prime importance. Continuous Operation of traffic signals enhances safety. Contractor shall NOT arbitrarily turn off signals for convenience. Instead, construct the adjusted, temporary or new signal and smoothly transfer operation to that signal. When the ENGINEER gives permission to briefly turn off a signal, provide complete intersection control using a flagger and/or Police traffic direction.
- Existing traffic signals shall REMAIN IN OPERATION until the new/modified installation has been satisfactorily tested, and placed in operation. Accomplish the testing without hazard to the traveling public and while the signal heads are suitably BAGGED WITH BURLAP.
- Covered all signal heads in place, but not in use, with BURLAP. NOTE: PLASTIC BAGS ARE NOT ACCEPTABLE.
- Adjustments in the existing equipment made necessary by the new installation are incidental to the signal construction.
- After approval is received from the Engineer, switch the new signal heads into service during that controller phase being displayed by the existing equipment; turn off the existing equipment simultaneously. After the new signal equipment has been made operational, immediately turn off the existing signal heads, and remove.
- The CONTRACTOR shall completely coordinate work between sub-contractors, and shall carefully stage the project to minimize the impact to traffic.

1.4 Operations during Construction

- The contractor shall be responsible for the operations of all existing and newly installed signals from the notice to proceed of the project until final acceptance of the project.
- There is no separate pay item for operations during construction; Operations is simply part of the construction process and is incidental to the construction.
- Fixed time operation of signals is not acceptable. Maintain detection for the life of the project. Install and operate the temporary actuation devices; transfer operation to the temporary devices prior to demolition of the existing loop detector systems.
- If detection is damaged and cannot be immediately repaired or temporary lane configurations are required, CONTRACTOR shall provide temporary equipment to provide operational detection during the life of the construction project, using video detection or other approved detection method.
- It is not permissible to adopt "uncoordinated" operation of adjacent signals; if damage to the existing interconnection cable has been broken, Contractor shall repair it immediately. If the installation of a new signal within or adjacent to an existing signal system occurs, provide interconnection to the new signal as soon as it is operational. Ensure appropriate communications is available to communicate with the signal system.
- The District Traffic ENGINEER will provide temporary controller time settings for changing traffic conditions during construction. These temporary time settings may occur throughout the project life; Contractor shall implement these timings as directed by the Engineer; this work is incidental to the contract.
- Plan the work to cause minimum interference with any existing signal operation.
- The CONTRACTOR shall not change the phasing or other operation of a signalized intersection without the approval of the District Traffic Engineer.
- Ensure the signal controller has the correct settings on the time clocks to local legal time, where needed.

1.5 Maintenance / Repairs

- The contractor shall be responsible for the daily maintenance and repairs and emergency repairs for all existing, temporary and any newly installed signals in the project from the notice to proceed until final acceptance of the project. The CONTRACTOR is responsible and liable for proper and safe operation of each signal. The CONTRACTOR shall perform EMERGENCY REPAIRS AND SERVICES as required, to ensure continuity of operation of listed traffic signals and associated equipment. This shall include replacement of malfunctioning LED modules.
- Contractor and District Electrical Supervisor shall perform a walk thru of all signals to determine if any repairs are needed prior to the contractor assuming maintenance responsibility. After the contractor assumes maintenance responsibility, the contractor also assumes financial responsibility for repairs until final acceptance.
- The Contractor shall retain ownership of the materials and equipment provided in the project until Final Acceptance (see Final Inspection & Final Acceptance) has been made by the Engineer, when it then becomes SCDOT property.
There is no separate pay item for maintenance during construction; maintenance is simply part of the construction process and is incidental to the contract.

The CONTRACTOR shall provide at least one (1) qualified LOCAL signal technician, subject to call at all times, to provide emergency services as required to assure continuous and efficient operation of signal installations and systems. This shall include non-business hours, weekends, and holidays. The Technician shall be fully qualified to trouble-shoot, service, repair and/or replace traffic controllers and components, both electro-mechanical and solid-state. At the PRE-CONSTRUCTION CONFERENCE, the CONTRACTOR shall furnish the RCE with a LIST OF THE SIGNAL TECHNICIANS who will be responsible for performing the emergency service, and the LOCAL PHONE NUMBER(S) of the CONTRACTOR's agent(s) (answering service, etc.), who will receive emergency calls during and after the CONTRACTOR's normal business hours.

The CONTRACTOR shall be ON-SITE of the malfunctioning signal for emergency service within the maximum time listed in the following schedule-

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<td>2. 6 PM to 6 AM</td>
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<th>ii. Sundays or Holidays</th>
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Once the CONTRACTOR has started repair work/emergency service the CONTRACTOR shall restore a malfunctioning signal to normal phase operations uninterrupted.

The CONTRACTOR shall maintain a LOG of all trouble calls received, the response time, and the corrective action taken. The records and logs shall be available to Department personnel for review during normal working hours. All records and logs shall be turned over to the Department at FINAL ACCEPTANCE.

In the event the CONTRACTOR fails to perform in accordance with requirements and schedules of this Specification, the Department reserves the right, without notice to the CONTRACTOR, to engage a Third Party to perform the maintenance and emergency service necessary to assure continuous traffic signal operation. Further, all expenses incurred by the Department in implementing this option, shall be deducted from the payment due the CONTRACTOR, plus a FIFTEEN HUNDRED ($1500) DOLLAR PENALTY FOR EACH OCCASION, FOR EACH DAY (UNTIL CORRECTED). The penalty shall be forfeited as liquidated damages.

1.6 Utility Coordination

The CONTRACTOR, prior to the beginning of any construction activity, shall coordinate as necessary with the Utility Company supplying the power for this project.

1.7 Contract Schedule

Unless noted otherwise in the Special Provisions, the CONTRACTOR shall furnish the Engineer with a WEEKLY SCHEDULE for the TRAFFIC SIGNAL CONSTRUCTION work, each Friday, for the week to come, listing the location and date of each intended activity. This will permit scheduling signal inspection personnel. Deviation from this schedule may cause the Department to delay Inspection and Payments.

Any work performed without notification of the proper parties in the Department, will be treated as unauthorized work (see Section 105.11 of the Standard Specifications), and could result in nonpayment to the CONTRACTOR for that work.

1.8 Permits, Codes, Licenses, & Abilities

Perform all work in a safe and workmanlike manner, to meet the highest industry standards, all in accordance with the requirements of the latest editions of the National Electrical Code (NEC), the National Electrical Safety Code (NESC), the Illuminating Engineering Society (IES), the American National Standards Institute (ANSI), the National Electrical Manufacturer's Association (NEMA), and the regulations and standards of the local power company.

The prime contractor or subcontractor responsible for the performance of the work must be licensed by the SC Licensing Board For Contractors and possess a Journeyman Card issued by the South Carolina Municipal Association or as required by the city in which work occurs at the time work is performed.

Further, at least one ‘ON-SITE’ field supervisor shall have LEVEL II or higher, Traffic Signal Certification by the International Municipal Signal Association (IMSA). Photo copies of the license and certificate (for both above) shall be submitted before work commences. The CONTRACTOR shall retain employee(s) holding the above certificate for the duration of the project; and the employee(s) shall be present DAILY and at the FINAL INSPECTION.

The CONTRACTOR shall employ persons capable of programming traffic signal controllers of the type used by this project. The CONTRACTOR shall possess both a desktop and a portable (laptop) computer, and be capable of using them to upload and download signal operating parameters.
• In addition to the state requirements, all permits and licenses required by a City/County are the responsibility of the CONTRACTOR.
• The CONTRACTOR shall arrange with the utility company for hookup connections and attachment agreements.

1.9 Integration

• Integration will be performed by SCDOT or local government signal maintenance staff; contractor shall coordinate with SCDOT to determine project schedule and time frame for integration. Contractor shall not expect SCDOT or local government signal maintenance staff to provide integration without 2 weeks’ notice and mutually agreed upon schedule of completion, including time frame for cabinets/controllers/conflict monitors to be provided at the signal shop; if signal maintainers have any issues with equipment provided, they will contact contractor to inform them to replace said equipment within reasonable time frame and to meet project schedules.

1.10 Equipment

• SCDOT Supplied Equipment - The Department will not furnish signal equipment, unless noted otherwise in the Special Provisions or on the Plans.
• Contractor Supplied Equipment - The CONTRACTOR shall furnish all new equipment (submittal of invoices required), including incidental items; used, refurbished equipment or any equipment with less than 80% of the warranty remaining at installation will not be accepted.
• Compatibility
  a. If additional equipment is required during the life of this contract due to a Change Order or Extra Work, CONTRACTOR shall purchase equipment from the same manufacturer as the original item, to ensure compatibility.
  b. When installing equipment such as signal heads or pedestrian equipment, where some existing equipment is being retained, the contractor shall provide the same type of equipment, as is remaining, for visual compatibility.
• The CONTRACTOR shall submit for approval a list of equipment including make, model number, manufacturer serial numbers, warranty information, purchase invoice, and purchase date. Documentation only has to be submitted for the furnish items required for this contract. At the time of such submission, the CONTRACTOR shall provide a copy of the Transmittal Letter, to SCDOT.
• If equipment is on the SCDOT Equipment Contract or the SCDOT QPL, catalog cut sheets do not have to be provided. On all other equipment, the CONTRACTOR shall submit for approval, catalog descriptions and documentation--THREE (3) COPIES--for each class of signal equipment and materials furnished by the CONTRACTOR. They are to be submitted TWO WEEKS PRIOR TO INSTALLATION to the Construction Office FOR APPROVAL. At the time of such submission, the CONTRACTOR shall provide a copy of the Transmittal Letter, to SCDOT.
• Equipment substitutions in the life of the contract are only allowed if the contractor can show a valid hardship in remaining with the originally submitted equipment. A valid hardship may include drastic price increases, non-availability of type of equipment due to unforeseen delivery or material shortages (contractor ordering equipment late does not apply), vendor going out of business, etcetera. SCDOT may allow equipment substitutions if product is of better quality than originally submitted or if contractor is replacing non-QPL items with QPL or SCDOT Equipment Contract items, or if equipment is experimental in nature and SCDOT wants to test said equipment.
• SCDOT will not pay for furnish and/or installation costs of any materials installed without prior approval and acceptance. Contractor shall provide letter from the manufacturer of the cabinet and from the manufacturer of the controller indicating the equipment provided is the SCDOT QPL qualified equipment; Contractor shall ensure all warranties, serial numbers, documentation, and receipts are provided with cabinet assembly and controller delivery.
1.11 Inspection

- INSPECTION is the responsibility of SCDOT. SCDOT will designate those individuals responsible for inspection. For signals located within a local government with which SCDOT has a signal maintenance agreement, the inspection personnel may include local government personnel.
- The CONTRACTOR is advised that in any dispute between the Contractor and the Manufacturer, concerning the operation/maintainability/reparability of any piece of equipment, THE DECISION OF THE DEPARTMENT SHALL BE FINAL.
- SCDOT’s designated inspector will provide a punch list of outstanding items to be addressed prior to Final Inspection.

1.12 Final Inspection & Final Acceptance

- The contractor should not request a final inspection if the punch list items are not completed.
- The CONTRACTOR shall request Final Inspection one week prior to the desired day of inspection. Confirmation to the Resident Construction Engineer shall be provided forty-eight (48) hours prior to Final Inspection, that the project is on schedule and ready for inspection.
- Burn In Upon completion of the Final Inspection and correction of any deficiencies, the work will be subject to a sixty (60) day operational test (burn in), during which the contractor remains responsible for any maintenance or repairs of any deficiencies. If during this period, a problem arises a NEW sixty (60) day test period shall begin. Prior to Final Acceptance, if the materials or equipment are damaged or are in disrepair, the Contractor shall be responsible for repair or replacement.
- Final acceptance occurs 60 days after all punch list items are completed and signal is accepted by SCDOT. During this 60 day period, contractor remains responsible for maintenance of signals and any emergencies which may arise.
- Final Acceptance Contractor will officially transfer all equipment, including warranties to SCDOT. SCDOT will become responsible for signal operations and maintenance after 60 days of trouble-free operation and official final acceptance of entire project.

1.13 Mobilization

- Section 103.10, 103.11 of the STANDARD SPECIFICATIONS is amended as indicated below:
- For traffic signal projects, payment for 1031000 (LS) Mobilization includes all the signals and signal related work in the contract.
- For traffic signal projects, payment for 1031010 (EA) Mobilization will be paid per traffic signal (Each) or per ¼ mile for fiber installation (Each).
- These prices shall include demobilization.

<table>
<thead>
<tr>
<th>Item Number</th>
<th>Description</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1031000</td>
<td>MOBILIZATION</td>
<td>LS</td>
</tr>
<tr>
<td>1031010</td>
<td>MOBILIZATION</td>
<td>EA</td>
</tr>
</tbody>
</table>

- For traffic signal projects, payment for Mobilization of Material pay item addresses payment for moving large items furnished by SCDOT, such as concrete poles, requiring special equipment like boom trucks, to the project site from a location designated by SCDOT.

<table>
<thead>
<tr>
<th>Item Number</th>
<th>Description</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>9610021</td>
<td>MOBILIZATION OF MATERIAL PER WORK ORDER, 1-100 MILES FROM LOCATION TO WORKSITE</td>
<td>EA</td>
</tr>
<tr>
<td>9610022</td>
<td>MOBILIZATION OF MATERIAL PER WORK ORDER, 101-250 MILES FROM LOCATION TO WORKSITE</td>
<td>EA</td>
</tr>
<tr>
<td>9610023</td>
<td>MOBILIZATION OF MATERIAL PER WORK ORDER, 250+ MILES FROM LOCATION TO WORKSITE</td>
<td>EA</td>
</tr>
</tbody>
</table>

1.14 Payment for Materials on Hand

Section 109.7 of the STANDARD SPECIFICATIONS is amended to include the following paragraphs.

When permitted by the Engineer, partial payment will be made for major traffic signal items that are being furnished by the CONTRACTOR. Certain items such as wooden poles, and other very heavy units not readily movable or vandalized, may be stored in un-secured locations either ON- or OFF-SITE. Other items such as signal heads, detector amplifiers, controllers, cabinets, and certain other major items may be stored in a secured/protected location either ON- or OFF-SITE. The equipment shall be labeled stating SCDOT, and the Project Name. Other requirements of Paragraph 109.8 remain applicable. Payment shall be in accordance with the following criteria:

The Contractor may be paid at FIFTY (50%) PERCENT of the contract unit price of item, not to exceed the paid invoice amount.
1. Only items measured by ‘EACH’ shall be eligible.
2. Only items with a unit price exceeding $500 shall be eligible.
3. The total invoice price of the items shall exceed $10,000.

1.15 Maintenance of Traffic (Traffic Control)

- The Contractor shall execute the item of Traffic Control as required by the Standard Specifications, the plans, the Standard Drawings For Road Construction, these supplemental specifications, the MUTCD, and the Engineer.
Supplemental Technical Specification for

Electrical Conduit

SCDOT Designation: 675.1

1.1 Description

This work shall consist of furnishing and installing Electrical Conduit and fittings of the types and sizes specified herein, at locations shown on the Plans, or as established by the ENGINEER in accordance with these Specifications.

1.2 Materials

- Use sunlight resistant PVC (Polyvinyl chloride) Conduit SCHEDULE 80, meeting the requirements of National Electrical Manufacturing Association (NEMA) Specification TC-2 and Underwriter Laboratory (UL) standards UL-514; and/or ASTM D-1784. Fittings shall meet NEMA TC-3 an UL-514.
- Use SCHEDULE 80 HDPE (High Density Polyethylene) Rolled Conduit.
- Use Flexible Weather-Tight Steel Conduit consisting of flexible single strip, helically wound, interlocking galvanized steel. Ensure the steel conduit is made liquid-tight using an extruded polyvinyl chloride jacket and that it meets the requirements of UL-360.
- Use fittings that are made of the same material and quality as the conduit run, including conduit bodies, 90° bends, weatherheads, elbows, nipples, couplings, and other hardware.
- Use Conduit Junction Boxes that are non-metallic PVC molded junction box with a weather tight screw-down cover, of nominal size 6"W x 6"L x 4"D.
- Use threaded Grounding Bushings made of malleable iron, galvanized steel, or brass; and shall have an insulating plastic insert, and lay-in lugs to hold No. 6 AWG copper wire.
- Use a Pulling Line made of Polypropylene Rope, having a minimum tensile strength of 240 pounds.
- Use Underground Warning Tape that is Heavy duty B-720 polyethylene, 0.89 mm (3.5 mils) thick, by 76 mm (3 in) wide, with APWA color RED, for electric lines.
- Use minimum 14 Ga. Tracer Wire

1.3 Construction

1.3.1 General

- The requirements detailed in this specification cover any other pay item not listed in Payment but pertaining to Electrical Conduit.
- Install conduit as Riser, or Underground.
- Install Underground Conduit as Trenched, Bored and Jack or Directional Bored in accordance with the plans and Standard Drawings.
- Concrete used for patching pavement shall be DOT STANDARD SPECIFICATION CLASS X according to Sections 701,702,703, and 704.
- Bituminous Concrete for patching pavement shall be DOT STANDARD SPECIFICATIONS, Section 400 and 403.
- All materials will be subject to inspection for condition by the ENGINEER, just prior to incorporation into the work.
- Use standard bends, elbows, or by bending the steel conduit to make changes in direction of conduit. Steel conduit, if bent, shall have a uniform radius which will fit the location, with a minimum radius of six (6) times the internal diameter of the pipe. Sharp kinks in the conduit or the substitution of unlike materials will not be permitted.
- Use standard manufactured conduit bodies, condutlets, weatherheads, elbows, nipples, tees, reducers, bends, couplings, unions, etc., of the same materials and treatment as the straight conduit, as required throughout the conduit line. Tightly connect all fittings to the conduit. Use a SOLVENT-WELD CEMENT for fitting connections with PVC conduit. Where steel conduit mates PVC, use an adapter coupling and waterproof seal.
1.3.2 Riser

- Use nipples to eliminate cutting and threading where short lengths of conduit are required. Where it is necessary to cut and thread steel conduit, no exposed threads will be permitted. All conduit fittings shall be free from burrs and rough places; and all cut conduits shall be reamed before fittings and cables are installed. All conduit runs ending in a junction box, hand box, or other approved junction point, shall be provided with a bushing to protect the cable from abrasion. Cap future use conduit.
- Attach conduit risers to wood poles; or where specified, to the outside of steel poles. Use stainless steel bands for steel poles. Use conduit clamps/straps and galvanized screws on wood poles. Attachment shall be in accordance with the plans or Standard Drawings. Furnish each Riser with a weatherhead, which shall not be measured.

1.3.3 Trenched

- Unless shown otherwise, place conduits at a minimum depth of 18 inches below surface grade, and slope at a minimum rate of 6 inches per 100 feet of length, to a splice box/junction box hole or drain. Clean and swab all conduit runs before installing cables. Use DUCT-SEAL in poles, cabinets, and buildings to seal the opening.
- Where conduit passes under a curb, cut an `X' in the curb, over the conduit. Where there is no curb, drive a stake in the ground at the end of the conduit to mark its location. Cut an `X' to indicate the side the conduit enters, where conduit is placed in a signal pole foundation for future use.
- Restore all cuts, trenches, and openings to the original condition. Replace grass surfaces with pre-grown, cut turf (sod), in existing lawns. Rake, seed and fertilize other dirt areas. Replace any damaged trees and shrubs.

Trenching (Non-Paved Surface)

- Excavate the trenches to such depth as necessary to provide 18 inches minimum cover over the conduit. Cinders, broken concrete, or other hard abrasive materials will not be permitted in the back-filling. Clear the trench of such materials before placing the conduit. No conduit shall be placed prior to inspection by the ENGINEER. Compact the back-fill and restore the surface.

Trenching (In Paved Surface)

- Cleanly saw cut trenches across driveways or streets about 6 inches wide. Place the conduit and compact the back-fill. Provide and install the patch of like material and thickness as was removed. NO additional payment shall be made for the bituminous or concrete patching material, unless a pay item has been established for such.

Bored and Jack (Pushing)

- If pay item is provided, place steel conduit under existing roadways, driveways, sidewalks or other paved surfaces by Bore and Jack method. Such conduit shall be placed by jacking, boring, pushing, or other means approved by the ENGINEER, without cutting or removing pavement.

Trenchless (Directional Bored)

- If pay item is provided, place Schedule 80 PVC or Schedule 80 HDPE conduit under existing roadways, driveways, sidewalks or other paved surfaces by directional bore method. Conduit shall be buried at a minimum of 36 inches. Payment will not be made for damaged or crumpled conduit. An acceptable alternative material can be SCHEDULE 80 HDPE CONDUIT (TRENCHLESS).

Placed Before Pouring

- Install PVC conduit w/ Flexible Weather Tight conduit firmly attached to the bottom reinforcement bar mat or to the bottom wire mat, using plastic tie-wraps every 2 feet, at locations where conduit is placed before concrete placement in a bridge deck. At expansion joints, use 4 feet (typical) of Flexible Weather Tight steel conduit to accommodate movement. Install to NEC standards for concrete structural installations and usage, including any recommended lubricants and sleeves. Plug all conduit ends to prevent concrete penetration. When used on a bridge, provide a splice-box(es) near the center line, and terminate the conduit in hand-boxes at each end.

Open Cuts in Roadway

- Open cuts are typically not allowed, and every effort to bore under roadways and driveways shall be attempted. If utility conflicts require open cuts for installation of conduit, and where approved by the Engineer, conduit may be placed in an open cut and open cuts shall be repaired in accordance with the SCDOT Utility Accommodations Policy.
### 1.4 Measurement
- Electrical Conduit will be measured by LINEAR FEET, for the type, size, and method of installation specified, along the center line of the conduit from end to end, including trenched, risers, and bored-and-jacked.
- Conduit bends, conduit bodies, (condulets), 90° bends, elbows, conduit junction boxes for detector loops, miscellaneous fittings, couplings, weatherheads, adapters, bushings, locknuts, and other items shall be incidental to conduit installation and shall NOT be measured.
- Unless otherwise specified, trenching, back-filling, and patching will NOT be measured for payment.
- If more than one conduit is installed within a directional bore, payment will be made for the directional bore from box to box. The additional runs of conduit will be paid per LF of additional conduit (pay item 675027Z) from box to box.
- F&I Encased Conduit work includes all equipment, manpower and materials to furnish and install conduit in an open cut paved area within a travel way; this work is paid by linear feet (LF):

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>6750005</td>
<td>FURNISH &amp; INSTALL 1.0&quot; GALVANIZED RIGID CONDUIT</td>
<td>LF</td>
</tr>
<tr>
<td>6750015</td>
<td>FURNISH &amp; INSTALL 2.0&quot; GALVANIZED RIGID CONDUIT</td>
<td>LF</td>
</tr>
<tr>
<td>6750025</td>
<td>FURNISH &amp; INSTALL 3.0&quot; GALVANIZED RIGID CONDUIT</td>
<td>LF</td>
</tr>
<tr>
<td>6750181</td>
<td>FURNISH &amp; INSTALL 1.0&quot; ALUMINUM CONDUIT</td>
<td>LF</td>
</tr>
</tbody>
</table>

### 1.5 Payment

#### For conduit either Trenched or Riser:
- 6750005 FURNISH & INSTALL 1.0" GALVANIZED RIGID CONDUIT LF
- 6750015 FURNISH & INSTALL 2.0" GALVANIZED RIGID CONDUIT LF
- 6750025 FURNISH & INSTALL 3.0" GALVANIZED RIGID CONDUIT LF
- 6750181 FURNISH & INSTALL 1.0" ALUMINUM CONDUIT LF

#### For bored and jacked:
- 6750078 FURNISH & INSTALL 1.0" GALVANIZED RIGID CONDUIT (BORED AND JACKED) LF
- 6750085 FURNISH & INSTALL 2.0" GALVANIZED RIGID CONDUIT (BORED AND JACKED) LF
- 6750090 FURNISH & INSTALL 3.0" GALVANIZED RIGID CONDUIT (BORED AND JACKED) LF

#### For high accuracy directional boring:
- 675027S FURNISH & INSTALL 2.0" SCHEDULE 80 PVC CONDUIT (DIRECTIONAL BORED) LF
- 675027V FURNISH & INSTALL 3.0" SCHEDULE 80 PVC CONDUIT (DIRECTIONAL BORED) LF
- 675027Y FURNISH & INSTALL 4.0" SCHEDULE 80 PVC CONDUIT (DIRECTIONAL BORED) LF
- 675027Z FURNISH ADDITIONAL CONDUIT WITHIN DIRECTIONAL BORE LF
- 6760050 FURNISH & INSTALL 1" SCHEDULE 80 HDPE CONDUIT (TRENCHLESS) LF
- 6760060 FURNISH & INSTALL 2" SCHEDULE 80 HDPE CONDUIT (TRENCHLESS) LF
- 6760070 FURNISH & INSTALL 3" SCHEDULE 80 HDPE CONDUIT (TRENCHLESS) LF
- 6760080 FURNISH & INSTALL 4" SCHEDULE 80 HDPE CONDUIT (TRENCHLESS) LF

#### For flexibility:
- 6750175 FURNISH & INSTALL 1.0" FLEXIBLE GALVANIZED STEEL CONDUIT - WEATHER TIGHT LF
- 6750179 FURNISH & INSTALL 2.0" FLEXIBLE GALVANIZED STEEL CONDUIT - WEATHER TIGHT LF
- 675017D FURNISH & INSTALL 3.0" FLEXIBLE GALVANIZED STEEL CONDUIT - WEATHER TIGHT LF

#### Open Cut:
- 6750262 FURNISH & INSTALL ENCASED CONDUIT (2-2" PVC, SCHEDULE 40) LF
- 6750263 FURNISH & INSTALL ENCASED CONDUIT (3-2" PVC, SCHEDULE 40) LF
Supplemental Technical Specification for

Electrical Cable

SCDOT Designation: 677.1

1.1 Description

This work shall consist of furnishing and installing traffic signal, loop lead-in, pedestrian signal, and pedestrian push button Electrical Cable of the size and type shown on the Plans or detailed in the Standard Drawings.

1.2 Materials

Acceptable materials can be found on the current SCDOT Qualified Products List http://info.scdot.org/Construction_D/sitePages/qualifiedProducts3.aspx.

1.3 Construction

1.3.1 General

- The requirements detailed in this specification cover any other pay item not listed in Payment but pertaining to Electrical Cable.

1.3.2 Field Wiring

- Install SPLICE-FREE cable runs. Make all connections at terminal blocks, or in the controller cabinet.
- Install all field wiring in accordance with applicable Electrical Codes—National, State, and Local. Where required, arranging for PERMITS and/or electrical INSPECTION is the responsibility of the Contractor.
- Provide at least 3 feet of cable slack at each splice box, strain pole base, and cabinet. Neatly coil and bind the slack with a nylon tie.
- At the cabinet end, label each cable, using nylon cable markers, and indelible pen, indicating the Phase and/or Approach (NB, EB, etc.).
- Cabinet connections shall correspond to the COLOR-CODE shown on the Standard Drawing 675-110-00 TYPICAL WIRE & CABLE USAGE sheet; (green wire to green signal circuit, etc.).
- Replace the entire length of cables damaged during installation, without further cost to the Department.
- All electrical cable installed in conduit shall be drawn in place, free from electrical and mechanical injury. When a lubricating agent is needed, use a wire pulling compound compatible with the cable insulation.
- Install in conduit any vertical cable runs mounted on the outside of poles as shown on the plans or in the Standard Drawings.
- Use weather service heads wherever electrical cable directly enters a strain pole or a vertical conduit run.
- Provide drip loops of at least 8 inches at all overhead entrance points such as signal heads, strain poles, or weather heads.
- If any splices in homerun cables are detected, all work will cease by the contractor in that district until new wire is pulled to replace the spliced joint.

1.3.3 Traffic Signal Wiring

- Install each cable run with the number of conductors indicated in the Standard Drawing 675-110-00 Typical Wire and Cable Usage. These include the provision of spare conductors. The substitution of additional cables to attain the required number of conductors shall not be permitted.
- Run a separate cable for each phase or approach in accordance with Standard Drawing 675-110-00 Typical Wire and Cable Usage.
- The list below is a guide to general usage--

  - Signal: Jumpers 4 pair (8 conductor) BLACK
  - Signal: To Each Approach 4 pair (8 conductor) BLACK
Loop lead-in Wiring

- Install each cable run with the number of conductors indicated in the Standard Drawing 675-110-00 Typical Wire and Cable Usage. These include the provision of spare conductors. The substitution of additional cables to attain the required number of conductors shall not be permitted.
- Run a separate cable to each corner of the intersection in accordance with Standard Drawing 675-110-00 Typical Wire and Cable Usage.
- The list below is a guide to general usage--
  
  | Loop: To Each Corner | 4 pair (8 conductor) GRAY |
  | Loop Lead-in          | 2 pair (4 conductor) GRAY |

1.3.4 Pedestrian Signal Head Wiring

- Install each cable run with the number of conductors indicated in the Standard Drawing 675-110-00 Typical Wire and Cable Usage. These include the provision of spare conductors. The substitution of additional cables to attain the required number of conductors shall not be permitted.
- Run a separate cable for each phase or approach in accordance with Standard Drawing 675-110-00 Typical Wire and Cable Usage.
- The list below is a guide to general usage--
  
  | Pedestrian Signal     | 2 pair (4 conductor) BLACK |
  | Pedestrian Push Button| 2 pair (4 conductor) GRAY  |
  | Loop Lead-in          | 2 pair (4 conductor) GRAY  |

1.3.5 Push Button Wiring

- Install each cable run with the number of conductors in accordance with Standard Drawing 675-110-00 Typical Wire and Cable Usage. These include the provision of spare conductors. The substitution of additional cables to attain the required number of conductors shall not be permitted.
- A separate cable should be run for each phase or approach in accordance with Standard Drawing 675-110-00 Typical Wire and Cable Usage.
- The list below is a guide to general usage--
  
  | Pedestrian Push Button| 2 pair (4 conductor) GRAY |

1.3.6 Electrical Conduit

All conduit and elbows shall be installed as described in the appropriate Specification. See 675.1 ELECTRICAL CONDUIT. See 688.7 CONTROLLERS AND 332/336 CABINETS. See 688.5 STEEL STRAIN POLE AND FOUNDATION.

1.4 Measurement

- With the exception of the electrical service cable, electrical cable lengths of the size and numbers of conductors specified, shall be measured by LINEAR FEET as actually furnished and installed, completely in place and accepted, with each size cable being a separate pay item.

1.5 Payment

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>6770388</td>
<td>FURNISH &amp; INSTALL NO. 14 COPPER WIRE, 4 CONDUCTOR - BLACK</td>
<td>LF</td>
</tr>
<tr>
<td>6770389</td>
<td>FURNISH &amp; INSTALL NO. 14 COPPER WIRE, 4 CONDUCTOR - GRAY</td>
<td>LF</td>
</tr>
<tr>
<td>6770393</td>
<td>FURNISH &amp; INSTALL NO. 14 COPPER WIRE, 8 CONDUCTOR - BLACK</td>
<td>LF</td>
</tr>
<tr>
<td>6770394</td>
<td>FURNISH &amp; INSTALL NO. 14 COPPER WIRE, 8 CONDUCTOR - GRAY</td>
<td>LF</td>
</tr>
</tbody>
</table>
Supplemental Technical Specification for

Fiber Optic Cable

SCDOT Designation: 677.3

1.1 Description
This work shall consist of furnishing and installing single-mode fiber optic (SMFO) cable in conduit and risers or overhead lashed to new messenger cable.

1.2 Materials
Acceptable single-mode fiber optic (SMFO) cable shall meet all requirements stated in RUS-90 and shall be an accepted product of the United States Department of Agriculture Rural Utility Service as meeting the requirements of RUS-PE-90. The cable shall be new, unused, and of current design and manufacture. More information concerning these industry standards can be found on the SCDOT website, 677.3 Fiber Optic Cable Industry Standards, http://www.scdot.org/doing/publications_Traffic.aspx.

1.3 Construction

1.3.1 General
- The requirements detailed in this specification cover any other pay item not listed in Payment but pertaining to Fiber Optic Cable.
- The CONTRACTOR shall furnish all materials and attachment hardware and installation guides necessary to install the fiber optic cable in accordance with Standard Drawing 675-125-00 Interconnect. Install fiber optic cable where, and in the manner indicated on the Plans, or as needed to maintain communications in an existing fiber network, in accordance with the standard drawings.
- The CONTRACTOR shall order cable in reel lengths that are of sufficient length to require no intermediate splicing of the cable.
- Prior to installation, the CONTRACTOR SHALL PROVIDE certified TEST RESULTS from the manufacturer showing the cable furnished has been tested and meets Industry Standards, 677.3 Fiber Optic Cable.
- The CONTRACTOR shall take every precaution to ensure the fiber optic cable is not damaged during storage and installation. Do not step on the fiber optic cable or run over the fiber optic cable by any vehicle or equipment. Do not pull the fiber optic cable along the ground or over or around obstructions.
- Ensure the fiber optic cable is packaged on wooden reels. These reels shall not contain imperfections such as broken flanges or nails that may cause damage to the cable as it is unreeled.
- Each cable reel shall have a durable weatherproof label that shows the actual length of cable on the reel.
- The CONTRACTOR shall coordinate his overhead and underground construction activities on a continuing basis with each of the utility agencies which have facilities in the immediate vicinity.

1.3.2 Bends and Tensioning
- During installation, the CONTRACTOR shall provide cable blocks at least every 50 feet to guide the cable and reduce pulling tension. All pulling equipment and hardware that will contact the cable during installation must maintain the minimum bend radius of the fiber optic cable as listed in Table 1. Corner blocks, appropriately sized to ensure that the minimum bending radius of the cable is maintained, shall be provided whenever fiber optic cable must be pulled around a corner.

<table>
<thead>
<tr>
<th>Nominal Cable Diameter</th>
<th>Minimum Bend Radius (No Tension) Installed</th>
<th>Minimum Bend Radius (Under Tension)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Millimeters</td>
<td>Inches</td>
<td>Centimeter</td>
</tr>
<tr>
<td>6.0 – 10.0</td>
<td>(1/4 – 3/8)</td>
<td>10.0</td>
</tr>
<tr>
<td>10.1 – 15.0</td>
<td>(4/10 – 6/10)</td>
<td>15.0</td>
</tr>
<tr>
<td>15.1 – 20.0</td>
<td>(10/16 – 8/10)</td>
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<tr>
<td>20.1 – 23.0</td>
<td>(13/16 – 9/10)</td>
<td>23.0</td>
</tr>
</tbody>
</table>
Fiber optic cable shall not be pulled through any intermediate junction box, manhole, pull box, pole base or any other opening in the conduit unless specifically required by the ENGINEER in specific facilities. The necessary length of cable to be installed shall be pulled from one junction box, manhole, pull box, pole base, or cabinet to the immediate next downstream manhole, box, pole base, or cabinet. The remaining length of cable to be installed in the next conduit shall be carefully stored in a manner that is not hazardous to pedestrian or vehicular traffic yet ensures that no damage to the cable shall occur. The cable shall be stored in a manner that shall allow that length of cable to be safely pulled into the next conduit. The ENGINEER shall approve the storing methods to be used.

Cable reel lagging shall remain on the cable reels until they arrive at the pulling site. If the lagging has been removed, the CONTRACTOR shall securely fasten the cable ends to avoid damage during transit.

If the cable must be unreeled during installation, use the “figure-eight” configuration to prevent kinking or twisting of the fiber optic cable. The preferred size of the “figure-eight” is 15 feet with each loop about eight (8) feet in diameter. The fiber optic cable shall not be coiled in a continuous direction except for lengths of 100 feet or less.

The CONTRACTOR shall not increase the tension on the messenger cable to which the fiber optic cable has already been lashed.

At the completion of a day’s installation, the CONTRACTOR shall protect the cable from moisture by placing a cable cap and/or several wraps of tape on the tip of the cable.

The CONTRACTOR shall record the cable meter marks at every other pole location and at the fiber splice points on a set of as-built plans. Two (2) copies of the plans showing the meter marks shall be provided to the ENGINEER. The meter marks are most easily obtained while forming drip loops.

The CONTRACTOR shall route the fiber optic cable on the inside of messenger intersections at dead ends and crossovers.

### 1.3.3 Aerial Installation

- Where the plans call for aerial installation, the CONTRACTOR shall furnish new messenger cable (see 682.3 Steel Cable) and shall lash the fiber optic cable to the new messenger.
- Install aerial cable either manually or by using the moving reel method. If the CONTRACTOR proposes to use the moving reel method, the CONTRACTOR shall submit to the ENGINEER the cable manufacturer’s recommended procedures for this installation technique at least seven (7) days prior to beginning the installation of the fiber optic cable.
- Maintain the required clearances between the fiber optic cable and the utility features as follows unless otherwise noted on the PLANS:
  - 4 inches minimum vertical clearance and 12 inches minimum total (diagonal) separation to the telephone and/or cable vision facilities.
  - 40 inches minimum vertical clearance to all electrical transformers.
  - 40 inches minimum vertical clearance to all electric lines (including street light circuits).
- Where called for on the PLANS or as directed by the ENGINEER, furnish fiberglass extension arms and utilize to install the new fiber optic cable. Provide MIF PH6-2 fiberglass extension arms or approved equal.
- Where called for on the PLANS, the CONTRACTOR shall install down guys, sidewalk guys, and aerial guys in accordance with 682.2 Back Guy and as shown in the standard drawings.
- The CONTRACTOR shall use a Kellem's® (or approved equal) grip wire mesh pulling grip and swivel to prevent damage to the cable during cable pulls.
- The CONTRACTOR shall provide drip loops for the fiber optic cable at all utility poles to which the fiber optic cable is attached. The drip loops must be of the “smooth-curve” type and shall be at least of the recommended dimensions for a drip loop in the typical details. Form drip loops by hand or by using an expansion loop-forming tool. Support the cable with straps and spacers in the absence of lashing wire support and to hold the cable bundles together. Install the strap and spacer no closer than 4 inches to the first bend in the drip loop.
- Where called for on the PLANS, the CONTRACTOR shall install backlashes in the Fiber Optic cable as necessary. The CONTRACTOR shall utilize 16 inch Fiber Optic Strand Storage Bracket (Multilink model number 2116-SSPTB or approved equivalent) which are also known as “Fiber Optic Sno Shoes”. All hardware necessary for the installation of the backlash including the “Fiber Optic Sno Shoes”, and lashing of the additional cable shall be incidental to the cost of Furnishing and Installing the Fiber Optic cable.
- The straps and spacers used for drip loops and other fiber optic cable handling purposes shall be hand-tight only. The strap and spacer must be loose enough to allow longitudinal travel by the cable, but tight enough to prevent the strap and spacer from moving on the messenger cable.
• Over lash the fiber optic cable to the messenger cable (See 682.3 Steel Cable - 1/4” galvanized steel cable). Use aluminum wrapping tape spaced at intervals not exceeding 380 mm or with 1.5 mm (minimum) diameter galvanized steel spiral cable wrap for lashing. Wrapping tape, if used shall be 1.3 mm x 7.6 mm. Use at least 4 turns. Accomplish the lashing in the manner that results in the wire and the cable appearing to be an integral part of the support cable. Install fiber optic cable without loose lashing, twisting or weaving along the messenger.

• The CONTRACTOR shall terminate the lashing wire with a lashing wire clamp as the cable run is lashed up, span-by-span. Terminate the lashing wires as follows:
  1) Place a cable spacer between the fiber optic cable and the messenger.
  2) Locate lashing wire clamp 2 inches from strap and spacer. Pull enough lashing wire out of lasher to terminate into the lashing wire clamp.
  3) Wrap the lashing wire 3 times around only the messenger between the lashing wire clamp and the planned location of the first wrap around both the strand and fiber optic cable.
  4) Secure the lashing wire as shown in the typical details.

1.3.4 Underground Installation
Where shown on the PLANS, install the fiber optic cable in new underground conduit and risers.

• Seven (7) days prior to the installation of fiber optic cable in conduit is performed, the CONTRACTOR shall provide the ENGINEER with 4 copies of the cable manufacturer’s recommended and maximum pulling tensions and a list of the cable manufacturer’s approved pulling lubricants. Only use those lubricants in the quantity recommended by the fiber optic cable manufacturer.

• When installing the cable in underground conduit, the maximum allowable pulling tension for the cable installation by the CONTRACTOR shall not exceed 70 percent of the manufacturer’s maximum pulling tension. If the cable is pulled by mechanical means, use a dynometer (clutch device) approved by the ENGINEER to ensure that a maximum allowable pulling tension is not exceeded at any time during installation.

• Fiber optic cable shall not be pulled over edges or corners, over or around obstructions or through unnecessary curves or bends. Use approved cable guides, feeders, shoes and bushings to prevent damage to the cable during installation.

• Use sealing bushings rather than weather heads on all risers containing fiber optic cable. The sealing bushings shall conform to the typical detail shown.

• Ensure conduit bends and cabinet entrance fittings used by the fiber optic cable network are designed to accommodate the bending radius limitations of the fiber optic cable used.

1.3.5 Splice
Splice the fiber optic cable only at those points shown in the PLANS. The designated splices proposed for installation in each controller cabinet consist of one of the following:

• Fibers Interconnect Centers – This splice in the cabinet shall be installed in accordance with 677.4 Fiber Interconnect Center.
  The CONTRACTOR shall pull an adequate amount of fiber optic cable into the controller cabinet to perform splicing and to provide approximately 50 feet of slack cable (approximately 25 feet from the entering and 25 feet from the exiting cable). After the fiber optic cable has been spliced, the cable shall be neatly coiled (with tie-wraps placed on the cable) and placed on top of the fiber interconnect center or on the bottom of the cabinet. The cable shall be readily accessible to enable maintenance personnel to perform splicing of the cable in a vehicle located near the controller cabinet.

• Factory Terminated Patch Panel – This aerial splice and plug into cabinet shall be installed in accordance with 677.6 Factory Terminated Patch Panel.
  Fiber optic cable runs shall be continuous between allowable splice points. The CONTRACTOR shall carefully determine the length of fiber optic cable necessary to reach from termination point to termination point. Splicing of fiber optic cable in conduit, pole bases, manholes, or pull boxes shall not be permitted.

1.3.6 Utilities
• Relocation of overhead utilities will be made by others and is not a part of this Contract.
• Where fiber optic cable is to be installed on overhead poles, the CONTRACTOR shall exercise care in temporary placement of installation equipment to provide safety to the public and to prevent damage to existing facilities. Should the CONTRACTOR cause damage to any existing cables and/or equipment, the CONTRACTOR shall immediately notify the ENGINEER and the affected owner and the CONTRACTOR shall repair or have the repair made at no additional cost.

1.3.7 Grounding and Bonding
All metal conduits shall be grounded.

All conduit, terminal cabinets, anchor bolts and reinforcing bar cages shall be made mechanically and electrically secure to form a continuous system and shall be effectively grounded. Use #6 AWG bare stranded copper wires for the grounding or bonding conductor.

Bonding of metallic conduit in pull boxes and other installations, where the conduit is not coupled, shall be coupled with metallic conduit ground bushings having smoothly rounded molded insulated inserts and bonding jumpers.

The CONTRACTOR shall furnish and install all grounding facilities.

**1.3.8 Fiber Optic Cable Tests**

- **Continuity** - Prior to the installation of any fiber optic cable, the CONTRACTOR shall test the continuity of each fiber using an Optical Time Domain Reflectometer (OTDR). The test shall be conducted while the fiber is still on the reel and the test results shall be provided to the ENGINEER.
- Contract shall provide documentation indicating that all optic fibers have been proof tested by the manufacturer at a minimum load of 50 kpsi.
- Contractor to provide documentation that all optical fibers have been 100% attenuation tested by the manufacturer. The attenuation of each fiber shall be provided with each cable reel.
- **Splice Loss** - After the installation of the fiber optic cable, the CONTRACTOR shall test the dB loss for every splice of the fiber optic cable in accordance with procedures established in the OTDR operator's manual. The testing may be done in conjunction with the splicing of the cable. Any splice that has a splice loss >0.09 dB shall be re-spliced.
- The CONTRACTOR shall provide hardcopy test results to the ENGINEER that identify the location of the splice (Intersection name, splice tray #), the fiber (by buffer tube and fiber color), and the splice loss in dB.
- **Connector/End Splice Testing** - The CONTRACTOR shall test each connector/end splice loss in one (1) direction using an OTDR in accordance with procedures established in the OTDR operator’s manual. The average mated connector/end splice loss shall be <0.5 dB. Individual mated connector pair/end loss shall be <0.7 dB. Any connector/end splice with a loss greater than 0.7 dB shall be replaced, by the CONTRACTOR. Any replacement connectors/ends shall also be tested.
- **End-to-End Attenuation Testing** - The CONTRACTOR shall perform end-to-end testing of each fiber between each place point at 1310 nm and 1550 nm in one (1) direction in accordance with EIA/TIA 526-7.
- The CONTRACTOR shall provide hardcopy test results to the ENGINEER that identify the two (2) ends of the test site, the fiber tested, the wavelength tested, the reference power output, and the system attenuation in dB.
- The CONTRACTOR shall provide OTDR Signature traces of all fibers between all intersections for system documentation and restoration purposes.

**1.4 Measurement**

Fiber optic cable, of the type and size specified will be measured by linear feet of cable actually furnished and installed, completely in place and accepted, using an “OTDR” (optical time-domain reflectometer). Such payment shall be full compensation for furnishing all material, labor, hardware, equipment and incidentals necessary for furnishing and installing communications cable and completing the work as specified.

Note that electrical conduit, splice boxes, splice cabinets, and steel span wire are listed elsewhere as separate pay items.

**1.5 Payment**

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<th>Description</th>
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Supplemental Technical Specification for

Fiber Interconnect Centers

SCDOT Designation: 677.4

1.1 Description

This work shall consist of furnishing and installing a Fiber Interconnect Center, including splicing the fiber optic cable and all necessary material to accomplish this work in accordance with this specification and standard drawings.

1.2 Materials

The Fiber Interconnect Center shall include ST adapter panel, strain relief hardware, be rack mountable, have the capacity for 4 Fusion Splice Trays and termination/connection capacity for 24 fibers in 4 modules. The Center shall be a Systimax 600G2-1U-UP-SD or approved equivalent.

The interconnect center shall be equipped with 2 fiber optic modular connector panels with 24 factory-installed interconnection sleeves. The modular interconnection panels shall be clearly labeled (transmit/receive). The interconnection sleeves shall be types ST compatible, with ceramic insert, and composite housing for single-mode fiber optic cable. These shall be Systimax MODG2-6ST-SM-PT-A and MODG2-6ST-SM-PT-B or approved equivalent.

Each interconnect center shall be furnished with 3 Fusion Splice Trays. The trays shall be capable of accepting 12 fusion and 6 mechanical splices. The tray shall be a Systimax RS-2AF-16SS or approved equivalent.

1.3 Construction

1.3.1 General

- The requirements detailed in this specification cover any other pay item not listed in Payment but pertaining to Fiber Interconnect Center.
- Multiple splices may be required to connect all incoming fibers to traffic signal network.

1.3.2 Cabinet

- Install the Fiber Interconnect Center in the controller cabinet. Place the Fiber Interconnect Center in the cabinet such that the slack fiber optic cable stored on top of the fiber interconnect center (in accordance with 677.3 Fiber Optic Cable) can be easily removed (along with the fiber interconnect center) from the cabinet and taken to a maintenance vehicle for splicing.
- Provide all necessary materials and hardware including furnishing and installing splice trays, interconnection sleeves, jumpers, and connectors needed for connecting the fiber optic cable to the signal communications network.

1.3.3 Splicing Methods

- Use the fusion-splice technique to perform all splicing, which induces less than 0.3 dB attenuation, unless noted otherwise in the special provisions. Recoat bare fibers with a protective RTV gel or similar substance prior to application of the sleeve or housing to protect the fiber from scoring, dirt, or microbending. Package each spliced fiber in a heat shrink protective sleeve or housing. Perform all splices in accordance with the cable manufacturer’s and the splice manufacturer’s recommendations. During splicing, the CONTRACTOR shall maintain the continuity of the buffer tube and fiber color.
- Provide incoming fibers with 5 feet of coiled slack and splice to a pigtail of the same type fiber. Pigtails shall have a minimum length of 5 feet and shall have a factory-installed ST compatible connector. The pigtails shall have an attenuation of less than 0.3 dB. The ST connector shall mate with the connector panels installed in the fiber interconnect center.
- Protect unused optical fibers with sealed end caps.
- The CONTRACTOR shall record the meter marks on the cable sheath at each splice point. Provide these marks to the Engineer as part of the as-built system plans at the completion of the project.
1.3.4 Jumpers

- The CONTRACTOR shall furnish and install 2 single-mode fiber optic cable assemblies with connectors factory-installed on each end (jumpers). These assemblies will be used to connect the fiber optic modem to the connector panel. These jumpers will not be paid for directly but shall be considered incidental to the item Furnish and Install Fiber Optic Modem.

1.3.5 Future Applications

- The fiber optic communications network shall accommodate future applications. As shown in the standard drawings, fusion splice all six fibers in one buffer tube of the entering cable through to the six fibers in one of the buffer tubes leaving the cabinet. Maintain the continuity of the buffer tube and fiber color. Splice these fibers in a separate splice tray. The cable entering and exiting the cabinet will contain another buffer tube that contains six fibers. Fusion-splice three of the incoming and three of the outgoing fibers to pigtail assemblies with factory-installed type ST compatible connectors. Place these six splices in a second splice tray. Fusion-splice the remaining three incoming and three outgoing fibers to pigtail assemblies with factory-installed type ST compatible connectors and placed in a third tray. Connect all pigtail assemblies to the connector panels installed in the Fiber Interconnect Center. Clearly label the Transmit and Receive designations of each fiber pair on the front of the connector panel. Test each fiber termination/connection for attenuation.

1.3.6 Fiber Optic Cable Tests

- Continuity - Prior to the installation of any fiber optic cable, the CONTRACTOR shall test the continuity of each fiber using an Optical Time Domain Reflectometer (OTDR). Conduct the test while the fiber is still on the reel and provide the test results to the ENGINEER.
- Splice Loss - After the installation of the fiber optic cable, the CONTRACTOR shall test the dB loss for every splice of the fiber optic cable in accordance with procedures established in the OTDR operator's manual. The testing may be done in conjunction with the splicing of the cable. Any splice that has a splice loss >0.09 dB shall be re-spliced.
- The CONTRACTOR shall provide hardcopy test results to the ENGINEER that identify the location of the splice (Intersection name, splice tray #), the fiber (by buffer tube and fiber color), and the splice loss in dB.
- Connector/End Splice Testing - The CONTRACTOR shall test each connector/end splice loss in one (1) direction using an OTDR in accordance with procedures established in the OTDR operator's manual. The average mated connector/end splice loss shall be <0.5 dB. Individual mated connector pair/end loss shall be <0.7 dB. Replace any connector/end splice with a loss greater than 0.7 dB. Test any replacement connectors/ends.
- End-to-End Attenuation Testing - The CONTRACTOR shall perform end-to-end testing of each fiber between each place point at 1310 nm and 1550 nm in one (1) direction in accordance with EIA/TIA 526-7.
- The CONTRACTOR shall provide hardcopy test results to the ENGINEER that identify the two (2) ends of the test site, the fiber tested, the wavelength tested, the reference power output, and the system attenuation in dB.
- The CONTRACTOR shall provide OTDR Signature traces of all fibers between all intersections for system documentation and restoration purposes.

1.4 Measurement

- This item shall include the labor, equipment, and materials necessary to furnish and install the fiber optic interconnect centers in accordance with the PLANS and Standard Drawings. This item shall be measured by the number of each installed, which shall be full compensation for furnishing and installing the fiber interconnect centers into the signal controller cabinets and making the necessary connections. The fusion splicing of the cable, furnishing and installing the splice trays, pigtail assemblies, connector panels and interconnection sleeves shall be considered incidental to this item and will not be paid directly.
- Pay item 6770486 may be used to pay for additional fiber splices required if more than one fiber trunk is to be interconnected at signal. This pay item includes all necessary items needed to provide this interconnection.

1.5 Payment

<p>| 6770476 | FURNISH &amp; INSTALL FIBER OPTIC INTERCONNECT CENTER | EA |</p>
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<td>6770486</td>
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Supplemental Technical Specification for

Factory Terminated Patch Panel

SCDOT Designation: 677.6

1.1 Description

This work shall consist of furnishing and installing a Factory Terminated Patch Panel, including splicing the fiber optic cable and all necessary material to accomplish this work in accordance with this specification and standard drawings.

1.2 Materials

Acceptable materials can be found on the current SCDOT Qualified Products List [http://info.scdot.org/Construction_D/sitePages/qualifiedProducts3.aspx].

1.3 Construction

1.3.1 General

- The requirements detailed in this specification cover any other pay item not listed in Payment but pertaining to Factory Terminated Patch Panel.
- The Contractor shall furnish the ENGINEER with any warranties on materials that are provided by the Manufacturer or Vendor as normal trade practice.
- Multiple splices may be required to connect all incoming fibers to traffic signal network.

1.3.2 Cabinet

- The factory terminated patch panel shall be installed by the CONTRACTOR between the controller cabinet and the overhead fiber optic cable run. The factory terminated patch panel shall be located in the cabinet such that the slack fiber optic cable is safely stored (in accordance with 677.3 Fiber Optic Cable).
- Provide all necessary materials and hardware including furnishing and installing interconnection sleeves, jumpers, and connectors needed for connecting the fiber optic cable to the signal communications network.

1.3.3 Splicing Methods

- When using a preterminated, molded patch panel unit that serves as the drop cable and fiber interconnect center (patch panel/fusion splice containment) the free end shall be spliced to the trunk fiber optic cable in an approved aerial enclosure according to the splice plan. The overhead splice and enclosure and all necessary materials and hardware is incidental and should be included in pay item.
- Use the fusion- splice technique to perform all splicing, which induces less than 0.3 dB attenuation, unless noted otherwise in the special provisions. Recoat bare fibers with a protective RTV gel or similar substance prior to application of the sleeve or housing to protect the fiber from scoring, dirt, or microbending. Package each spliced fiber in a heat shrink protective sleeve or housing. Perform all splices in accordance with the cable manufacturer’s and the splice manufacturer’s recommendations. During splicing, the CONTRACTOR shall maintain the continuity of the buffer tube and fiber color.
- Protect unused optical fibers with sealed end caps.
- The CONTRACTOR shall record the meter marks on the cable sheath at each splice point. Provide these marks to the Engineer as part of the as-built system plans at the completion of the project.

1.3.4 Jumpers

- The CONTRACTOR shall furnish and install 2 single-mode fiber optic cable assemblies with connectors factory-installed on each end (jumpers). These assemblies will be used to connect the fiber optic modem to the Factory terminated patch panel. These jumpers will not be paid for
directly but shall be considered incidental to the item Furnish and Install Factory terminated patch panel.

1.3.5 Future Applications
- Splice all fiber strands and connect to accommodate future applications.

1.3.6 Fiber Optic Cable Tests
- Continuity - Prior to the installation of any fiber optic cable, the CONTRACTOR shall test the continuity of each fiber using an Optical Time Domain Reflectometer (OTDR). Conduct the test while the fiber is still on the reel and provide the test results to the ENGINEER.
- Splice Loss - After the installation of the fiber optic cable, the CONTRACTOR shall test the dB loss for every splice of the fiber optic cable in accordance with procedures established in the OTDR operator's manual. The testing may be done in conjunction with the splicing of the cable. Any splice that has a splice loss >0.09 dB shall be re-spliced.
- The CONTRACTOR shall provide hardcopy test results to the ENGINEER that identify the location of the splice (Intersection name, splice tray #), the fiber (by buffer tube and fiber color), and the splice loss in dB.
- Connector/End Splice Testing - The CONTRACTOR shall test each connector/end splice loss in one (1) direction using an OTDR in accordance with procedures established in the OTDR operator's manual. The average mated connector/end splice loss shall be <0.5 dB. Individual mated connector pair/end loss shall be <0.7 dB. Replace any connector/end splice with a loss greater than 0.7 dB. Test any replacement connectors/ends.
- End-to-End Attenuation Testing - The CONTRACTOR shall perform end-to-end testing of each fiber between each place point at 1310 nm and 1550 nm in one (1) direction in accordance with EIA/TIA 526-7.
- The CONTRACTOR shall provide hardcopy test results to the ENGINEER that identify the two (2) ends of the test site, the fiber tested, the wavelength tested, the reference power output, and the system attenuation in dB.
- The CONTRACTOR shall provide OTDR Signature traces of all fibers between all intersections for system documentation and restoration purposes.

1.4 Measurement
- The bid for the Factory terminated patch panel shall include the cost of furnishing and installing the Factory terminated patch panel into the signal controller cabinets, splicing into fiber trunk overhead and making all the necessary connections.
- The fusion splicing of the cable, pigtail assemblies, connector panels and interconnection sleeves shall be considered incidental to this item and will not be paid directly.
- This item shall include the labor, equipment, and materials necessary to install the Factory terminated patch panel in accordance with the PLANS and Project Special Provisions. This item shall be measured by the number of each installed.
- Pay item 6770486 may be used to pay for additional fiber splices required if more than one fiber trunk is to be interconnected at signal. This pay item includes all necessary items needed to provide this interconnection.

1.5 Payment

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<tr>
<td>6770486</td>
<td>FIBER OPTIC REPAIR SPLICE OH/UG</td>
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Supplemental Technical Specification for

Wireless Network Communications Link

SCDOT Designation: 677.7

1.1 Description
This work shall consist of installing a Wireless Network Communications Link with all necessary hardware in accordance with the plans and standard drawings to provide a data link between field devices (i.e. Traffic Signal Controllers).

1.2 Materials
Wireless Communications Equipment provided by others (generally SCDOT). Cable shall be as follows or equal:

| Superior Essex Cabling | CAT 5e Ethernet cable |

1.3 Construction

1.3.1 General
• The requirements detailed in this specification cover any other pay item not listed in Payment but pertaining to Wireless Network Communications Link.
• The Contractor shall furnish the ENGINEER with any warranties on materials provided by the Manufacturer or Vendor as normal trade practice.
• A Wireless Network Communications Link is used to network two Traffic Signal Cabinets together. Each link consists of Master ODU (Out Door Unit, Antenna) connected to a data switch within one of the signal cabinets and a Slave ODU connected to a data switch within the other signal cabinet. Each ODU is aligned to face the opposing ODU. The cable length between the ODU and its associated data switch may not exceed 300 feet.
• Wireless Network Communications Link components at each of the linked traffic signal cabinets includes an ODU, a LPU (Lightning Protection Unit), power supply mounting hardware, and CAT 5e cabling. The ODU is pole mounted per manufacturer’s specifications. The LPU and power supply are mounted within the traffic signal cabinet. CAT 5e cable is installed between the ODU and LPU.

1.3.2 Site Survey
• Perform a radio path Site Survey test before installing any equipment. For the applicable frequency spectrum of the radios being deployed, perform a spectrum analysis to ensure no competing equipment in the area. Ensure the radio path site survey test is performed using the supplied brand of radio equipment to be deployed. Typically, if the ODUs can be mounted with clear line of sight between them, this is sufficient to ensure proper operation. If this is not possible, it may be determined that a repeater station is necessary to complete the intended link. Provide the test results to the ENGINEER for review and approval. Submit copies of the test results and colored copies of the frequency spectrum scan along with an electronic copy of this information. The ENGINEER will approve final locations of the ODUs and any necessary repeater stations.

1.3.3 Antenna
• Install each ODU in such a manner that avoids conflicts with other utilities (separation distances in accordance with the guidelines of the NESC) and as specified in the ODU manufacturer’s recommendations. Secure the ODU mounting hardware to the pole and route the CAT 5E cable such that no strain is placed on the RJ-45 connectors. Align each antenna/radio to be perpendicular to the ground (using bubble level) and to face the opposing radio.

1.3.4 Cable
• Install Cat 5E cable between the ODU and the LPU. Terminate each end with compatible RJ-45 connector. Perform end-to-end continuity test and 1 GigaBit/sec transmission tests using Ethernet Twisted Pair test gear. Provide test results to ENGINEER.
• Lightning Protection Unit (LPU)- Install LPU in Signals cabinet per manufacturer’s instructions. Connect CAT 5e cable to LPU.

1.4 Measurement
• Pay Item 677048B INSTALL WIRELESS NETWORK COMMUNICATIONS LINK BETWEEN TWO TRAFFIC SIGNALS is measured as EACH unit. This pay item includes furnishing mounting hardware and cable for ODU, installing ODU and cable, installing cabinet equipment, and adjusting ODU as needed for optimum
communications for both ends of the link (Master ODU at one signal and Slave ODU at the other signal. Actual ODUs and associated equipment provided by others (generally SCDOT).

1.5 Payment

| 677048B | INSTALL WIRELESS NETWORK COMMUNICATIONS LINK BETWEEN TWO SIGNALS | EA |
Supplemental Technical Specification for

Detector Loop

SCDOT Designation: 678.1

1.1 Description

This work shall consist of furnishing and installing a Detector Loop within and alongside the roadway, at the locations shown on the Plans, and in accordance with Standard Drawing 675-120-00. A Detector Loop installation shall consist of: installing the required conduit runs; making the pavement saw cut; placing the required number of turns of loop wire in the saw cut; creating a twisted pigtail; splicing the pigtail to the shielded, twisted pair lead-in cable; connecting the lead-in cable to the back-panel terminals at the controller cabinet; verifying proper detection of traffic; and sealing the saw cut. Several items used to create a complete detector installation are specified elsewhere. They are: FURNISH AND INSTALL ELECTRICAL CONDUIT; and FURNISH AND INSTALL SPLICE BOXES/ JUNCTION BOXES. The "junction point" referred to in the specifications below, is defined to be a splice box, or a conduit junction box as specified on the Plans.

1.2 Materials

Acceptable materials can be found on the current SCDOT Qualified Products List [http://info.scdot.org/Construction_D/sitePages/qualifiedProducts3.aspx].

1.3 Construction

1.3.1 General

- The requirements detailed in this specification cover any other pay item not listed in Payment but pertaining to Detector Loop.
- The LOCATION and SIZE of each loop shall conform to the Plans and to the Standard Drawings.
- The front of each loop shall typically located 12 to 36 inches in front of the Stop Line, however, the final location will be determined by the ENGINEER based on field conditions.
- Center loops in the traffic lane in accordance with the Standard Drawings and as shown on the Plans.
- Stage loop installation so that each entire loop installation (from saw cut to sealing) is completed within the same working day with minimum blockage of traffic.
- Cut all presence loops, left turn lanes and side streets, in a quadrupole design, in accordance with the standard drawings.
- Provide a 5-year workmanship warranty for the loops following Final Acceptance. The CONTRACTOR will return to repair or replace any loops rising up or pulling from the pavement or not functioning within warranty period at no additional cost.

1.3.2 Saw Cuts

- Prior to cutting, mark the intended saw cut using paint or chalk on the pavement and obtain approval from the ENGINEER.
- The Contractor shall slot the roadway using a diamond or abrasive rotary power-saw with a blade approximately 3/8 INCH IN WIDTH.
- Use a power-driven walk-along model saw, not a hand-tool.
- The MINIMUM DEPTH of each Saw cut shall be:
  - 2 INCHES DEEP in CONCRETE; and
  - 2-1/2 INCHES DEEP in BITUMINOUS pavement; and
  - 3 INCHES DEEP for any Quadrupole loop or loop with 4 turns.
- Cut the corners diagonally to prevent sharp edges in accordance with the standard drawings. Extend the saw cuts to provide full-depth.
- Wash out and blow dry saw cuts to ensure the cut is free from dust, grit, oil and moisture before the placement of wire. Use compressed air to blow dry.
- If the Engineer gives written approval, the curb and gutter may be saw cut. If saw cutting of curb and gutter is not permitted, drill a 1 ½-inch hole under the curb at a 45 degree angle.
Avoid pavement seams or cracks. However, when it is necessary to traverse a crack, drill a 2-inch diameter hole at least 3 inches deep, and provide slack in the loop wire to allow for expansion and contraction.

**Loop Wire**

- Install each loop wire in a continuous and splice-free manner.
- Do not install provide any wire with cuts, breaks, or nicks in the insulation. The Engineer will not accept damaged loop wire.
- Wire all loops in one direction, counter-clockwise only.
- Each loop shall have the number of turns shown below, or as indicated on the Plans.
  - 6’ x 6’, 6’ x 10’ – 4 turns
  - 6’ x 15’, 6’ x 20’, 6’ x 30’, 10’ x 20’, 10’ x 30’ – 3 turns
  - 6’ x 40’, 6’ x 50’, 10’ x 40’ – 2 turns
  - Quadrupole loops shall have twice the turns in the middle cut, and be wired in a figure eight pattern, counter-clockwise only
- Form each Detector Loop by installing one continuous length of single conductor (loop) wire in a separate saw cut, from the nearest approved "junction point", around the loop the specified number of turns, then back to the "junction point".
- Place the wire in the cut so that there are no kinks or curls, and no straining or stretching of the insulation around the corner of the slot, or at the junction.
- Press the wire to the bottom of the saw cut slot, using a roller or a blunt-stick (similar to a paint stirrer), to seat the loop wire at the bottom of the slot or channel. Do not use a screwdriver or similar sharp tool as this may damage the loop wire insulation.
- After placing the wire in the slot, recheck it for slack, raised portions, and tightness.
- Use 1 INCH LENGTHS of 1/2 inch closed-cell foam-plastic (BACKER-ROD) at 2 foot spacings, to hold the wire at the bottom of the slot. DO NOT use backer-rod around the entire perimeter!
- Form the "pigtail" by twisting together the two ends of the loop wire from the corner of the loop to the "junction point"; Twist the two ends with a pitch of 15 TURNS PER YARD;
- Enclose the loop wire pigtail in conduit from the roadway edge to the "junction point".
- TEST each loop BEFORE SEALING, to ensure inductance is in the range of 50 to 2500 micro-Henrys. Ensure the insulation resistance measured to earth ground is greater than 100 megohms at 500 volts DC. Provide MEGGER TEST and INDUCTANCE TEST before and after sealing, and provide a written record of the test to the ENGINEER on company letterhead.

**1.3.3 Lead-In Cable**

- Install the lead-in cable in a continuous run, splice-free, and free from cuts or nicks in the insulation.
- At the specified "junction point", splice the twisted "pigtail" from the loop wire to the shielded, (twisted-pair) lead-in cable that runs from the "junction point" to the controller cabinet (terminal).
- Provide an electrically permanent and waterproof seal at the "junction point" splice. Remove 1-1/2 inches of insulation from each wire. Use either a crimped-on or twisted and soldered splice. No wire nuts are allowed. Waterproof seal the entire splice using a method described below:
  a. Normal Splice – Splice each individual pair (pair of twisted loop wires meeting pair of loop lead-in wires), by using either a crimp-on or a soldered joint. Seal the junctions in a low-voltage, waterproof splice kit. Install the splice kit per the manufacturer’s instructions.
  b. Underwater Splice - Where required on the Plans, install an underwater splice kit according to the manufacturer's instructions.
- The ENGINEER must be present to witness the splicing. Any splices made without the presence of the ENGINEER are unacceptable, and shall be re-spliced.
- Leave sufficient slack in both the lead-in cable and the loop wire, to allow movement of 3 feet from the front of the "junction point". Neatly coil and nylon-tie the slack after completion of the splice.
- In the controller cabinet, label the lead-in cable on an insulated, preprinted-sleeve, slipped over the wire before attachment of a spade-lug connector. Crimp on a spade-lug connector onto each loop lead-in wire.
- In the controller cabinet, do not connect the ground (drain) wire from each lead-in cable; instead, cut it off at the cable sheath, and leave it floating.
- Run the lead-in cable in conduit (in accordance with 675.1 Electrical Conduit) from the "junction point" to the nearest signal pole, or directly to the cabinet if in the same quadrant.
- Run the lead in cable inside a conduit (riser) or metal pole, across span wires, and then down inside a conduit (riser) or metal pole, to the cabinet.
• Install one of the following for the conduit for lead-in cable required to be installed under sidewalks and curbs
  o Rigid Galvanized Steel Conduit
  o SCHEDULE 80 PVC Conduit
  o SCHEDULE 80 HDPE Rolled Conduit
  o Flexible Weather-Tight Steel Conduit

1.3.4 Sealant
• Use QPL approved Loop Sealant in all loops unless specified by the ENGINEER.
• Mix and apply Loop Sealant according to the manufacturer's directions.
• Do not pour Loop Sealant into saw cuts during precipitation of any kind, or at temperatures below 10° C (50° F).
• Completely fill the saw cut and drilled holes with Loop Sealant; do not allow bubbles below the surface; do not over fill the cut, ensuring only a minimum spillover along the joint. Use Duct-Seal to prevent sealant from flowing into conduit ends.
• When the sealant hardens, ensure there is neither a bulge nor depression, but rather a smooth road surface. Ensure the sealant is not over-poured, preventing bulges or bumps higher than the surrounding surface of the roadway. Wipe the area smooth with a squeegee.
• Ensure the sealant has hardened before allowing traffic to move over the area.

1.4 Measurement
• Detector loops shall be measured by LINEAR FEET of: loop wire, lead-in cable, and saw cut as actually placed, including sealant, electrical connections, testing, and incidental hardware. Note that conduit and splice boxes are measured elsewhere as separate items.

1.5 Payment

Loop Wire:

<table>
<thead>
<tr>
<th>Specification</th>
<th>LF</th>
</tr>
</thead>
<tbody>
<tr>
<td>6770413 FURNISH &amp; INSTALL NO. 14 COPPER WIRE, 1-CONDUCTOR FOR LOOP WIRE</td>
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Loop Lead-in cable:
See 677.1 Electrical Cable

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<tr>
<th>Specification</th>
<th>LF</th>
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<tr>
<td>6770389 FURNISH &amp; INSTALL NO. 14 COPPER WIRE, 4 CONDUCTOR - GRAY</td>
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<tr>
<td>6770394 FURNISH &amp; INSTALL NO. 14 COPPER WIRE, 8 CONDUCTOR - GRAY</td>
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Saw Cut:

<table>
<thead>
<tr>
<th>Specification</th>
<th>LF</th>
</tr>
</thead>
<tbody>
<tr>
<td>6780495 SAWCUT FOR LOOP DETECTOR</td>
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</table>
Supplemental Technical Specification for

Wireless Vehicle Detection System

SCDOT Designation: 678.2

1.1 Description
This work shall consist of furnishing a Wireless Vehicle Detection System to detect vehicles on a roadway by using battery-powered magnetometer-type SENSORS that communicate their detection data by RADIO RECEIVER &/OR REPEATERS to a CABINET INTERFACE before the data is relayed to a local traffic controller and, optionally, a central software system or a data server, or interface to such, as may be desired.

1.2 Materials

1.2.1 Overview
- The Wireless Battery-Powered Magnetometer Vehicle Detection System shall consist of one or more SENSORS installed in each traffic lane where presence detection is required, avoiding sources of magnetic noise such as underground power cables, overhead high tension power cables, light rail or subway tracks, and power generation stations and sub-stations. The SENSORS shall be located as specified by the intersection plans, with each SENSOR’S supporting CABINET INTERFACE or REPEATER installed as necessary to provide communications. Each SENSOR in an installation shall be capable of being individually configured with its own sensitivity level. A single SENSOR shall be capable of being configured with a sensitivity level that approximates the detection zone of a standard 6’ x 6’ inductive loop. Each SENSOR shall be capable of being configured with relatively higher or lower sensitivity levels as may be required to detect bicycles, motorcycles, or light rail. As an option as directed by the plans, up to two SENSORS properly configured shall be capable of detecting motorcycles in a standard traffic lane and bicycles in a designated bicycle lane. A CABINET INTERFACE shall support the relay of SENSOR detection data through several interfaces as required by the application.
- Communications between a SENSOR and RADIO RECEIVER can be direct, via a single REPEATER, or via two REPEATERS operating in tandem. Communications between the SENSORS and the RADIO RECEIVER or REPEATER and between the REPEATER and RADIO RECEIVER or another REPEATER shall be via radio. Detection data shall be relayed from each CABINET INTERFACE to a local traffic controller for real-time vehicle presence detection using contact closure signals or serial communication interface.
- As an option, data shall be capable of being relayed from each CABINET INTERFACE to a central software system or central server over standard IP (Internet Protocol) networks. An option to provide data via a web page interface may be required.

1.2.2 Radio Link
The radio links between each SENSOR and RADIO RECEIVER or REPEATER and between each REPEATER and RADIO RECEIVER or each REPEATER and REPEATER shall conform to the following requirements.
- The physical layer of the radio links (i.e., the over-the-air data rate(s), modulation type(s), forward error correction, bit interleaving, channel coding, and other aspects of the transmitted signal) shall conform to published standards (e.g., IEEE, ITU-T, etc.).
- The center frequencies, bandwidths, and transmit power levels of the radio links shall allow operation in an unlicensed frequency band.
- Frequency channels shall be employed by the SENSORS, CABINET INTERFACE, and REPEATERS to avoid interference with other devices operating in the unlicensed band.
- Either user-configurable frequency assignments or frequency hopping technology shall be provided. If frequency channels are user-configurable, at least 16 frequency channels shall be supported. If spread-spectrum/frequency hopping technology is provided ensure technology can address potentially interfering radio transmissions in the unlicensed band.
• The link budget (i.e., transmit power plus transmit antenna gain plus receive antenna gain minus receive sensitivity, where receive sensitivity shall assume a 1% packet error rate) for all radio links shall be 93 dB or greater.

1.2.3 Components
The Wireless Vehicle Detection System shall consist of one or more of the following:
• **SENSORS** - installed in-pavement in each traffic lane.
• **RADIO RECEIVER** - mounted on the side of the roadway.
• **CABINET INTERFACE** - CABINET INTERFACE located in traffic signal cabinet will provide SENSOR information processing and support the interface between a RADIO RECEIVER and a standard traffic controller using contact closure signals or standard serial communication interface such as NEMA TS2 Port 1.
• **EXTENSION MODULE** - to provide additional detector outputs to a traffic controller.
• **REPEATER/ANTENNAS** - Wireless REPEATERS/ANTENNAS mounted on the side of the roadway, either at the intersection or adjacent to set back sensors, serving to extend the radio range of a RADIO RECEIVER.
• **EPOXY, CAT5 / ETHERNET CABLE, ELECTRIC CABLE , SOFTWARE (Incidentals)**

1.2.4 SENSOR
• Each SENSOR shall detect a vehicle by measuring changes in the earth’s magnetic field near the SENSOR as caused by a stopped or passing vehicle (i.e., magnetometer-type detection). The SENSOR shall sample the earth’s magnetic field at a rate of 128 Hz. The SENSOR shall communicate time-stamped ON and OFF vehicle detection events. Each SENSOR shall automatically recalibrate in the event of a detector lock. Each SENSOR shall communicate by radio to a nearby RADIO RECEIVER or REPEATER RADIO. Each SENSOR shall transmit its detection data within 150 ms of a detected event. Each SENSOR shall automatically re-transmit a detected event if no acknowledgement is received from the access point. Each SENSOR may stop retransmission after 8 attempts. Each SENSOR shall transmit a unique identifying code. Each SENSOR shall respond within 100 seconds when the access point is powered on and transmitting. When no RADIO RECEIVER or REPEATER is present or powered on and transmitting, the SENORS are not required to detect vehicles.
• All SENSOR components shall be contained within a single housing. The SENSOR housing shall conform to NEMA Type 6P and IEC IP68 standard. The SENSOR components shall be fully encapsulated within the housing to prevent moisture from degrading the components. The SENSOR housing shall be capable of being installed in a 4 to 4.5 inch diameter hole with a minimum 2.25 inches. A SENSOR shall operate at temperatures from -37°F / -38.3°C to +176°F / +80°C. A SENSOR shall be battery-powered with an average lifetime of ten (10) years when the SENSOR is configured for and operating under normal traffic conditions.

1.2.5 RADIO RECEIVER (AT INTERSECTION)
• A RADIO RECEIVER shall support at least 48 SENSORs with a 0.125 second latency. A RADIO RECEIVER shall meet the temperature and humidity requirements of section 2.1.5 of NEMA Standard TS2-2003. All RADIO RECEIVER components (not including antennas) shall be contained within a single housing. The RADIO RECEIVER housing shall conform to NEMA Type 4X and IEC IP67 standards. A RADIO RECEIVER shall be no larger than 12"H x 8"W x 7"D.
• The RADIO RECEIVER shall communicate to the CABINET INTERFACE utilizing a standard CAT5e or higher Ethernet cable. The RADIO RECEIVER shall have a weatherproof Ethernet connector on the bottom. The Ethernet connector shall be shipped with a cover firmly attached to provide protection form the elements prior to cable connection. The weatherproof connector shall not require any specialized tools for installation.
• A means shall be provided for surge suppression and isolation between the radio receiver and the cabinet interface for a wired connection. Electrical isolation of 1000V or greater and transient / surge protection shall be provided for the interface between the Cabinet Interface and Radio Receiver. This may be provided integral to the devices or as a separate unit, or combination thereof.

1.2.6 CABINET INTERFACE
• Detection data shall be communicated to a standard roadside traffic controller via a CABINET INTERFACE capable of being installed in a standard 170 cabinet. Type 170, Type 2070 and ATC controller types shall be supported. As an option, detection data shall be communicated over TCP/IP via an integrated 10Base-T Ethernet interface or a NEMA TS2-2003 Port 1 serial interface. The CABINET INTERFACE shall be
Each CABINET INTERFACE shall be capable of communicating with at least 2 RADIO RECEIVERS. EXTENSION MODULES shall provide additional contact closures (user configurable form 1 to 4 outputs each). The CABINET INTERFACE shall provide all the higher level processing and interface functions of the system. Each CABINET INTERFACE shall provide detector data as contact closure signals to the traffic controller or via a serial communications interface. A CABINET INTERFACE shall connect to standard 170/2070 input files or NEMA detector racks. One or more EXTENTION MODULEs shall provide up to 64 channels of detection data from a single CABINET INTERFACE’s supported SENSORS, where each channel comprises an optically isolated contact closure relay and, if configured for TS2 operation, an additional output meeting TS2 requirements, to indicate the channel status. Each CABINET INTERFACE and EXTENTION MODULE shall be configurable. A CCI card shall provide contact closure signals in either presence or pulse mode. A CCI card shall provide up to 31 seconds of delay timing. A CCI card shall provide up to 7.5 seconds of extension (carryover) timing. The CCI and EXTENTION MODULE front panel shall provide status LEDs to monitor Detection channel status, and Faults. The CCI and EXTENTION MODULE front panel shall be either software or via front panel switches configurable to provide Presence or pulse mode. Delay timing and Extension timing.

A CABINET INTERFACE or EXTENTION MODULE shall be powered by the input file/detector rack backplane via an 11-26 VDC input. Power Consumption for a CABINET INTERFACE (without optional cellular interfaces) shall be under 5 watts. An EXTENTION MODULE shall be surge protected to GR-1089 standards. A CABINET INTERFACE and EXTENTION MODULE shall meet the requirements of NEMA TS2-2003, section 2.1.5 Temperature and Humidity, and section 2.1.7 Transients, Input-Output Terminals.

1.2.7 EXTENTION MODULE

- An EXTENTION MODULE shall be available to allow additional detector outputs to be interfaced to the traffic controller. When interfacing through the detector card rack, the extension module shall allow up to four detector outputs to be interfaced to detector card slot(s).

1.2.8 REPEATER/ANTENNA

- A REPEATER/ANTENNA radio communicating directly to a CABINET INTERFACE shall support at least 10 SENSORS. A REPEATER/ANTENNA communicating to a CABINET INTERFACE via an intermediate REPEATER (i.e., tandem operation) shall support at least 6 SENSORS. A REPEATER/ANTENNA shall be battery-powered, solar powered or a combination of the two. The REPEATER/ANTENNA battery shall be long-term (5+ years) and field replaceable. A REPEATER/ANTENNA shall meet the requirements of NEMA TS2-2003, section 2.1.5 Temperature and Humidity. All REPEATER/ANTENNA components shall be contained within a single housing.

1.2.9 Epoxy

- The epoxy shall be a two part poly-urea based joint sealant. It shall have self-leveling characteristics. The surface the epoxy will be bonding to shall be free of debris, moisture and anything else which might interfere with the bonding process. The epoxy shall be approved by the manufacturer of the detection system. Epoxy is an incidental item to be included in installation of SENSORS.

1.2.10 Software

- Each SENSOR, access point contact closure, RADIO RECEIVER and REPEATER/ANTENNA shall be capable of accepting software and firmware upgrades. The Wireless Battery-Powered Magnetometer Vehicle Detection System shall provide software operating on conventional notebook/portable PCs or utilize a standard web browser program to support configuration of a SENSOR, to support configuration of an access point, to support configuration of a REPEATER, to store and retrieve detection data.

1.2.11 Certification

- The Contractor SHALL FURNISH, the design details and drawings prior to installation in sufficient detail for complete evaluation and comparison with these Specifications.

1.2.12 Warranty

- Performance shall be warranted for a period of 60 months of the date of purchase and shall include repair or replacement of any component of the Wireless Vehicle Detection System. Failure due to workmanship, materials, and manufacturing defects shall be warranted for repair or replacement of the first 60 months of the date of purchase. The vendor shall replace any failed components within 30 calendar days of notification.
During the warranty period, technical support shall be available from the supplier via telephone within 2 business days of the time a call is made by a user, where this support shall be provided by factory-authorized personnel or factory-authorized installers. During the warranty period, standard updates to the software shall be available from the supplier without charge.

### 1.3 Construction
- Install wireless detection system in accordance with manufacturer’s instructions.
- Install wireless detectors using coring and fill hole with epoxy to obtain flush mounted installation
- Install overhead receivers/repeaters to ensure proper communications with detectors
- Coordinate with manufacturer or their representative to ensure proper system installation

### 1.4 Measurement
Pay Item 677049C, 677049D, 677049E, and 677049F includes furnishing and installing all necessary hardware, software, mounting hardware, equipment, cables, and components required to obtain detection zones complying with this specification and as shown on the plans or listed in the special provisions. Such payment shall be full compensation for installing all equipment, labor, and incidentals necessary to complete the work as specified. The other pay items listed below are specifically for furnishing and installing that item, and include any necessary mounting hardware, cable and other incidental items necessary for installation of that item.

### 1.5 Payment

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Unit</th>
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<tbody>
<tr>
<td>677049C</td>
<td>FURNISH WIRELESS DETECTION SYSTEM W/O SENSORS (INC SETBACK DETECTION CAPABILITY FOR 2 DIRECTIONS)</td>
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<tr>
<td>677049D</td>
<td>FURNISH WIRELESS DETECTION SYSTEM W/O SENSORS (INC SETBACK DETECTION CAPABILITY FOR 3 DIRECTIONS)</td>
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<tr>
<td>677049E</td>
<td>FURNISH WIRELESS DETECTION SYSTEM W/O SENSORS (INC SETBACK DETECTION CAPABILITY FOR 4 DIRECTIONS)</td>
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<tr>
<td>677049F</td>
<td>FURNISH WIRELESS DETECTION SYSTEM W/O SENSORS (w/o SETBACK DETECTION CAPABILITY)</td>
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<tr>
<td>677049G</td>
<td>FURNISH MANUFACTURER TECHNICIAN ASSISTANCE</td>
<td>HR</td>
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<tr>
<td>6770494</td>
<td>FURNISH &amp; INSTALL FLUSH MOUNTED WIRELESS SENSOR INC EPOXY</td>
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<tr>
<td>6887961</td>
<td>INSTALL FLUSH MOUNTED WIRELESS SENSOR</td>
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<tr>
<td>6887962</td>
<td>REMOVE FLUSH MOUNTED WIRELESS SENSOR</td>
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</tr>
<tr>
<td>6887963</td>
<td>INSTALL SET BACK LOOP EQUIPMENT</td>
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</tr>
<tr>
<td>6887964</td>
<td>INSTALL CABINET EQUIPMENT</td>
<td>EA</td>
</tr>
</tbody>
</table>
Supplemental Technical Specification for

Electric Service

SCDOT Designation: 680.1

1.1 Description
This work shall consist of furnishing and installing an Electric Service to provide electric power to traffic signals, at locations shown on the Plans, and in accordance with the Standard Drawings and Power Company procedures.

1.2 Materials
- All materials shall be NEC compliant.
- Meter, Meter Box (Pan type), Hub Access.
- Power Connection – Single-phase, 120/240 Volt, 3-Wire, 60-Hertz alternating current supply.
- Cable - 3-Wire (W, BL, RD), THHN/THWN, No.6 AWG
- Disconnect Switch - NEMA Standard Type 3R, weatherproof, Circuit Breaker Type, with a tab for pad-locking the cover closed, 3-Wire Design (2-circuit), with solid neutral. The panel shall be completely enclosed; there shall be no gaps in the panel with the door shut.

1.3 Construction
1.3.1 General
- The requirements detailed in this specification cover any other pay item not listed in Payment but pertaining to Electric Service.
- Perform all work in accordance with the Plans, the Standard Drawings and the REQUIREMENTS OF THE LOCAL POWER COMPANY. All work shall be in accordance with the National Electric Code (NEC), and applicable local Codes.
- Coordinate with the ENGINEER and the Power Company Representative as necessary to arrange the schedule for power connection.
- The Engineer will provide contact information for the Power Company.
- Make all necessary arrangements with the Power Company to insure having the needed power available at the TIME OF SIGNAL TURN-ON. Immediately report any difficulties in securing the service of the Power Company to the Engineer.
- Coordinate with the Engineer and the Power Company to determine the exact location of the electric service. The Electric Service is generally located as indicated below:
  a) Overhead service drop to controller pole;
  b) Overhead service drop to service pole, then underground to controller cabinet (isolated);
  c) Underground Power Company feed, to service on the back of controller cabinet.
- The CONTRACTOR shall obtain all ELECTRIC PERMITS required; and shall arrange for INSPECTION at completion.
- Use 1-inch diameter SCHEDULE 80 PVC Conduit and Fittings or Rigid Metallic Conduit for the Electric Service; install it to extend from the point of Power Company attachment, through the meter and disconnect assembly, to the controller cabinet, in accordance with 675.1 ELECTRICAL CONDUIT.
- Install a weather head to the above conduit for overhead service connections. Install a strain Clevis, to create a 1 feet minimum drip loop.
- Use rustproof hardware; use stainless steel or galvanized steel parts; use STAINLESS STEEL BANDS for attachment to steel poles.
- Space the bands a maximum of 3 feet and at the top and bottom of the pole.
- When specifically required by the Utility Company or on wood poles, substitute Conduit Clamps/strap, fastened with galvanized screws, for the bands.

1.3.2 Meter
- Provide a Meter for the electric service, unless otherwise directed by the Engineer. Provide the necessary hardware accordingly.
• The CONTRACTOR shall furnish and install the METER BOX (PAN), and the HUB.
• Provide power connection that is a SINGLE-PHASE, 120/240 VOLT, 3-WIRE, 60-Hertz alternating current supply.

**Disconnect Switch**
• Provide disconnect switch that is NEMA STANDARD TYPE 3R, weatherproof. It shall be CIRCUIT BREAKER TYPE, and have a tab for pad-locking the cover closed. It shall be of 3-WIRE DESIGN (2-circuit), with solid neutral.
• The CONTRACTOR shall twist a No. 6 AWG wire through the padlock tab, to prevent unauthorized entry and until SCDOT installs a padlock.

**1.3.3 Electric Service**
• Provide electrical service with components having the ratings stated in the following table, to provide a maximum of future flexibility and a minimum of voltage-drop to the lamps:

<table>
<thead>
<tr>
<th>ITEM</th>
<th>USAGE</th>
<th>Flashing Beacons</th>
<th>Traffic Signal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disconnect Breaker</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Box Rating (for uniformity):</td>
<td>60 AMP</td>
<td>60 AMP</td>
<td></td>
</tr>
<tr>
<td>Circuit Breaker (one side):</td>
<td>20 AMP</td>
<td>50 AMP</td>
<td></td>
</tr>
<tr>
<td>Cable</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3-Wire (W, BL, RD), THHN/THWN</td>
<td>No.6 AWG</td>
<td>No.6 AWG</td>
<td></td>
</tr>
<tr>
<td>Conduit</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Schedule 80 PVC (Wood Poles)</td>
<td>1 inch</td>
<td>1 inch</td>
<td></td>
</tr>
<tr>
<td>Rigid metallic (galvanized or aluminum) for steel or concrete poles</td>
<td>1 inch</td>
<td>1 inch</td>
<td></td>
</tr>
</tbody>
</table>

• Install Electrical Service Cable (Type THHN/THWN, sized per above table, 3-WIRE, (White, Black, red) 600 Volt, Copper only, stranded, with cable lugs) from the point of Power Company attachment to the Meter. From the meter to the cabinet install white, (black or red) and green. Install Electrical Service Cable in separate conduit from all other Electric Cable that connects to signal heads, pedestrian head or detection. At no place shall the service cable be in the same conduit as signal cables or loop lead-ins.

**1.3.4 Ground System**
• Ensure the resistivity of the electrical system EARTH GROUND shall be 15 OHMS OR LESS, as measured with an appropriate instrument which was calibrated not more than 60 days prior to the date of performing such tests.
• Ensure the poles, ground rods, ground wires, span wires, etc. forming the traffic signal, form a “GROUNDING ELECTRODE SYSTEM” as defined by Article 250 of the NATIONAL ELECTRIC CODE.
• Provide a 16 mm by 5/8 inch by 8 feet (minimum) ground rod, copper-clad, with brass or bronze ground rod clamp. EXOTHERMICALLY WELD the service ground rod; Connect all other ground rods with clamps.
• Provide grounding wire for the service that is No. 6 AWG, Bare, solid or stranded copper wire Exothermically Welded. (Note that this is in addition to the solid grounding wire running down each wooden pole.)

**1.4 Measurement**
• Complete Electrical Service shall be measured by EACH service installed in place, as shown on the Plans. It shall include all necessary conduit (trenched and/or riser), cable, conduit fittings, hardware, ground rod, banding, clamps, lugs, and all other materials and equipment specified or directed by the ENGINEER or Power Company. (Usually, there shall be no additional measurement of electrical cable used; there shall be no additional measurement of conduit used.) When an “Isolated electric service” is required by the Plans, an item and quantity will have been provided for wooden pole, as required.
### 1.5 Payment

<table>
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<th>Description</th>
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<tbody>
<tr>
<td>6800499</td>
<td>FURNISH &amp; INSTALL ELECTRICAL SERVICE FOR TRAFFIC SIGNAL</td>
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</tr>
<tr>
<td>6800500</td>
<td>MODIFY EXISTING ELECTRICAL SERVICE FOR TRAFFIC SIGNAL</td>
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</table>
Supplemental Technical Specification for

Splice Box / Junction Box

SCDOT Designation: 680.2

1.1 Description

This work shall consist of furnishing and installing a Splice Box or Junction Box at the locations shown on the Plans in accordance with these specifications and Standard Drawings 675-130-01, 675-130-03.

1.2 Materials

Acceptable materials can be found on the current SCDOT Qualified Products List http://info.scdot.org/Construction_D/sitePages/qualifiedProducts3.aspx.

1.3 Construction

1.3.1 General

• The requirements detailed in this specification cover any other pay item not listed in Payment but pertaining to Electrical Conduit.
• Provide a Splice Box including a Box and Cover, installed over aggregate, in accordance with the Standard Drawings.
• Install the Splice Box for use as a signal cable electrical enclosure.
• Install the Junction Box, where indicated on plans, for use as a loop detector “junction point”. Unless shown mounted on a pole, install the junction box in the dirt, at the depth of the conduit run, and covered with earth.

1.3.2 Splice Box

• Construct the Splice Box in accordance with the Standard Drawings, at locations shown on the Plans.
• Construct the Splice Box such that when the Box and Cover are in place, they are flush with the adjacent pavement, ground, or sidewalk, as shown in the Standard Drawings.
• Place patching Concrete around any Box installed in pavement.
• Place boxes at least 1 foot behind the curb-line or edge of roadway or as shown on the plans.

1.3.3 Placed Before Pouring.

• Where shown on the Plans, place Custom Splice Boxes in roadways or structures, prior to pouring the concrete. Typical usage would be in a bridge deck. Firmly attach the incoming conduit to the bottom reinforcement bar mat, or to the bottom wire-mat, using plastic tie-wraps every 2 feet. CAUTION: COMPLETELY PLUG/ BLOCK/ SEAL THE BOTTOM OF THE SPLICE BOX AND THE CONDUIT ENDS TO PREVENT CONCRETE PENETRATION. When used on a bridge, install the Splice Boxes near the center line, and terminate the conduit in Splice Boxes at each end.

1.3.4 Conduit

• Install conduit (in accordance with 675.1 ELECTRICAL CONDUIT) to enter the Box at the bottom and to extend at least 2 inches beyond the inside wall.
• Install conduit to enter from the direction of the run unless otherwise permitted by the ENGINEER.
• Ensure all metallic conduit ends within the Box have grounding bushings with plastic inserts; and ensure they are bonded using #6 AWG bare copper ground wire. Provide end bushings to prevent chaffing in plastic conduits.
• After placing the electrical cable, pack the completed conduit ends with “duct-seal” or other equivalent material to prevent water from entering the conduit. Insert steel wool at conduit ends to prevent rodent/pest intrusion. Cap spare conduit.

1.4 Measurement

• Furnishing and installing Splice Boxes will be measured by EACH Box placed complete, including Box, Cover, aggregate, patching concrete, ground wire, ground bushings, sealing, and all miscellaneous hardware and incidentals required.
• Furnishing and installing Junction Boxes will be measured incidental to the conduit to which it is used with.
<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>6800518</td>
<td>FURNISH &amp; INSTALL 13&quot;X24&quot;X18&quot;D.ELEC.FLUSH UNDGRD.ENCLOSURE-(STR.POLY.CONC.) HD</td>
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<td>680052C</td>
<td>FURNISH &amp; INSTALL 17&quot;X30&quot;X24&quot;D.ELEC.FLUSH UNDGRD.ENCLOSURE-(STR.POLY.CONC.) HD</td>
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<td>6800508</td>
<td>FURNISH &amp; INSTALL 12&quot;X12&quot;X12&quot;D.ELEC.FLUSH UNDGRD.ENCLOSURE-(STR.POLY.CONC.) HD</td>
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<td>6888100</td>
<td>INSTALL ELECTRICAL FLUSH UNDERGROUND ENCLOSURE</td>
<td>EA</td>
</tr>
</tbody>
</table>
Supplemental Technical Specification for

Wood Pole / Back Guy Assembly

SCDOT Designation: 682.1

1.1 Description
This work shall consist of furnishing and installing CCA treated Wood Poles and Back-Guy cable assemblies, of the types and sizes shown on the Plans, in accordance with these Specifications, and in close conformity with the lines shown on the Plans and in accordance with the Standard Drawings, 675-115-01, 675-115-02. Each wood pole installation shall include all related overhead and underground hardware, and back guy assemblies as provided elsewhere.

1.2 Materials

Furnish a wood pole meeting the following requirements:
- Southern Yellow Pine that is cut, stored, seasoned, and manufactured in accordance with specification ANSI 05, 1-19-79.
- Prohibited defects include:
  - Red heart
  - Excessive knots
  - Shakes in the tops of poles
  - Scars deeper than 1 inch or longer than 3 feet
  - Short crooks
  - Excessive butt-swell
  - Double-sweep
  - More than one twist per pole length
  - Splits or through-checks
  - Sweep in two planes
  - Nails or spikes
- All poles shall be straight to the extent that a line drawn from the center of the butt end, to the center of the tip end shall lie within the middle two-thirds of the body of the pole at all points.
- Poles shall also be free from short crooks, in which the surface deviation from straightness in any 5 feet of length exceeds 1.5 inches at any location, as determined by a straight edge.
- Each pole shall be prepared and pressure-treated in accordance with American Wood Preservers Association (AWPA) Standards C1, C3, C4, and M1. Treatment shall be "SALT TREATED", CCA-CHROMATED COPPER ARSENATE, and shall conform to AWPA Standard P5. The retention of the treatment shall be tested in accordance with AWPA Standard M2. The retention shall be at least 0.60 POUNDS PER CUBIC FOOT, as determined by AWPA Standards.
- Provide Class II pole in the length specified in pay item.
- Each pole shall have a "brand" 12 feet above the butt-end, showing the Manufacturer, Plant-location with month and year of treatment, "Southern Pine CCA", and the Pole Class and Length. A Metal Tag showing Pole Length and Class shall be fixed to the butt-end; and the Length and Class shall be stamped on the top-end.
- Each pole shall have the "Brand Mark" of an inspection-company that has been approved by the Department.

Furnish Back-Guy Assembly as follows:
- From the top-down, a Back-Guy Assembly shall consist of: eye-type thru-bolt, guy-hook, strandvise (or 3-bolt clamp), jumper-bonding clamp, the steel cable (3/8-inch guy-cable stranded), another strandvise (or 3-bolt clamp), and a Screw-type guy anchor.
• All parts shall be as shown on the Installation Details or the Standards. All hardware shall be hot-dip galvanized in accordance with ASTM Standard A-153 to ensure rust proof.
• Acceptable parts are:
  a) Guy Anchors - One piece screw type guy-anchors, shall conform to EEI-TD-2, 1 inch diameter, 8- FEET LONG, thimble eye type. (Joslyn No. J-6550-WCA or approved equal)
  b) Guy Guards shall conform to REA Item "AT" yellow plastic (PVC) sunlight resistant, 8 feet long.
  c) Spool Insulators shall conform to REA Item "CM".
  d) Insulators shall conform to REA Item "W".
  e) Machine Bolts shall conform to REA Item "C".
  f) `J' hooks - Reliable No. 5552 (or approved equal).
  g) Guy and Messenger Cable Dead Ends - Reliable Universal Strandvise (or approved equal)
  h) Thimbleye Bolts shall conform to EEI-TD-4.
  i) Thimble Nuts shall conform to EEI-TDJ-5.
  j) Washers shall conform to EEI-TDJ-10.
  k) Angle Thimbleye shall conform to REA Item 5.
  l) Cable- 3/8 INCH DIAMETER CABLE (682.3 STEEL CABLE)
  m) Cable Clamps: 3-bolt clamps shall conform to EEI-TDJ-23, (4 inch and 6 inch sizes)
  n) Clevises shall conform to EEI-TD-20.
  o) Side-walk Bridge-over shall be a stress supporting spreader-type, bolting to the wood pole.

1.3 Construction

1.3.1 General
• The requirements detailed in this specification cover any other pay item not listed in Payment but pertaining to Wood Poles and/or Back-Guy Assemblies.

1.3.2 Utility Poles
• Install poles used for joint-use UTILITIES, in accordance with all local codes, and with the requirements of the Utility Company. Provide Cross Arms if required by the Utility Company.

1.3.3 Location
• Install the pole in the general location shown on the Plans.
• Coordinate with the Engineer to stake the field location of the pole, considering the property lines, underground utilities, and overhead clearances (including the guy anchor assembly).
• Engineer will approve staked locations, however contractor is responsible for locating utilities.
• If utility conflicts are discovered, relocate pole in coordination with the Engineer’s approval.
• The pole location may have to be moved based on unmarked utilities.

1.3.4 Hole
• Drill a 6-foot DEEP hole, unless indicated otherwise in standard drawings.
• The diameter of the hole shall be larger than the pole by approximately 4 inches all around.
• Ensure the hole is a uniform diameter, and cleanly augured.

1.3.5 Installation
• Install poles to be vertical; if poles are corner signal poles, RAKE the pole away from the strain, 2 to 4 inches per 10 feet length.
• Install back guy assembly in line with the strain of each span wire.
• After installing, back-fill the hole with clean earth or sand (no rocks or debris), placed in 1 foot layers; moisten and compact each layer.
• Remove excess earth from the site; A 2-inch mound around the pole base is acceptable.

1.3.6 Sidewalk
• When installing the pole in a sidewalk, cleanly cut out the sidewalk 6 inches larger than the pole on all sides.
• Install conduit runs in the cut.
• Install as indicated in 1.3.5 Installation, leaving 4 inches for concrete placement.
• Install expansion joint material around the pole and tack in place, after installation of the pole and back filling the hole.
• Pour concrete around the pole to a depth of 4 inches; neatly troweled level. This work is incidental to pole installation.
1.3.7 Grounding

- Ground each pole in accordance with the Standard Drawings.
- Install a No. 6 AWG, SOLID, bare-copper ground wire (ASTM B2) to run the entire length of wooden poles, and extend 6 inches above the top end.
- Securely attach and bond the ground wire to the pole while it is lying on the ground.
- Ensure the ground wire extends 6 inches above the top end with a 2-foot coil (slack) at the top end, and extends down to the bottom with another 2-foot coil on the bottom end.
- Attach the ground wire (and the coils) using galvanized 1-1/2 inch wire staples, on (2 foot) centers above 14 feet, and on 1 foot centers below 14 feet. (The spacing change will be at 8 feet above grade.)
- Provide Ground Rods that are copper-clad, conforming to EEI-TDJ-30, having a minimum size of 5/8 inch by 8 feet in length.
- Use a ground rod clamp that is heavy-duty bronze or brass.
- Provide a GROUND ROD on one wood pole at each intersection, typically on the pole having the electrical service from the Power Company.
- Drive the ground rod vertically into the earth, until it extends about 2 inches above local grade.
- Use a separate No. 6 AWG bare, STRANDED/SOLID copper wire to bond the electrical service and the overhead cable (and pole ground wire) system to the ground rod, using a grounding clamp.

1.3.8 Back-Guy Assembly

- Back Guy each wood pole used to support signal span wires.
- Install Back-Guy Assemblies on wood poles used to support messenger cables especially at turns, and as directed by the ENGINEER.
- Install sufficient numbers of back-guy assemblies to ensure the stability of wood pole installations. This may include:
  - Double-guying
  - Extra-large anchors
  - Re-guying Utility Company poles.
- Install a Back-Guy Assembly:
  - a) Where shown on the plans;
  - b) In conjunction with installation of Steel Cable as span wire;
  - c) In conjunction with the installation of a wooden pole;
  - d) Where required by the Utility Company to "dress" pole to which signal equipment is attached; or,
  - e) At corner/turning wood poles that are used for messenger cable runs.
- A separate pay item is provided for Back Guy installation
- Inform the ENGINEER when additional back guy assemblies are required.
- Ensure the number and size of Back-Guy assemblies is fully sufficient to anchor every wood signal pole, corner messenger cable pole, and Utility Company pole (where required).
- Stage the installation of the wood pole, Back-Guy Assembly, and the span wire, for the safety of the motorist, pedestrian, and signal construction worker.
- Stretch, adjust, and then RE-ADJUST the span wire and Back-Guy Assembly to produce the specified amount of span wire sag, the proper signal head road-clearance, and still create a nearly vertical wood pole.
- Ensure the Back-Guy Assembly is sufficiently strong to handle the pull of all span wires, considering the earth/soil type into which the ground anchor is buried. Provide EXTRA LARGE ANCHORS and/or MULTIPLE-ANCHOR ASSEMBLIES if needed. Use special anchors for solid rock.
- Where a pedestrian sidewalk is adjacent to a wood pole, furnish a sidewalk "bridge-over" assembly.
- Ensure the compass angle of the Back-Guy is reasonably IN LINE with the strain of the overhead cable: that is, in line with each span wire. For corner signal wood poles, install two (2) Back-Guys, installed at right angles to each other. Using a single diagonal Back-Guy is generally unacceptable, unless approved by the ENGINEER.
- Install the Back-Guy (wherever possible) to provide as a minimum: rise=2 / run=1 (i.e. 2/1). For example, if the Back-Guy is attached at 26 feet, the anchor should be at a minimum of 13 feet from the pole. This corresponds to an angle with the earth of about 60 degrees.
- Perform all work within the public Right of Way, and take particular to assure that the Back-Guy does not extend into private property.
- Install the Back-Guy where it will not interfere with traffic, giving particular attention to private driveways. Where damage is likely (e.g. edge of driveway) install a STEEL GUY GUARD to protect the cable. When shown on the Plans, place a CONCRETE TIRE/WHEEL STOP (curb) at the base of the Back-Guy, anchored/pinned with 2 feet pieces of reinforcement bar.
• Do not splice the steel cable used in the Back-Guy assembly.

1.3.9 **Inspection**

• The ENGINEER will inspect each installation of wood pole, span wire, signal heads, and Back-Guy, for proper clearance, dress, and tension. At the direction of the ENGINEER, the CONTRACTOR shall re-install or replace improper installations, without further compensation.

1.3.10 **Acceptance**

• Acceptance of each wood pole shall include checking for the pressure-treatment inspection company Brand Mark, plus visual inspection by the ENGINEER.

• The visual inspection shall be made of the pole, overhead cables, grounding, and back guy assembly.

• The complete installation shall be structurally sound, and the final pole placement shall be vertical, or raked as specified.

• Contractor shall replace any poles NOT meeting this inspection, without further cost to the project.

1.4 **Measurement**

• Furnishing and installing wood poles, will be measured by EACH, of the Size specified, erected in place as shown on the Plans, including grounding, and all miscellaneous hardware and related work activity as required.

• Furnishing and installing Back-Guy Assemblies, will be measured by EACH, erected in place in accordance with the Specifications and as shown on the Plans, including all miscellaneous hardware as required.

• Additional Back-Guy Assemblies that are installed for reason of situations or conditions that arise during construction, will be paid, and shall be measured by EACH.

1.5 **Payment**

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<tr>
<th>Wood Pole</th>
<th>Description</th>
<th>Unit</th>
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<tbody>
<tr>
<td>6825020</td>
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<tr>
<th>Back-Guy Assembly</th>
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<td>FURNISH &amp; INSTALL 3/8&quot; BACK GUY FOR WOOD POLE</td>
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<td>6825046</td>
<td>FURNISH &amp; INSTALL 3/8&quot; SIDEWALK GUY</td>
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<tr>
<td>6825047</td>
<td>FURNISH &amp; INSTALL 3/8&quot; AERIAL GUY</td>
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</tbody>
</table>
Supplemental Technical Specification for

Steel Cable

SCDOT Designation: 682.3

1.1 Description

This work shall consist of furnishing and installing splice-free lengths of Steel Cable with cable supports, for mounting signal heads, signs, interconnect runs at locations shown on the Plans and in accordance with the Standard Drawings.

1.2 Materials

Acceptable materials can be found on the current SCDOT Qualified Products List [link]

1.3 Construction

1.3.1 General

• The requirements detailed in this specification cover any other pay item not listed in Payment but pertaining to Steel Cable.

1.3.2 Span Wire

• Install all Span Wire as shown on the plans and in accordance with the Standard Drawings. Note that different methods and materials are required for Wood Poles and Steel Poles.

• Before erecting the Span Wire, the Contractor shall determine the length of cable required to span the distance indicated on the Plans. Allow sufficient additional length to compensate for sag, pole connections, and adjustments, to make the whole assembly consistent with the plans and the Standard Drawings. NO MID-SPAN SPLICES SHALL BE PERMITTED.

• Set the Span Wire so that the height of the installed signal heads, including all hardware, shall conform to the clearances shown on the Standard Drawings.

• Do not permanently "tied-off" the Span Wire until all signal heads, signs, and cables are in place.

• Do not erect any Span Wire which lays on, or is likely to rub a Utility Company's cable. Protect any Span Wire erected within 6 inches of any other cable, wire, or structure with plastic wire guards.

• When required by the Utility Company, or by the applicable electrical Code, install strain-type fiberglass insulators.

• Cables from STEEL POLES
  a) Steel Poles are essentially electrical conductors.
  b) Use a Roller Type Pole Clamp attached at the proper height.
  c) Secure the free-end of the cable with a 6 inch galvanized steel clamp, with 5/8 inch galvanized bolts. Place the clamp approximately 1 foot from the pole. Cable-grips are not permitted.
  d) Cover the ends of the cable with "servisleeves" to prevent unraveling.
  e) The SAG shall be 3%, TO 5%, fully loaded.

• Cables from WOODEN POLES
  a) Wooden poles are essentially electrical insulators, and thus require extensive GROUNDING and BONDING procedures, in accordance with the Standard Drawings.
  b) The SAG shall be typically 5%, fully loaded.
  c) The height of attachment shall be sufficient to provide the required road-clearance, including sag.
  d) Shall be installed in accordance with the requirements of the Utility Company.
  e) May require the installation of a back guy assembly as required in 682.1 WOOD POLE/BACK GUY ASSEMBLY.
  f) Shall be electrically bonded.

1.3.3 Messenger Wire

• Where Messenger Wire is attached to traffic signal poles, install it in the same manner as specified for span wire, but with relatively little sag.

• Where Messenger Wire is attached to utility poles, install in accordance with the UTILITY COMPANY'S SPECIFICATIONS.
1.3.4 **Tether Wire**
- Where Steel Cable is specified to tether signal heads and/or traffic signs, install it in accordance with the Standard Drawings. Galvanized S-hooks should be used at the pole ends to permit "break-away" action.

1.3.5 **Cable Supports**
- Use Cable Supports to support electrical cables from span wire and messenger wire. Place Cable Supports at 10 INCH INTERVALS.
- When Aluminum Tie-Wraps are used, install by wrapping 3-full turns TIGHTLY around the bundle formed by the steel cable and all electrical cables then cutting off from the tape coil.

1.4 **Measurement**
- Measure Steel Cable of the SIZE specified by the LINEAR FEET of material as actually placed, which shall include cable supports, clamps, insulators, and all other miscellaneous hardware and fittings. (or other sizes as shown on the plans), and such payment shall be full compensation for furnishing and placing the cable, support rings, clamps, S-hooks, turnbuckles, and other incidentals required to complete the work as specified.

1.5 **Payment**

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<thead>
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<th>Description</th>
<th>Unit</th>
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<tr>
<td>6825092</td>
<td>FURNISH AND INSTALL 3/8&quot; GALVANIZED STEEL CABLE (Span Wire)</td>
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<tr>
<td>6825090</td>
<td>FURNISH AND INSTALL 1/4&quot; GALVANIZED STEEL CABLE (Messenger Wire)</td>
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</tbody>
</table>
Supplemental Technical Specification for

Pedestrian Pole and Base

SCDOT Designation: 682.4

1.1 Description
This work shall consist of furnishing and installing a Pedestrian Pedestal Pole and Base in accordance with these Specifications and the Standard Drawings (675-105-02, 675-105-03).

1.2 Materials

1.3 Construction

1.3.1 General
• The requirements detailed in this specification cover any other pay item not listed in Payment but pertaining to Pedestrian Pole and Base.
• Install Pedestrian Pedestal Poles where shown on the Plans and as needed to accommodate pedestrian movements.
• Mount Pedestrian Pedestal Poles so that no portion of the assembly (including the pedestrian head) is closer than 24” inches to the face of the curb.
• Powder-coating may be required if pay item is provided or if specified in the special provisions or on the signal plans. Perform the powder-coating over the aluminum poles at the factory or during the manufacturing process.

1.3.2 Installation
• Construct the foundation to the dimensions shown on Standard Drawings.
• Capp two 1- inch conduit elbows at both ends and secured in place in the excavation before pouring any concrete. The size and number of elbows shall be that necessary to mate with the incoming runs.
• Ensure all conduit elbows shall extend beyond the side of the finished foundation by approximately twelve inches, in the direction of, and at a depth matching the incoming conduit.
• Set 4 Anchor Bolts using pre-formed templates (wood or metal), to provide a "bolt-circle" in accordance with the Dimension Chart, or with recommendations of the base manufacturer. Leave the templates in place for two days (48 hours) or until the forms are removed.
• Mix, place and test concrete in accordance with applicable portions of SCDOT STANDARD SPECIFICATIONS Sections 701, 702, 703, and 704.
• Fasten the pedestrian pole base to the concrete foundation using appropriate hardware.
• Erect and tightly screw the aluminum pole into the base.
• Tighten the setscrew to prevent counter rotation of the aluminum pole.

1.4 Measurement
• Furnishing and installing pay items include pedestrian pedestal pole, base, and foundation installation by EACH including all required incidental hardware and work to install.

1.5 Payment

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<tr>
<td>6825480</td>
<td>FURNISH &amp; INSTALL 4' BREAK-AWAY ALUMINUM PEDESTAL POLE AND BASE</td>
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<td>6825482</td>
<td>FURNISH &amp; INSTALL 8' BREAK-AWAY ALUMINUM PEDESTAL POLE AND BASE</td>
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<td>6825484</td>
<td>FURNISH AND INSTALL 10' BREAK-AWAY ALUMINUM PEDESTAL POLE AND BASE</td>
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Powder-coating Option:

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<tbody>
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<td>6888192</td>
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<td>6888193</td>
<td>POWDERCOATING OPTION FOR 8' ALUMINUM PEDESTAL POLE</td>
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<td>6888194</td>
<td>POWDERCOATING OPTION FOR 10' ALUMINUM PEDESTAL POLE</td>
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<tr>
<td>Foundation Only:</td>
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<tr>
<td>Only for use where pedestrian pole and base is provided by others.</td>
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<tr>
<td>6825486</td>
<td>INSTALL CONCRETE FOUNDATION FOR ALUMINUM PEDESTAL POLE</td>
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</tbody>
</table>
Supplemental Technical Specification for

Signal Heads

SCDOT Designation: 686.1

1.1 Description

This work shall consist of furnishing and installing Signal Heads, LED Modules or Backplates of the types, sizes, and mounting specified, in accordance with these Specifications, the plans and in accordance with the Standard Drawings (675-105-01, 675-105-02).

1.2 Materials

Acceptable materials can be found on the current SCDOT Qualified Products List http://info.scdot.org/Construction_D/sitePages/qualifiedProducts3.aspx.

1.3 Construction

1.3.1 General

• The requirements detailed in this specification cover any other pay item not listed in Payment but pertaining to Signal Heads.
• The Contractor shall furnish the ENGINEER with any warranties on materials provided by the Manufacturer or Vendor as normal trade practice, including a minimum 5-year warranty for the LED modules.
• In addition, the Contractor shall provide a EIGHTEEN (18) MONTHS workmanship warranty following the FINAL ACCEPTANCE. If any signal head fails by reason of defective material or workmanship, including cracking, falling, peeling or fading, the Contractor shall furnish and install replacement signal heads at no expense to the Department.
• Signal LED modules shall have the incandescent look. Pixelated LED modules shall be supplied as replacement modules only as directed by the ENGINEER.
• The red section in the five section head shall be powder coated.
• Provide fully assembled Signal Heads with LED Modules and the appropriate mounting hardware.
• Install Signal Heads where shown on the plans and positioned in accordance with the Standard Drawings.
• Ensure the top section of all vehicle signal heads mounted on the same pole or pedestal is within 6 inches of being the same height unless otherwise specified.
• Install all multi-section/combination signal heads with their top sections at the same elevation as other signal heads.

1.3.2 Wiring

• Connect electrical cable to the terminals in each signal head to provide the proper display indication.
• Do not externally splice the cable.
• Run electrical cable in accordance with the Standard Drawings.

1.3.3 Mounting

• Provide mounting hardware that is from one manufacturer. The DEPARTMENT will not accept mix-matched mounting assembly parts.
• Tighten mounting assembly to manufacturer standards prior to installing.
• If overhead adjustments are required for aiming, contractor shall field tighten using spanner wrench; Contractor shall ensure that signal heads are securely mounted on span wire or mast arms.
• Mount all traffic signal heads as shown on the plans and in accordance with the Standard Drawings.
• Aim signal faces to ensure good visibility, and to the satisfaction of the ENGINEER.
### 1.3.4 Signal Backplate
- Fasten Signal Backplates using appropriate hardware recommended by the signal head manufacturer.
- Provide a Signal Backplate that matches signal head without cutting, bending, or breaking. Drilling holes to match screw patterns is acceptable.
- Provide a Signal Backplate in accordance with Standard Drawing.

### 1.4 Measurement
- The pay items for furnish and install Signal Heads will be measured using the EACH unit and includes furnishing and installing Signal Heads with LED modules as specified on the plans and including ALL mounting hardware, internal electrical connections and ALL required incidental hardware.

### 1.5 Payment

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<tr>
<td>6865710</td>
<td>Furnish and Install 12” 5 Section Signal Head</td>
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<td>6865720</td>
<td>Furnish and Install 12” 4 Section Signal Head</td>
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<td>6865723</td>
<td>Furnish and Install 12” 3 Section Signal Head</td>
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<td>6865834</td>
<td>FURNISH &amp; INSTALL BACKPLATE W/ RETROREFL.BORDERS FOR TRAFFIC SIGNAL</td>
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Supplemental Technical Specification for

Pedestrian Signal Head

SCDOT Designation: 686.3

1.1 Description

This work shall consist of furnishing and installing Pedestrian Signal Heads, Pedestrian LED Modules of the types, sizes, and mounting specified, in accordance with these Specifications, the plans and in accordance with the Standard Drawings. (675-105-02, 675-105-03, 675-110-00).

1.2 Materials

Acceptable materials can be found on the current SCDOT Qualified Products List http://info.scdot.org/Construction_D/sitePages/qualifiedProducts3.aspx.

1.3 Construction

1.3.1 General

- The requirements detailed in this specification cover any other pay item not listed in Payment but pertaining to Pedestrian Signal Heads.
- The Contractor shall furnish the ENGINEER with any warranties on materials provided by the Manufacturer or Vendor as normal trade practice, including a minimum 5-year warranty for the LED modules.
- In addition, the Contractor shall provide a EIGHTEEN (18) MONTHS workmanship warranty following the FINAL ACCEPTANCE. If any pedestrian signal head fails by reason of defective material or workmanship, including cracking, falling, peeling or fading, the Contractor shall furnish and install replacement pedestrian signal heads at no expense to the Department.
- Pedestrian Signal LED modules shall have the incandescent look. Supply pixelated LED modules as replacement modules only as directed by the ENGINEER.
- The pedestrian head and the mounting hardware are stated as one item.
- Install pedestrian signal heads where shown on the Plans or as needed to accommodate pedestrian movements.
- If multiple Pedestrian Signal Heads are required on the same pole or pedestal, mount within 6 INCHES of being the same height unless otherwise specified on the Plans.
- Mount Pedestrian Signal Heads so that no portion of the assembly is closer than 24 INCHES to the face of the curb.
- Mount Pedestrian Signal Heads to provide a clearance of 9 to 10 feet from the surface grade.

1.3.2 Wiring

- Connect electrical cable to the terminals in each Pedestrian Signal Head to provide the proper display indication when energized by the signal controller.
- Do not externally splice the cable.
- Run electrical cable in accordance with the Standard Drawings.

1.3.3 Mounting

- Use non-corrosive material in all hardware.
- Use FEDERAL YELLOW painted brackets, arms, and other hardware, unless noted otherwise in the plans or special provisions.
- Mount all pedestrian signal heads as shown on the Plans and Standard Drawings.
- See Standard Drawings for mounting information on Clamshell Mount, Side of Pole Mount, Single Post Top Mount, and Dual Post Top Mount.
1.4 Measurement

- The pay items for furnish and install Pedestrian Signal Heads will be measured using the EACH unit and includes furnishing and installing Pedestrian Signal Heads with LED modules as specified on the plans and including ALL mounting hardware, internal electrical connections and ALL required incidental hardware.
- There are separate pay items for furnishing and installing Pedestrian LED modules in existing pedestrian signal heads using the EACH unit.

1.5 Payment

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<td>6865783</td>
<td>FURNISH &amp; INSTALL COUNTDOWN PEDESTRIAN SIGNAL HEAD</td>
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</table>
Supplemental Technical Specification for
Pedestrian Push Button Station Assembly with Sign
SCDOT Designation: 686.4

1.1 Description
This work shall consist of furnishing and installing a PEDESTRIAN PUSH BUTTON STATION ASSEMBLY AND PUSH BUTTON SIGN, of the types, sizes, and mountings specified in accordance with these Specifications, at locations shown on the Plans and in accordance with the Standard Drawings.

1.2 Materials
Acceptable materials can be found on the current SCDOT Qualified Products List http://info.scdot.org/Construction_D/sitePages/qualifiedProducts3.aspx.

1.3 Construction
1.3.1 General
• The requirements detailed in this specification cover any other pay item not listed in Payment but pertaining to Pedestrian Push Button Assembly.
• The Contractor shall furnish the ENGINEER with any warranties on materials that are provided by the Manufacturer or Vendor as normal trade practice.
• Install Push Button Station Assemblies where shown on the Plans, or as necessary to accommodate pedestrian movements.

1.3.2 Installation
• Install Push Button Station Assemblies on poles in a height of 3-1/2 to 4 feet ABOVE GRADE.
• Orient and wire the Push Button Station Assembly in such a manner to clearly indicate to the pedestrian, the crosswalk with which it is associated.
• Attach Push Button Station Assemblies to poles using 1 inch stainless steel bands or galvanized screwed directly to pole.
• If dual push button station assemblies are required, a single dual mounting bracket shall be used to allow for two push button station assemblies to be mounted with the buttons positioned below the sign.
• Firmly secure the finished assembly to the pole.
• Connect each Push Button Station Assembly with the appropriate electrical cable, and wire to actuate the proper phase of the controller. The necessary cable is specified as a separate item, in accordance with 677.1 ELECTRICAL CABLE.
• Do not splice the cable. On metal poles, bring the cable for the push buttons through the rear of the assembly directly into the pole or controller cabinet. On wooden poles, use electrical conduit to bring the cable to the assembly.

1.3.3 Push Button Signs
• Install each push button sign on the station assembly to reflect the proper intention of the pedestrian movement.

1.4 Measurement
• The pay items for furnish and install Push Button Station Assembly with Sign will be measured using the EACH unit and includes furnishing and installing the Push Button, Push Button Assembly and Sign as specified on the plans and including ALL mounting hardware, internal electrical connections and ALL required incidental hardware.

1.5 Payment
<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
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<tr>
<td>6865793</td>
<td>FURNISH &amp; INSTALL PEDESTRIAN PUSH BUTTON MICROSWITCH TYPE STATION ASSEMBLY (9&quot;x12&quot;) AND SIGN (R-10-3E)</td>
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<td>FURNISH &amp; INSTALL PEDESTRIAN PUSH BUTTON MICROSWITCH TYPE</td>
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<td>6865796</td>
<td>FURNISH &amp; INSTALL PEDESTRIAN PUSH BUTTON SOLID STATE WITH LIGHT AND TONE STATION ASSEMBLY (9&quot;x12&quot;) AND SIGN (R-10-3E)</td>
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<td>FURNISH &amp; INSTALL PEDESTRIAN PUSH BUTTON SOLID STATE WITH LIGHT AND TONE</td>
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Supplemental Technical Specification for

LED Blankout Sign

SCDOT Designation: 686.5

1.1 Description
This work shall consist of furnishing and installing a LED Blankout Sign of Clam-Shell configuration, with Sun Visor and designated mounting hardware. of the types, sizes, and mounting specified, in accordance with these Specifications, the plans and in accordance with the Standard Drawings.

1.2 Materials
Acceptable materials can be found on the current SCDOT Qualified Products List [http://info.scdot.org/Construction_D/sitePages/qualifiedProducts3.aspx].

1.3 Construction

1.3.1 General
- The requirements detailed in this specification cover any other pay item not listed in Payment but pertaining to LED Blankout Sign.
- The Contractor shall furnish the ENGINEER with any warranties on materials that are provided by the Manufacturer or Vendor as normal trade practice.
- The Blankout Sign and the mounting hardware are stated as one item.
- Install the Blankout Signs where shown on the Plans, positioned according to the Standard Drawings.
- Hang Blankout Sign to ensure good visibility, to the satisfaction of the Engineer.

1.3.2 Wiring
- Connect electrical cable to the terminals in each Blankout sign to provide the proper display indication.
- Do not externally splice the cable.
- Run electrical cable in accordance with the Standard Drawings.
- Electrical cable shall be splice-free lengths of, NO. 14 COPPER WIRE, 4 CONDUCTOR, BLACK, see 677.1 Electric Cable

1.3.3 Mounting
- Use hardware that is non-corrosive material, or chemically compatible with the item being used.
- Use adjustable signal brackets to rigidly mount Blankout Signs.
- Use brackets and suspensions that are painted Federal YELLOW unless directed otherwise by the Engineer (Except mast arm mounts).
- Mount all Blankout Signs as shown on the Standards Drawings.

1.4 Measurement
- The pay items for furnish and install Blankout Signs will be measured using the EACH unit and includes furnishing and installing Blankout Sign housing, with appropriate LED module as specified on the plans and including ALL mounting hardware, internal electrical connections and ALL required incidental hardware.
- There are separate pay items for furnishing and installing Blankout LED modules in existing Blankout sign housing using the EACH unit and includes weather tight neoprene gasket and any other hardware or material necessary to complete installation.

1.5 Payment

<table>
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<tr>
<td>6865820</td>
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<td>6865821</td>
<td>FURNISH &amp; INSTALL NO RIGHT/LEFT TURN SYMBOLIC LED MODULE</td>
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</tbody>
</table>
Supplemental Technical Specification for

Removal Salvage and Disposal of Equipment and Materials

SCDOT Designation: 688.1

1.1 Description
This work consists of the removal and salvage or removal and disposal of equipment, materials or refuse that are not designated or permitted to remain. The engineer will instruct the contractor of what equipment or materials will be salvaged and where the contractor should deliver salvaged equipment/materials. The engineer will instruct the contractor of what equipment, materials and refuse to be disposed of. Contractor will dispose of these items in a manner that complies with all state and federal regulations governing disposal.

1.2 Materials
n/a

1.3 Construction
1.3.1 General
• The requirements detailed in this specification cover any other pay item not listed in Payment but pertaining to Removal, Salvage and Disposal of Equipment and Materials.
• Carefully remove the items to be salvaged from the job site and return to the Department. The Contractor shall deliver, and obtain a RECEIPT for, the salvaged equipment, to one of the SCDOT District Signal Shops or one of the Local Government Signal Shops (see link)
• Remove equipment or material to be Disposed and properly dispose at an APPROVED LAND FILL (or material reclamation yard). Any materials designated as HAZARDOUS WASTE shall be disposed in accordance with regulations enforced by the SC Department of Health and Environmental Control (DHEC).
• Any equipment or material to be Disposed shall not be re-sold by contractor as anything other than scrap material.
• Fill every hole caused by removing old equipment on THE SAME DAY. Back-fill, compact, and reseed/sod, to the satisfaction of the ENGINEER. Cleanly side-trim holes in PAVEMENT then bring to grade and finish with the same paving material as the adjacent pavement. Completely replace sidewalk "squares" (complete square), using forms and expansion material.
• Underground conduit and detector loops not utilized, shall be abandoned in place.
• FINAL ACCEPTANCE and Final Payment will be withheld, if the Contractor has not removed unneeded equipment from the job site, and if the Contractor cannot present RECEIPTS from SCDOT or Local Government showing that the salvaged equipment has been delivered to SCDOT.

1.3.2 Items that are generally Removed and Disposed of:
1.3.2.1 Concrete foundations
• Remove the foundations of ground-mounted cabinets completely. The Engineer may direct the contractor to clear the foundation to a minimum depth of 18 inches below surface grade.
• Remove the foundations of signal support poles completely. The Engineer may direct the contractor to clear the foundation to a minimum depth of 18 inches below surface grade.

1.3.1 Damaged Equipment
• Remove and Dispose any signal equipment/material that is deemed by the Engineer as damaged beyond salvaging.

1.3.2 Miscellaneous Equipment
• Remove minor equipment from the site and dispose.
• This includes steel cable, electrical cable, conduit, concrete pads, back guys and pullboxes / handboxes not utilized in the new signalization.
1.3.3 Items that are determined whether to Salvage or Disposed of in the field by the Engineer

1.3.3.1 Wood Poles
- Remove Wood Poles that are not utilized in the new signalization and are not required by other utilities.
- The ENGINEER shall make the determination whether each wooden pole shall be salvaged or disposed.
- If wood pole is to be salvaged, tag it with information concerning what location it was removed from.

Items that are generally Removed and Salvaged

1.3.3.2 Cabinet Assembly
- Prior to removal, clearly tag every cabinet, controller, conflict monitor, and any other major cabinet equipment item with the intersection name from which it is being removed. (Fiber interconnect center, video detection cabinet equipment, Ethernet switch, fiber modem, radio cabinet equipment)
- Record serial numbers for each cabinet, controller, and conflict monitor serial numbers and transmit to the Department.

1.3.3.3 Signal Heads
- Prior to removal, clearly tag each signal head with the intersection name from which it is being removed.
- Carefully dismounted signal heads keeping as much of the mounting hardware intact as possible.
- During the removal and delivery, take special care to prevent damage to the lenses and visors.

1.3.3.4 Pedestrian Equipment
- Prior to removal, clearly tag each pedestrian head, pedestrian pole and pedestrian button assembly with the intersection name from which it is being removed.
- Carefully dismount pedestrian heads and button assemblies keeping as much of the mounting hardware intact as possible.
- Ensure removal of pedestal pole includes related hardware (nuts, base).
- During the removal and delivery, take special care to prevent damage to the lenses and visors.

1.3.3.5 Metal Poles
- Prior to removal, clearly tag each steel strain pole with the intersection name from which it is being removed.
- Ensure removal of strain poles includes their related hardware (pole caps, bolt covers, hand hole covers, nuts, transformer bases, etc.).
- Bag related hardware and attach to steel strain pole and pedestrian pole to ensure materials remain together.

1.3.3.6 Splice Boxes
- Prior to removal, clearly tag each splice box with the intersection name from which it is being removed.

1.3.3.7 Signs
- Remove and salvage highway signs on existing span wires after the replacement signs have been installed.

1.4 Measurement

This item shall be paid as a lump sum per contract or as an each, which relates to remove, salvage, disposal items per signal. The lump sum pay item includes all signals named in the contract. Costs relating to transportation, disposal, pavement and grading repairs should be included in pay item. The cost for removing foundations for steel strain poles is either provided as lump sum (which is all removals needed per contract) or each, which is all removals needed per steel strain pole foundation removal. The related costs of transportation, disposal, concrete, pavement repair, etc., will not be measured for payment, but shall be included in the bid price of Removal, Salvage, and Disposal.
## 1.5 Payment

<table>
<thead>
<tr>
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<th>Description</th>
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<tr>
<td>6885990</td>
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<td>6885991</td>
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<td>6885982</td>
<td>REMOVE FOUNDATION OF STEEL STRAIN POLE - 18&quot; BELOW GRADE</td>
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<td>6887941</td>
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Supplemental Technical Specification for

Video Detection System

SCDOT Designation: 688.3

1.1 Description
This work consists of furnishing and installing video detection systems with all necessary hardware and software in accordance with the plans and Standard Drawings.

1.2 Materials
Acceptable materials can be found on the current SCDOT Qualified Products List http://info.scdot.org/Construction_D/sitePages/qualifiedProducts3.aspx.

1.3 Construction
1.3.1 General
- The requirements detailed in this specification cover any other pay item not listed in Payment but pertaining to Video Detection System.
- The Contractor shall furnish the ENGINEER with any warranties on materials that are provided by the Manufacturer or Vendor as normal trade practice.
- Arrange and conduct site surveys with SCDOT personnel to determine proper camera sensor unit selection and placement.
- Provide SCDOT at least 3 working days notice before conducting site surveys.
- Upon completion of the site surveys, provide SCDOT with revised plans reflecting the findings of the site survey.
- As determined during the site survey, install sensor junction boxes with nominal 6 x 10 x 6 inches dimensions at each sensor location. Provide terminal blocks and tie points for power cable.
- Place into operation loop emulator detection systems. Configure loop emulator detection systems to achieve required detection in designated zones. Have a certified manufacturer’s representative on site to supervise and assist with installation, set up, and testing of the system.
- Perform modifications to camera sensor unit for gain, sensitivity, and iris limits necessary to complete the installation.
- Do not install camera sensor units on signal poles unless approved by the ENGINEER.
- Install a power cable appropriately sized to meet the power requirements of the sensors. At a minimum, provide three conductor 120 VAC field power cable.
- Install the necessary cables from each sensor to the signal controller cabinet along signal cabling routes.
- Install surge protection where coaxial video cables and other cables are required between the camera sensor and other components located in the controller cabinet. Terminate all cable conductors.
- Relocate camera sensor units and reconfigure detection zones as necessary according to the plans for construction phases.

1.4 Measurement
- Furnishing and Install Video Detection System shall be measured as EACH unit and shall include one camera, the cabinet equipment, and all mounting hardware and necessary cable to connect camera to cabinet equipment.
- Furnish and Install Add’l Camera with Hardware & Lead In shall be measured as EACH unit and includes furnishing and installing 1 camera and all mounting hardware and necessary cables to connect to cabinet equipment.

1.5 Payment

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<td>6886039</td>
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<td>6886041</td>
<td>INSTALL VIDEO DETECTION SYSTEM</td>
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<tr>
<td>6886042</td>
<td>FURNISH &amp; INSTALL VIDEO DETECTION CAMERA W/ HARDWARE &amp; LEAD-IN</td>
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Supplemental Technical Specification for
Steel Strain Pole and Foundation
SCDOT Designation: 688.5

1.1 Description
This work shall consist of furnishing and installing Steel Strain Poles for traffic signal supports at the locations shown on the Plans and in accordance with the Standard Drawings, with anchor bolts and all miscellaneous hardware. This work shall also consist of installing a foundation for the steel strain pole in accordance with the Standard Drawings.

1.2 Materials
Acceptable materials can be found on the current SCDOT Qualified Products List http://info.scdot.org/Construction_D/sitePages/qualifiedProducts3.aspx.

1.3 Construction

1.3.1 General
• The requirements detailed in this specification cover any other pay item not listed in Payment but pertaining to Steel Strain Pole.
• The Contractor shall furnish the ENGINEER with any warranties on materials that are provided by the Manufacturer or Vendor as normal trade practice.
• Repair galvanized surfaces (poles) which have been scratched or abraded so that bare metal is exposed, by applying 2 coats of 90% (minimum) Zinc-rich, cold-galvanizing compound; to the satisfaction of the ENGINEER.

1.3.2 Location
• Install the pole in the general location shown on the Plans.
• Coordinate with the Engineer to stake the field location of the pole, considering the property lines, underground utilities, and overhead clearances.
• ENGINEER will approve staked locations, however contractor is responsible for locating utilities.
• If utility conflicts are discovered, relocate pole in coordination with the Engineer’s approval.
• The pole location may have to be moved based on unmarked utilities.

1.3.3 Foundation
• Drill a hole, as indicated in the Standard Drawings.
• The hole shall be augured (earth-auger), and the concrete poured in UN-disturbed earth.
• Ensure the hole is a uniform diameter, and cleanly augured.
• If foundation cannot be constructed to meet Standard Drawings, provide an alternative foundation design signed and sealed by a SC PE.
• It may be necessary to use a jack-hammer in BED-ROCK; it may be necessary to use a heavy walled CAISSON to line the hole and to pump it dry in high water table areas or areas where springs are encountered. These materials, tools and additional labor are incidental to the project.
• Where shown on the Plans, or as determined by the location of underground utilities, it may be necessary to excavate a hole BY HAND. NO additional payment shall be made UNLESS an item has been established in the BID or Proposal for UNCLASSIFIED EXCAVATION (hand excavation of hole) - CUBIC YARDS.
• Construct the foundation as shown in Standard Drawing 675-115-02 including the rebar cage and conduit.
• Mix, place, pour and test the concrete in accordance with SCDOT Standard Specifications, Sections 701, 702, 703, and 704.
• Provide CLASS 5000 for the foundation. Place the concrete in one continuous pour with vibration.
• Set the Anchor Bolts using pre-formed templates (wood or metal), to provide a "bolt-circle" in accordance with the Standard Drawings or with recommendations of the pole Manufacturer. Leave the templates in place for 2 days (48 hours).
• Capp conduit elbows at both ends, and secure in place in the excavated hole before pouring any concrete.
• Each foundation shall have a minimum of 1-3", 3-2" and 2-1" conduits placed in accordance with the Standard Drawings. Provide additional conduits if shown on the plans. These conduits are incidental to the work.
• Terminate all conduit provided in foundation in a 13"X24"X18"splice box; the splice box shall be installed in accordance with 680.2 Splice Boxes / Junction Boxes. The splice box shall be paid separately.
• Ensure all conduit elbows extend beyond the side of the finished foundation by a minimum of 12 inches, in the direction of, and at a depth matching the incoming conduit. Where a conduit elbow is placed for future use, scribe an "X" in the foundation to indicate the side where such conduit enters. Ensure the conduit protrudes a minimum of 6 inches above the top of the finished concrete foundation.

1.3.4 Grounding
• Furnish and install ground rods and grounding wire with each foundation.
• Configure the ground rod with the foundation, as shown on the Standard Drawings.
• Use grounding clamps of brass or bronze to secure the grounding wire to the ground rod.
• Use a continuous ground wire to bond all metal parts together--pole ground stud; pedestal pole nut; pole-mounted controller cabinet ground; metal conduits; etc.

1.3.5 Installation
• Do not place the steel pole on the foundation for a minimum of 2 days (48 hours after individual pour)
• Do not place strain on the steel pole for a minimum of 7 days (168 hours after individual pour) or as otherwise directed by the ENGINEER.
• Rake each pole away from the line of span wire pull, by adjusting the nuts on the Anchor Bolts.
• When final load is applied, ensure there is a 6 inch (plus or minus one inch) rake at the top of the pole, opposing the direction of the stress.
• Restore the site to prime condition after the pole installation, back filling the area surrounding the pole with topsoil, raking it level and seeding. If the area is sloped, then use landscape turf.

1.3.6 Sidewalk/Island Installation
• When installing the pole in a sidewalk, cleanly cut out the entire “square” of the sidewalk and install the foundation as indicated above.
• Replace the sidewalk using expansion joint material to separate different "pours" and old/new concrete. This work is incidental, unless an item has been established for CONCRETE PATCH or for SIDEWALK.
• In concrete islands, saw-cut out a square opening 4 feet x 4 feet for the pole base and repair as stated above.
• When installed in SIDEWALKS or CONCRETE ISLANDS, contour the entire area and hand-finish to produce a neat visual line. Sharp edges or pedestrian hazards shall not be allowed.

1.3.7 Acceptance
• Acceptance of each pole shall include foundation strength testing plus visual inspection by the ENGINEER.
• The visual inspection shall be made of the pole, overhead cables, and grounding.
• The complete installation shall be structurally sound, and the final pole placement shall be vertical, or raked as specified.
• Contractor shall replace any poles NOT meeting this inspection, without further cost to the project.

1.4 Measurement
• Furnishing and installing 13" Diameter Steel Strain Poles and Foundations, will be measured by EACH, of the size(s) specified, and erected in place as shown on the plans. This shall include foundation, anchor bolts, nut covers, pole cap, reinforcing steel, ground rod, ground wire, and all miscellaneous hardware as required.
• Installing Concrete Foundation for Steel Strain Pole, will be measured by each, shall include reinforcing steel, ground rod, ground wire, and all miscellaneous hardware as required.

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<td>682505A</td>
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<tr>
<td>6825050</td>
<td>FURNISH &amp; INSTALL 26' STEEL STRAIN POLE (POWDER COATED) AND FOUNDATION</td>
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<td>FURNISH &amp; INSTALL 28' STEEL STRAIN POLE AND FOUNDATION</td>
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<td>FURNISH &amp; INSTALL 28' STEEL STRAIN POLE (POWDER COATED) AND FOUNDATION</td>
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Supplemental Technical Specification for
Concrete Strain Pole
SCDOT Designation: 688.6

1.1 Description
This work shall consist of furnishing and installing pre-stressed Concrete Strain Poles for traffic signal supports at the locations shown on the Plans and in accordance with the Standard Drawings, with all miscellaneous hardware. These poles shall be of the type intended for direct embedding, with the hole back filled with concrete.

1.2 Materials
Acceptable materials can be found on the current SCDOT Qualified Products List http://info.scdot.org/Construction_D/sitePages/qualifiedProducts3.aspx.

1.3 Construction
1.3.1 General
- The requirements detailed in this specification cover any other pay item not listed in Payment but pertaining to Concrete Strain Pole.
- The Contractor shall furnish the ENGINEER with any warranties on materials that are provided by the Manufacturer or Vendor as normal trade practice.
- Patch any concrete surfaces which have been chipped, chunked or damaged to the satisfaction of the ENGINEER with a commercial grade vinyl or epoxy based on concrete patching compound, according to manufacturer's instructions.
- CAUTION – Concrete poles are very heavy, quite long and are difficult to handle. Perform transportation, site handling and erection with acceptable equipment and methods and by qualified personnel. The Contractor is cautioned to have cranes, pole trailers and sufficient manpower to perform this work with total safety to the crew and to the motoring public. The Contractor shall review the manufacturer’s shop drawings to identify proper pick-up points for lifting.

1.3.2 Location
- Install the pole in the general location shown on the Plans.
- Coordinate with the Engineer to stake the field location of the pole, considering the property lines, underground utilities, and overhead clearances.
- ENGINEER will approve staked locations, however contractor is responsible for locating utilities.
- If utility conflicts are discovered, relocate pole in coordination with the Engineer’s approval.
- The pole location may have to be moved based on unmarked utilities.

1.3.3 Hole
- Augur the hole in undisturbed earth of the diameter and to the depth (at least) listed in the standard drawings or as recommended by the manufacturer (whichever is larger). Construct the embedding foundation as shown in Standard Drawing 675-115-02.
- Measure the depth and diameter of the hole with a tape measure to ensure it meets the required dimensions.
- If hole dimensions and backfill foundation cannot be constructed to meet Standard Drawings, provide an alternative foundation design signed and sealed by a SC PE.
- It may be necessary to use a jack-hammer in BED-ROCK; it may be necessary to use a heavy walled CAISSON to line the hole and to pump it dry in high water table areas or areas where springs are encountered. In Wet-lands or loose-sand, it may also be necessary to auger a larger hole. These materials, tools and additional labor are incidental to the project.
- Where shown on the Plans, or as determined by the location of underground utilities, it may be necessary to excavate a hole BY HAND. NO additional payment shall be made UNLESS an item has been established in the BID or Proposal for UNCLASSIFIED EXCAVATION (hand excavation of hole) - CUBIC YARDS.
In bed-rock, a hole shall be jackhammered out and be of sufficient depth to hold the design embedded length and a diameter to provide 3 inch clearance all around the concrete pole.

1.3.4 **Grounding**
- Furnish and install ground rods and grounding wire with each concrete pole.
- Drive the ground rod adjacent to the poured concrete embedding as shown on the Standard Drawing.
- Use grounding clamps of brass or bronze to secure the grounding wire to the ground rod.
- Use a continuous ground wire to bond all metal parts together--pole ground stud; pedestal pole nut; pole-mounted controller cabinet ground; metal conduits; etc.

1.3.5 **Installation**
- Place the concrete pole in the hole.
- Lift the pole into place, using a sling. A single point lift shall NEVER be used and such misuse could result in the ENGINEER rejecting that pole.
- Next, to lower the pole into the hole, insert a bar into the chocker hole (1/3 down the pole) (to prevent the strap from slipping) and use a single strap to raise one end of the pole vertically and jostle the butt end into the hole.
- Lower the pole into the hole and hold vertically by the crane.
- Using a pry bar through the “CANT” hole, rotate the pole so that all holes are at the proper compass orientation angle with the street and incoming conduit runs.
- Rake each pole slightly away (leaned away) from the direction of the span wire pull. For a concrete pole this will typically mean that the back side of the pole is vertically plumb.
- Backfill the hole back with concrete while supporting the concrete pole vertically with a pole or boom truck until the poured embedding concrete begins to set. This will typically be 15 to 20 minutes.
- Mix, place, pour and test the concrete in accordance with SCDOT Standard Specifications, Sections 701, 702, 703, and 704.
- Provide CLASS 3000 for the foundation: Place the concrete in one continuous pour.
- Plug/cover the underground cable entrance hole and any conduit openings to prevent concrete intrusion.
- After installation, the Contractor shall plug or cap all unused openings and couplings on the concrete pole using a threaded plug or a cemented PVC cap.
- Capp at both ends and secure in place any conduit elbows in the excavation before pouring any concrete.
- Each foundation shall have a minimum of 1-3”, 3-2” and 2-1” conduits placed in accordance with the Standard Drawings. Provide additional conduits if shown on the plans. These conduits are incidental to the work.
- Terminate all conduit provided in foundation in a 13"X24"X18”splice box; the splice box shall be installed in accordance with 680.2 Splice Boxes / Junction Boxes. The splice box shall be paid separately.
- Ensure all conduit elbows shall extend beyond the side of the finished foundation by a minimum of 12 inches in the direction of and at a depth matching the incoming conduit.
- Do not place stress (steel cables) on the pole until the poured embedding concrete has hardened (typically 72 hours).
- Restore the site to prime condition after the pole installation, back filling the area surrounding the pole with topsoil, raking it level and seeding. If the area is sloped, then use landscape turf.

1.3.6 **Sidewalk/Island Installation**
- When installing the pole in a sidewalk, cleanly cut out the entire “square” of the sidewalk and install the concrete pole embedded in poured concrete; back fill with tamped dirt to 4 inches below the ground line foundation as indicated above.
- Replace the sidewalk using expansion joint material to separate different "pours" and old/new concrete. This work is incidental, unless an item has been established for CONCRETE PATCH or for SIDEWALK.
- In concrete islands, saw-cut out a square opening 4 feet x 4 feet for the pole base and repair as stated above.
- When installed in SIDEWALKS or CONCRETE ISLANDS, contour the entire area and hand-finish to produce a neat visual line. Sharp edges or pedestrian hazards shall not be allowed.
1.3.7 **Acceptance**

- Acceptance of each pole shall include foundation strength testing plus visual inspection by the ENGINEER.
- The visual inspection shall be made of the pole, overhead cables, and grounding.
- The complete installation shall be structurally sound, and the final pole placement shall be vertical, or raked as specified.
- Contractor shall replace any poles NOT meeting this inspection, without further cost to the project.

1.4 **Measurement**

- Furnishing and installing concrete strain poles will be measured by EACH of the length specified. This shall include pole cap and all miscellaneous hardware as required.
- Conduit elbows shall be considered to be incidental to the installation of the concrete pole.

1.5 **Payment**

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<tr>
<th>Code</th>
<th>Description</th>
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<tr>
<td>6825061</td>
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<td>FURNISH &amp; INSTALL 40' CONCRETE STRAIN POLE</td>
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<td>6825064</td>
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Supplemental Technical Specification for
Controller and Cabinet Assembly
SCDOT Designation: 688.7

1.1 Description
This work shall consist of furnishing and installing Cabinet Assembly, Cabinet Foundation and Controller in accordance with these Specifications, at the locations shown on the Plans, and in accordance with the Standard Drawings. This item shall include all electrical accessories and other items specified.

1.2 Materials

1.3 Construction

1.3.1 General
- The requirements detailed in this specification cover any other pay item not listed in Payment but pertaining to Controller and Cabinet Assembly.
- The Contractor shall furnish the ENGINEER with any warranties on materials that are provided by the Manufacturer or Vendor as normal trade practice or to match warranty on existing state contract items.

1.3.2 Concrete Foundation
- Construct the foundation to the dimensions shown on the Standard Drawing 675-130-02.
- Set bolt pattern in accordance with the recommendations of the Cabinet Manufacturer.
- Set templates for setting anchor bolts and leave in place until the forms are removed.
- Concrete lag bolts drilled into pad are allowed.
- Mix, place and test concrete in accordance with applicable portions of SCDOT STANDARD SPECIFICATIONS Sections 701, 702, 703, and 704. Provide CLASS 3000 concrete.
- Set base mounted cabinets on a bead of silicone caulk.

1.3.3 Ground Rod and Ground Wire
- Furnish and install a ground rod and ground wire with each Cabinet.
- Place the 5/8 INCH by 8 feet (minimum) Copper-clad ground rods near the cabinet’s concrete foundation, external to the cabinet pad in a splice box. If additional ground rods are required, place nearby and EXOTHERMICALLY WELD together.
- Place a 1-INCH PVC conduit and elbow in foundation prior to pouring as shown in the Standard Drawing.
- Run ground wires (No. 6 AWG bare, stranded copper wire) continuously from the ground rod to the Controller Cabinet (chassis ground on the AC ground bar) through this conduit; and run ground wires continuously from the ground rod to the foundation anchor bolts, to the conduit bends, etc.
- EXOTHERMICALLY WELD ground wires TO THE GROUND ROD.
- Use grounding bushings on metal conduit.
- For Cabinets mounted on strain poles, connect the grounding stud on the pole.
- The entire ground rod shall be driven below the grade or place in a junction box.

1.3.4 Conduit Elbows
- Do not encase the conduit entering the cabinet in concrete. (See Standard Drawings)
- Set Conduit Elbows in the footing excavation before the concrete is poured.
- The size and number of elbows shall be that necessary to mate with the incoming runs and in accordance with the plans and the Standard Drawings. Run conduit in accordance with Standard Drawing 675-130-02 from pole to splice box and from pole to cabinet where the steel pole is adjacent to a base mounted cabinet.
- Conduit shall extend beyond the side of the finished foundation by a minimum of 12 inches, in the direction of, and at a depth matching the incoming conduit.
- The conduit shall extend beyond the top of the finished foundation into the pole or Cabinet, in accordance with Standard Drawings.
- Cover and protect the open-ends and threads on the conduit bends during construction activities.

1.3.5 **Electrical Wiring**
- Install all required equipment in the Cabinet, and neatly wire with tied or wrapped harnesses. Force-fitted or mutually interfering equipment is not acceptable.
- Label cable harnesses and terminals legibly.
- Terminate all bare wires in a "spade-lug" prior to connection to a terminal strip. ‘Crimp-on’ the "spade-lug" using a ratchet-type crimping tool.
- Tie wires not facilitating equipment movement to the back or side-panel.
- Install and position equipment for easy access.
- Ensure opening and closing the Cabinet door shall not chaff the wiring.
- Ensure the field (lamp) wiring shall have 3 feet of slack cable in each cabinet.
- Coil the slack and tie neatly in the bottom of the Cabinet.
- Separate signal cables from detector lead-in cables as much as possible, to reduce interference.

1.4 **Measurement**
- Local Controller and Cabinet furnished and/or installed will be measured by EACH TYPE Controller and Cabinet (mounting specified); and erected in place as shown on the Plans including miscellaneous electronics, load switches, wiring, electrical connection, ground rod, ground wire, and all related hardware. This includes a concrete cabinet foundation, anchor bolts and all necessary hardware.
- Furnishing and/or Installing a Concrete Cabinet Foundation will be measured by EACH and will include anchor bolts and all necessary hardware.

1.5 **Payment**

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<td>INSTALL CONTROLLER AND 336 CABINET - POLE MOUNTED</td>
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<td>6888225</td>
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Supplemental Technical Specification for

Flasher Cabinet Assembly

SCDOT Designation: 688.8

1.1 Description
This work shall consist of furnishing and installing Splice/Flasher Cabinet as indicated on the plans and in accordance with these Specifications and the Standard Drawings.

1.2 Materials
Acceptable materials for Flasher Cabinet Assembly includes an aluminum flasher box, complete with mounting brackets, police lock and key, minimum dimensions of 14” x 14” x 11”. Flasher Cabinet Assembly shall have terminal lugs included. Flasher Cabinet Assembly shall be Pre-wired for Time Switch and include a back panel pre-wired for
- 8 position terminal block
- 10 amp circuit breaker
- SPA-100T lightning surrestor
- Toggle switch for a variety of operation times
- 30 amp isolation relay
- NEMA flasher.

1.3 Construction
1.3.1 General
- The requirements detailed in this specification cover any other pay item not listed in Payment but pertaining to Flasher Cabinet.
- The Contractor shall furnish the ENGINEER with any warranties on materials that are provided by the Manufacturer or Vendor as normal trade practice or to match warranty on existing state contract items.
- Provide all components or hardware made of corrosion-resistant material, or be of the same materials as the item being installed.
- Provide a cabinet designed for pole or pedestal-pole mounting. It shall be furnished with all related corrosion resistant hardware, including top and bottom mounting brackets, or pole-hub. Straps used shall be stainless steel.
- Install a Flasher Cabinet Assembly to operate overhead or shoulder mounted flashers that are powered with electricity.

1.3.2 Mounting/ Foundation
Mount the Cabinet as shown in the Standards Drawings.

1.3.3 Grounding
- GROUNDING AND SURGE/LIGHTNING PROTECTION SHALL BE PROVIDED in every Flasher Cabinet Assembly (unless specifically forbidden by the Manufacturer).
- The Protector shall be Telephone Company grade, and be conformable with the Terminal Block
- Ground the cable shield.
- Run a No. 6 AWG bare stranded copper Ground Wire continuously from the Cabinet to the ground rod at the pole base. Where design requires, drive a new ground rod; and install a ground wire from the Cabinet to the ground rod.

1.3.4 Electrical Wiring
- Connect electrical cables to the terminals in accordance with the signal equipment Manufacturer recommendations.

1.4 Measurement
- Furnishing and/or Installing Flasher Cabinet Assembly, shall be measured by EACH housing, erected and placed as shown on the Plans, including miscellaneous electronics, electrical connections, etc. NOTE:
The furnishing, installation, and payment of the conduit, poles, electrical service, and other major items are specified elsewhere.

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Supplemental Technical Specification for

Solar Powered Flasher Assembly

SCDOT Designation: 688.9

1.1 Description
This work shall consist of installing and/or furnishing a Solar Powered Flasher Assembly and performing all related wiring necessary, in accordance with these Specifications and the Standard Drawings.

1.2 Materials
Acceptable materials can be found on the current SCDOT Qualified Products List [http://info.scdot.org/Construction_D/sitePages/qualifiedProducts3.aspx].

1.3 Construction

1.3.1 General
- The requirements detailed in this specification cover any other pay item not listed in Payment but pertaining to Solar Powered Flasher Assembly.
- The Contractor shall furnish the ENGINEER with any warranties on materials provided by the Manufacturer or Vendor as normal trade practice, including a minimum 5-year warranty for the LED modules.
- The types of Solar Flasher Assembly is listed below:
  - 24/7 Single Solar 24 Hour Flashing Beacon
  - 24/7 Single Compact Solar 24 Hour Flashing Beacon
  - Dual 24 Hour Solar Powered Flashing Beacon
  - Dual Solar Powered School Flashing Beacon
  - Dual Compact Solar School Zone Flasher

1.3.2 Installation
- Install the entire assembly, including solar engine, signal housing and LED modules with all necessary hardware for mounting to one of the following pole types:
  - Pedestrian Pole
  - Side-of-pole arm
- If the sign is larger than 36 inches, install the assembly using two poles.
- Install Pedestrian Pole in accordance with 682.4 Pedestrian Pole and Base and the Standard Drawings.
- The entire assembly shall mount at one point. Separate mounting for the signal head or any other component shall not be required.

1.4 Measurement
Furnishing and Installing a Solar Powered Flasher Assembly, shall be measured by EACH, erected and placed as shown on the Plans, which shall include all electrical connections and all required incidental hardware and all necessary bases and foundations for poles.
Separate pay items for Pedestrian Poles are in accordance with 682.4 Pedestrian Pole and Base.

1.5 Payment

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Supplemental Technical Specification for

Steel Pole with Mast-Arm

SCDOT Designation: 690.1

1.1 Description
This work shall consist of designing (foundations, lengths of arms, size of support arms), furnishing and installing Steel Traffic Signal Poles with Mast-Arm(s). Concrete footings with reinforcing steel, anchor bolts, ground rods, conduit elbows, and miscellaneous hardware shall be designed and installed with each pole as required. Steel mast-arm poles, its components, adapter plates and foundations shall be stamped and sealed by a licensed South Carolina Professional Engineer.

1.2 Materials

1.3 Construction

1.3.1 General
• The requirements detailed in this specification cover any other pay item not listed in Payment but pertaining to Mast Arms.
• The CONTRACTOR shall furnish the Engineer with all warranties on equipment and material offered by the Manufacturer as normal trade practice.
• Repair poles, which have been scratched or abraded so that bare metal is exposed, to the satisfaction of the Engineer. Repair holes drilled in poles or Mast-Arms
• Use hardware or components made of a non-corrosive material, or be of the same material as the item being installed.
• Install signal head using rigid signal head mount brackets. The bracket shall consist of a top- and bottom-arm, an extruded aluminum vertical tube, a vertical tube clamp, and a mast-arm clamp, with all hardware. The Bracket shall be COMPLETELY RUST PROOF, and shall be fully adjustable in all dimensions and angles.
• Where required by the Plans, install signs using a rust proof mounting bracket.
• Powdercoating Color and type will be specified on the plans or in the Special Provisions.
• Decorative options will be specified on the plans or in the Special Provisions.
• Luminaire generally require a taller pole, per Standard Drawing or as noted in Special Provisions or Signal Plans.
• Luminaire to be furnished and/or installed must be provided by the same manufacturer as the mast arm, unless noted otherwise. Luminaire design and/or color should match mast arm design and/or color unless noted otherwise in Special Provisions or Plans.
• Luminaire are metered separately from traffic signal, unless noted otherwise on the plans or in the special provisions.

1.3.2 Location
• Install the pole in the general location shown on the Plans.
• Coordinate with the Engineer to stake the field location of the pole, considering the property lines, underground utilities, and overhead clearances.
• ENGINEER will approve staked locations, however contractor is responsible for locating utilities.
• If utility conflicts are discovered, relocate pole in coordination with the Engineer’s approval.
• The pole location may have to be moved based on unmarked utilities.
• The design of the mast arm is based on the location, length and soil type. Contractor shall not order mast arm poles until final pole location is determined free of utilities and is approved by the Engineer.
• Provide soil boring at each signal location to the satisfaction of the Engineer of Record designing the mast arm assembly and foundation. A minimum of one soil boring per signal to a 15’ depth is required.
1.3.3 **Foundation**
- Contractor to provide foundation design (see 1.3.9), including depth and diameter of foundation, reinforcing cage design, strength of concrete;
- Drill a hole, as indicated in the foundation design.
- The hole shall be augured (earth-auger), and the concrete poured in UN-disturbed earth.
- Ensure the hole is a uniform diameter, and cleanly augured.
- The foundation shall be constructed with a circular reinforcing cage (**either tied together, or tack welded**) installed, in accordance with foundation design.
- Steel reinforcement shall conform to the requirements of DOT STANDARD SPECIFICATIONS, Section 703.2.1. The bars shall be of the size and type shown on the foundation design.
- The finished square surface above ground shall be as shown on the Standard Drawings.
- It may be necessary to use a jack-hammer in BED-ROCK; it may be necessary to use a heavy walled CAISSON to line the hole and to pump it dry in high water table areas or areas where springs are encountered. These materials, tools and additional labor are incidental to the project.
- Where shown on the Plans, or as determined by the location of underground utilities, it may be necessary to excavate a hole BY HAND. NO additional payment shall be made UNLESS an item has been established in the BID or Proposal for UNCLASSIFIED EXCAVATION (hand excavation of hole) - CUBIC YARDS.
- Mix, place, pour and test the concrete in accordance with SCDOT Standard Specifications, Sections 701, 702, 703, and 704.
- Use design concrete strength, minimum of CLASS 5000 for the foundation. Place the concrete in one continuous pour with vibration.
- Set the Anchor Bolts using pre-formed templates (wood or metal), to provide a "bolt-circle" in accordance with the Standard Drawings or with recommendations of the pole Manufacturer. Leave the templates in place for 2 days (48 hours).
- Capp conduit elbows at both ends, and secure in place in the excavated hole before pouring any concrete.
- Each foundation shall have a minimum of 1-3”, 3-2” and 2-1” conduits placed in accordance with the Standard Drawings. Provide additional conduits if shown on the plans. These conduits are incidental to the work.
- Terminate all conduit provided in foundation in a 13"X24"X18" splice box; the splice box shall be installed in accordance with 680.2 Splice Boxes / Junction Boxes. The splice box shall be paid separately.
- Ensure all conduit elbows extend beyond the side of the finished foundation by a minimum of 12 inches, in the direction of, and at a depth matching the incoming conduit. Where a conduit elbow is placed for future use, scribe an "X" in the foundation to indicate the side where such conduit enters. Ensure the conduit protrudes a minimum of 6 inches above the top of the finished concrete foundation.

1.3.4 **Grounding**
- Furnish and install ground rods and grounding wire with each foundation.
- Configure the ground rod with the foundation, as shown on the Standard Drawings.
- Use grounding clamps of brass or bronze to secure the grounding wire to the ground rod.
- Use a continuous ground wire to bond all metal parts together--pole ground stud; pedestal pole nut; pole-mounted controller cabinet ground; metal conduits; etc.

1.3.5 **Anchor Bolts**
- Provide hooked anchor bolts at least 90 inches long with each steel pole with mast arms.
- Thread and hot dip galvanize the top 12 inches of the anchor bolt.
- Provide two hot dipped galvanized nuts and two washers per anchor bolt.

1.3.6 **Adapter Plate**
- Provide adapter plate with each mast arm that has a different anchor bolt pattern from SCDOT’s standard steel pole pattern.
- **Note:** Adapter plate(s), bolts, nuts, and washers not required if steel pole with mast arm is designed to be supported by current SCDOT signal foundation (concrete foundation with (4) 2” dia. anchor bolts on a 18-inch dia. bolt circle), and the design meets the design criteria requirements of this specification.
- With each steel pole with mast arms, provide a 2” thick, hot dipped galvanized steel adapter to allow a pole with a 19” square base plate and 18” dia. bolt circle to be installed. Plate shall be pre-drilled with
(4) 2 3/8” dia. bolt holes on the 18” dia. bolt circle. A 10” dia. minimum hole shall be provided in the center of the adapter plate.

- Provide (4) hot dipped galvanized 2” x 10” hex head cap screws, (12) nuts, and (8) washers in a BURLAP bag for each adapter plate. Bolts and nuts shall be of sufficient strength to support a 32-foot tall steel pole with steel strain wire supporting signal heads and signs for the intersection in case the steel pole with mast arms is damaged and has to be removed and replaced.
- Adapter plate(s), bolt, and nut selection and design shall be stamped and sealed by a licensed South Carolina Professional Engineer.
- Provide a BURLAP bag containing the adapter plate nuts, bolts, and washers inside each steel pole with mast arms.
- *Place the adapter plate, if required, between the leveling nuts and the steel pole with mast arms base.*

### 1.3.7 Installation

- Do not place the mast arm pole on the foundation for a minimum of 2 days (48 hours after individual pour)
- Do not place a load on the mast arm poles for a minimum of 7 days (168 hours after individual pour) or as otherwise directed by the ENGINEER.
- Each Pole shall be raked away from the line of the Mast-Arm pull, by adjusting the nuts on the anchor bolts.
- When final load is applied, there shall be an essentially vertical appearance as determined by the Engineer.
- Provide 22’ minimum vertical clearance between the bottom of the overhead traffic signal mast arm and the pavement and shoulders, unless otherwise shown on the plans.
- Restore the site to prime condition after the pole installation, back filling the area surrounding the pole with topsoil, raking it level and seeding. If the area is sloped, then use landscape turf.

### 1.3.8 Sidewalk/Island Installation

- When installing the pole in a sidewalk, cleanly cut out the entire “square” of the sidewalk and install the foundation as indicated above.
- Replace the sidewalk using expansion joint material to separate different "pours" and old/new concrete. This work is incidental, unless an item has been established for CONCRETE PATCH or for SIDEWALK.
- In concrete islands, saw-cut out a square opening 4 feet x 4 feet for the pole base and repair as stated above.
- When installed in SIDEWALKS or CONCRETE ISLANDS, contour the entire area and hand-finish to produce a neat visual line. Sharp edges or pedestrian hazards shall not be allowed.

### 1.3.9 Acceptance

- Acceptance of each pole shall include foundation strength testing plus visual inspection by the ENGINEER.
- The visual inspection shall be made of the pole, overhead cables, and grounding.
- The complete installation shall be structurally sound, and the final pole placement shall be vertical, or raked as specified.
- Contractor shall replace any poles NOT meeting this inspection, without further cost to the project.

### 1.3.10 Design Criteria

#### 1.3.10.1 AASHTO Standards

- Ensure the Mast-Arm traffic signal Pole is designed to meet the requirements of the "Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals"; American Association of State Highway And Transportation Officials (AASHTO), latest edition.
- Design all components of the Mast-Arm Pole assemblies to include and to address the following:
  - Mast Arm Length
  - Soil type
  - Design Life – minimum 25-year mean recurrence interval
  - Basic wind speed in accordance with AASHTO Wind Speed map (latest edition)
  - Ice loading
  - Fatigue category II (2)
  - Natural wind gust pressure loads
• Truck-induced gust pressure loads
• Mast arm loading as follows in 1.10.2.

1.3.10.2 Minimum Loading Assumptions
• For design, minimum loading assume there is a 4-section polycarbonate, rigidly mounted signal head with backplate centered per lane including auxiliary lanes, an 24" x 8' illuminated street name sign on each arm, and additional 24" x 36" signs adjacent to each signal head. See plans to determine if additional loading is required. Design mast arms for the most stringent loading.

1.3.10.3 Design And Drawings
• The CONTRACTOR SHALL FURNISH pole design details, calculations, and shop-drawings in sufficient detail for complete evaluation and comparison with these Specifications.
• Any exceptions to these Specifications must be stated in writing.
• The design, calculations, and shop drawings shall be stamped and sealed by a licensed South Carolina Professional Engineer.
• The CONTRACTOR SHALL FURNISH a concrete foundation design details and calculations adequate for local soil type and steel pole with mast arm loading.
• Mast arm loading shall be the greater of the Minimum Loading Assumptions or the loading shown on the Plans.
• The design and calculations shall be stamped and sealed by a licensed South Carolina Professional Engineer.
• Provide CATALOG CUTS ARE REQUIRED FOR REVIEW AND APPROVAL PRIOR TO FABRICATION.

1.3.10.4 Miscellaneous Items
Steel pole with mast arms design drawing shall include the following:
• 4" x 6" minimum reinforced handhole,
• \(\frac{1}{2}"\) coarse thread grounding stud located on interior of pole handhole,
• strain relief j-hook at top of pole, rain cap,
• holes in steel poles and mast arms for wiring to be routed to traffic signals,
• holes for wiring to be protected with full circumference grommets,
• nut covers to be provided to cover anchor bolt nuts,
• tapered poles and mast arms shall taper uniformly along their length
• additional requirements as shown on the signal plans for the intersections

1.4 Measurement
The following pay items will be measured by Each (EA) erected in place as shown on the plans:
• Design shall include all necessary services to completely design mast arm installation, including necessary geotechnical work, utility research, foundation design, mast arm upright and arm structural design and determining length of mast arms.
• Furnish includes delivery costs and all necessary components necessary to provide and install a fully functional mast arm, including all hardware Adapter Plates (if applicable), Anchor Bolts, Nut Covers, Pole Cap, reinforcing steel, ground rod, ground wire, and all miscellaneous hardware as required.
• Install pay items including foundation include all materials and work necessary to completely install mast arm structure, including rebar, concrete, conduit, and forms.
• Install pay item without foundation includes all work necessary to install mast arm on existing foundation.
• Powdercoating pay items include providing a color option for mast arms, either over the base mast arm material or over the galvanized mast arm material
• Decorative option per mast arm includes providing decorative features such as ornamental pole bases (skirts), fluted options, banner arms or curved options, in accordance with the special provisions or plans.
• Luminaire option for mast arm includes the additional cost for a taller pole (27'), if luminaire is to be mounted above the signal heads.
• Furnish and install mounting assembly pay items include installing the mounting hardware for signs and for signal heads on the mast arm, including all necessary hardware.
Furnish and install Luminaire includes all necessary materials, equipment and labor for full operational luminaire assembly, including electrical cable, conduit and meter pan if metered separately from traffic signal.

Pay items for mast arms designating the height and length of the mast arms will only be used when the Engineer has designed full mast arm plans; payment and will be paid for at the contract unit price Each (EA), and include all materials, hardware, manpower and equipment to fully install a functional mast arm assembly.

The following pay item will be measured by cubic yard (CY):
- Install Foundation for Mast Arm includes all materials and work necessary to completely install mast arm foundation, including rebar, concrete, conduit, and forms.

### 1.5 Payment

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<tr>
<td>6888172</td>
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<td>DECORATIVE OPTION PER MAST ARM</td>
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<td>LUMINAIRE OPTION FOR MAST ARM - TO ACCOUNT FOR TALLER POLE</td>
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<td>6888165</td>
<td>FURNISH &amp; INSTALL SINGLE LUMINAIRE INCLUDING LUMINAIRE ARMS AND ALL ASSOCIATED HARDWARE</td>
<td>EA</td>
</tr>
<tr>
<td>6888174</td>
<td>INSTALL FOUNDATION FOR MAST ARM INCLUDING CONCRETE AND REBAR</td>
<td>CY</td>
</tr>
<tr>
<td></td>
<td>FURNISH &amp; INSTALL __' STEEL POLE WITH __' MAST ARM INCLUDING FOUNDATION</td>
<td>EA</td>
</tr>
<tr>
<td></td>
<td>FURNISH &amp; INSTALL <strong>' STEEL POLE WITH TWIN MAST ARMS (</strong>'X__') AT ___ DEG. INCLUDING FOUNDATION</td>
<td>EA</td>
</tr>
</tbody>
</table>
TRAFFIC CONTROL:
The Contractor shall execute the item of Traffic Control as required by the Standard Specifications, the plans, the Standard Drawings For Road Construction, these special provisions, all supplemental specifications, the MUTCD, and the Engineer. This is an amendment to the Standard Specifications to require the following:

GENERAL REGULATIONS -

These special provisions shall have priority to the plans and comply with the requirements of the MUTCD and the standard specifications. Revisions to the traffic control plan through modifications of the special provisions and the plans shall require approval by the department. Final approval of any revisions to the traffic control plan shall be pending upon review by the Director of Traffic Engineering.

Install and utilize changeable message signs in all lane closures installed on high volume high-speed multilane roadways. Use of changeable message signs in lane closures installed on low volume low speed multilane roadways is optional unless otherwise directed by the plans and the Engineer. Install and use a changeable message sign within a lane closure set-up as directed by the Standard Drawings For Road Construction. When a lane closures is not present for any time to exceed 24 hours, remove the changeable message sign from the roadway. Place the sign in a predetermined area on the project site, as approved by the Engineer, where the sign is not visible to passing motorists. The preprogrammed messages utilized shall be in accordance with the Standard Drawings For Road Construction when used as part of the traffic control set-up for lane closures. Only those messages pertinent to the requirements of the traffic control situation and the traffic conditions are permitted for display on a changeable message sign at all times. At no time will the messages displayed on a changeable message sign duplicate the legends on the permanent construction signs.

During operation of changeable message signs, place the changeable message sign on the shoulder of the roadway no closer than 6 feet between the sign and the near edge of the adjacent travel lane. When the sign location is within 30' of the near edge of a travel lane open to traffic, supplement the sign location with no less than 5 portable plastic drums placed between the sign and the adjacent travel lane for delineation of the sign location. Install and maintain the drums no closer than 3 feet from the near edge of the adjacent travel lane. This requirement for delineation of the sign location shall apply during all times the sign location is within 30' of the near edge of a travel lane open to traffic, including times of operation and non-operation. Oversized cones are prohibited as a substitute for the portable plastic drums during this application.

All signs mounted on portable sign supports shall have a minimum mounting height of 5' from the bottom of the sign to the ground. All signs mounted on ground mounted u-channel posts or square steel tube posts shall have a minimum mounting height of 7' from the bottom of the sign to the grade elevation of the near edge of the adjacent travel lane or sidewalk when a sidewalk is present.

On multilane primary routes, avoid placement of signs mounted on portable sign supports within paved median areas utilized for two-way left turns unless otherwise directed by the RCE.

When mounting signs on multiple ground mounted sign supports, ensure that each post is of the same type. Combining and installing both ground mounted u-section and square steel tube posts within the same sign assembly is prohibited.

When mounting signs on ground mounted u-section or square steel tube posts, utilize either a sign support / ground support post combination with an approved breakaway assembly or a single direct driven post for each individual sign support of a sign assembly installation. Do not combine a sign support / ground support post combination and a direct driven post on the same sign assembly installation that contains two or more sign supports. Regarding sign support / ground support post combination installations, ensure that post lengths, stub heights and breakaway assemblies comply with the manufacturer’s requirements and specifications. Use approved breakaway assemblies found on the Approved Products List For Traffic Control Devices In Work Zones.

Temporary “Exit” signs (M1025-00) shall be located within each temporary gore during lane closures on multilane roadways. Mount these signs a minimum of 7’ from the pavement surface to the bottom of the sign in accordance with the requirements of the MUTCD.
When covering signs with opaque materials, the Department prohibits attaching a covering material to the face of the sign with tape or a similar product or any method that will leave a residue on the retroreflective sheeting. Residue from tape or similar products, as well as many methods utilized to remove such residue, damages the effective reflectivity of the sign. Therefore, contact of tape or a similar product with the retroreflective sheeting will require replacement of the sign. Cost for replacement of a sign damaged by improper covering methods will be considered incidental to providing and maintaining the sign; no additional payment will be made.

Overlays are prohibited on all rigid construction signs. The legends and borders on all rigid construction signs shall be either reversed screened or direct applied.

Signs not illustrated on the typical traffic control standard drawings designated for permanent construction signs shall be considered temporary and shall be included in the lump sum price bid item for “Traffic Control” unless otherwise specified.

Install “Grooved Pavement” signs (W8-15-48) supplemented with the “Motorcycle” plaque (W8-15P-30) in advance of milled or surface planed pavement surfaces. Install these signs no further than 500 feet in advance of the beginning of this pavement condition on primary routes with speed limits of 60 MPH or less and no less than 500 feet in advance of the beginning of this pavement condition on interstate routes. On multilane roadways, comply with the same guidelines as applied to all other advance warning signs and install two sign assemblies at each sign location, one on each side of the roadway, when roadway conditions warrant. Install these signs immediately upon creation of this pavement condition and maintain these signs until this pavement condition is eliminated.

Install “Steel Plate Ahead” signs (W8-24-48) in advance of an area of roadway where temporary steel plates are present. Install these signs no further than 300 feet in advance of locations where steel plates are present. On multilane roadways, comply with the same guidelines as applied to all other advance warning signs and install two sign assemblies at each sign location, one on each side of the roadway, when roadway conditions warrant. Install these signs immediately upon installation of a temporary steel plate and maintain the signs until the temporary steel plates are removed.

The Contractor shall maintain the travel patterns as directed by the traffic control plans and shall execute construction schedules expeditiously. The Contractor shall provide the Resident Engineer with no less than a two-week prior notification of changes in traffic patterns.

During nighttime flagging operations, flaggers shall wear a safety vest and safety pants that comply with the requirements of ANSI / ISEA 107 standard performance for Class 3 risk exposure, latest revision, and a fluorescent hard hat. The safety vest and the safety pants shall be retroreflectorized and the color of the background material of the safety vest and safety pants shall be fluorescent orange-red or fluorescent yellow-green.

During nighttime flagging operations, the contractor shall illuminate each flagger station with any combination of portable lights, standard electric lights, existing street lights, etc., that will provide a minimum illumination level of 108 Lx or 10 fc.

During nighttime flagging operations, supplement the array of advance warning signs with a changeable message sign for each approach. These changeable message signs are not required during daytime flagging operations. Install the changeable message signs 500’ in advance of the advance warning sign arrays. Messages should be “Flagger Ahead” and “Prepare To Stop”.

TRAFFIC CONTROL PROCEDURES SPECIFIC TO TRAFFIC SIGNAL WORK OPERATIONS –

Utilize a vehicle train consisting of a primary work vehicle and no less than 1 shadow vehicle. The shadow vehicle is required for all Traffic Signal Work Operations except on a two-lane roadway for a time duration of 15 minutes or less when no pedestrian workers are present, excluding the flagger. A second shadow vehicle is necessary in some applications on multilane roadways as depicted on the Standard Drawings. Install and maintain the vehicle train as directed by these special provisions, the Standard Drawings For Road Construction, and the Engineer.
Two-Lane Two-Way Roadways

A. Utilize flagging operations to control the traffic flow around the work site where the vehicle train is operating.

B. Utilize flaggers to control the traffic flow on an intersecting two-lane two-way roadway. The advance warning signs for the flagging operations shall include the following:

- W20-7a-48 Flagger symbol
- W20-4-48-A One Lane Road Ahead
- W20-1-48-A Road Work Ahead

C. Maintain two-way radio communications between all flaggers.

Multilane Roadways

A. During work operations that require the vehicle train to encroach upon or operate within the limits of a travel lane for a time duration of 15 minutes or less, advance warning signs may be omitted.

B. During work operations that require the vehicle train to encroach upon or operate within the limits of a travel lane for a time duration in excess of 15 minutes but less than 60 minutes, advance warning signs are required. Typical advance warning signs required for a temporary closure of a travel lane shall include the following:

- W4-2R(L)-48 Lane Ends symbol
- W20-5R(L)-48-A Right (Left) Lane Closed Ahead
- W20-1-48-A Road Work Ahead

C. Utilization of flaggers to control the traffic flow in the travel lanes adjacent to the travel lane the vehicle train is operating in is PROHIBITED except as allowed in the Standard Drawings Requirements for a Temporary Cessation of Traffic Flow for a time duration of 3 minutes or less.

D. Utilize flaggers to control the traffic flow on an intersecting two-lane two-way roadway. Only flaggers and advance warning signs are required on the approaches intersecting the travel lane the vehicle train is operating in. The advance warning signs for the flagging operations shall include the following:

- W20-7a-48 Flagger symbol
- W3-4-48 Be Prepared to Stop
- W20-1-48-A Road Work Ahead

E. During work operations that require the vehicle train to encroach upon or operate within the limits of a travel lane for a time duration in excess of 60 minutes, install a standard lane closure as directed by these special provisions, the Standard Drawings For Road Construction, and the Engineer.

Conduct all equipment and material preparations prior to entering the roadway.

Conducting traffic signal work or conducting any activities that interfere with or create disruptions to normal traffic operations during morning, mid-day, and afternoon-evening high traffic volume peak periods is PROHIBITED. The contractor shall observe all lane closure restrictions.

Conduct all work activities within the boundaries of a travel lane closed to vehicular traffic or a pedestrian thoroughfare closed to pedestrian traffic. Conducting work activities over a travel lane open to traffic is PROHIBITED. Conducting work activities over a pedestrian thoroughfare open to pedestrian traffic is PROHIBITED. Do not conduct any work activities in any manner over a thoroughfare open to vehicular or pedestrian traffic.
When advance warning signs are required to supplement the vehicle train, install the advance warning signs at spacing intervals based on the regulatory speed limit of the roadway prior to beginning any work. When a work zone traffic control plan or a work zone traffic control standard drawing is not provided to indicate the spacing intervals for a typical 3 advance warning sign array installation, utilize the sign placement intervals below. These sign intervals do not apply to the sign intervals of the advance sign intervals for standard lane closures.

<table>
<thead>
<tr>
<th>ADVANCE WARNING SIGN PLACEMENT INTERVALS</th>
</tr>
</thead>
<tbody>
<tr>
<td>URBAN / RURAL (LOW SPEED) ≤ 35 MPH</td>
</tr>
<tr>
<td>URBAN / RURAL (INTERMEDIATE SPEED) 40 - 50 MPH</td>
</tr>
<tr>
<td>RURAL (HIGH SPEED) ≥ 55 MPH</td>
</tr>
<tr>
<td>INTERSTATE</td>
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</tbody>
</table>

LANE CLOSURE RESTRICTIONS –

The lane closure restrictions stated below are project specific, for all other restrictions, see supplemental specification, “Restrictions”, dated September 1, 2015.

The Contractor shall install all lane closures as directed by the Standard Specifications For Highway Construction (latest edition), the Standard Drawings For Road Construction, these special provisions, the MUTCD, and the Engineer. The Contractor shall close the travel lanes of two-lane two-way roadways by installing flagging operations. The Contractor shall close the travel lanes of multilane roadways as directed by the typical traffic control standard drawings designated for lane closures on primary routes.

The Department prohibits lane closures on primary and secondary routes during any time of the day that traffic volumes in the travel lanes remaining open to traffic exceed 800 vehicles per hour per lane per direction. The Department reserves the right to suspend a lane closure if any resulting traffic backups are deemed excessive by the Engineer. Maintain all lane closure restrictions as directed by the plans, these special provisions, and the Engineer.

Flagging operations are considered to be lane closures for two-lane two-way operations and shall be subject to all restrictions for lane closures as specified by this contract.

Lane closures, including flagging operations, are restricted to maximum distances of 2 miles. Install all lane closures according to the typical traffic control standard drawings. On occasions when daytime lane closures must be extended into the nighttime hours, substitute the nighttime lane closure standards for the daytime lane closure standards.

The Department reserves the right to suspend a lane closure if any resulting traffic backups are deemed excessive by the Engineer. Maintain all lane closure restrictions as directed by the Standard Specifications, these special provisions, and the Engineer.
Installation and maintenance of a lane closure is PROHIBITED when the Contractor is not actively engaged in work activities specific to the location of the lane closure unless otherwise specified and approved by the Engineer. The length of the lane closure shall not exceed the length of roadway anticipated to be subjected to the proposed work activities within the work shift time frame or the maximum lane closure length specified unless otherwise approved by the Engineer. Also, the maximum lane closure length specified does not warrant installation of the specified lane closure length when the length of the lane closure necessary for conducting the work activity is less. The length and duration of each lane closure, within the specified parameters, shall require approval by the Engineer prior to installation. The length and duration of each lane closure may be reduced by the Engineer if the work zone impacts generated by a lane closure are deemed excessive or unnecessary.

The presence of temporary signs, portable sign supports, traffic control devices, trailer mounted equipment, truck mounted equipment, vehicles and vehicles with trailers relative to the installation or removal of a closure and personnel are prohibited within the 15 to 30 foot clear zone based upon the roadway speed limit during the prohibitive hours for lane closures specified by these special provisions.

The truck mounted changeable message signs are in addition to the requirements for trailer mounted changeable message signs. Truck mounted changeable message signs and trailer mounted changeable message signs are not interchangeable.

SHOULDER CLOSURE RESTRICTIONS

The Department prohibits the Contractor from conducting work within 15’ of the near edge of the adjacent travel lane on the outside shoulders or the median areas under a shoulder closure during any time that traffic volumes exceed 800 vehicles per hour per lane per direction. The hourly restrictions for lane closures shall also apply to work activities conducted under a shoulder closure within 15’ of the near edge of an adjacent travel lane or a median area. The Department reserves the right to suspend work conducted under a shoulder closure if any traffic backups develop and are deemed excessive by the Engineer. Maintain all shoulder closure restrictions as directed by the plans, these special provisions, and the Engineer.

On primary and secondary roadways, the Department prohibits the Contractor from conducting work within 1’ or less of the near edge of an adjacent travel lane under a shoulder closure. All work that may require the presence of personnel, tools, equipment, materials, vehicles, etc., within 1’ of the near edge of an adjacent travel lane shall be conducted under a lane closure.

The Contractor shall install all shoulder closures as directed by the typical traffic control standard drawings designated for shoulder closures, and the Engineer. Substitution of the portable plastic drums with oversized cones during nighttime shoulder closures is PROHIBITED.

TYPICAL TRAFFIC CONTROL STANDARD DRAWINGS

The typical traffic control standard drawings of the “Standard Drawings For Road Construction”, although compliant with the MUTCD, shall take precedence over the MUTCD. The typical traffic control standard drawings of the “Standard Drawings For Road Construction” shall apply to all projects let to contract.

ADDENDUMS

(Addendums to the “2007 Standard Specifications for Highway Construction”)

(A) Construction (Sub-section 601.4) –

Sub-section 601.4.2 Construction Vehicles (paragraph 2) -

When working within the rights-of-way of access-controlled roadways such as Interstate highways, the Contractor’s vehicles may only change direction of travel at interchanges. These vehicles are prohibited from crossing the roadway from right side to the median or vice versa. Use a flagger to control the
Contractor’s vehicles when these vehicles attempt to enter the roadway from a closed lane or the median area. Ensure the flagger does not stop roadway traffic, cause roadway traffic to change lanes, or affect roadway traffic in any manner. The Contractor’s vehicles may not disrupt the normal flow of roadway traffic or enter the travel lane of the roadway until a sufficient gap is present.

The Contractor shall have flaggers available to control all construction vehicles entering or crossing the travel lanes of secondary and primary routes. The RCE shall determine the necessity of these flaggers for control of these construction vehicles. The RCE shall consider sight distance, vertical and horizontal curves of the roadway, prevailing speeds of roadway traffic, frequency of construction vehicles entering or crossing the roadway and other site conditions that may impact the safety of the workers and motorists when determining the necessity of these flaggers. Ensure these flaggers do not stop roadway traffic, cause roadway traffic to change lanes or affect roadway traffic in any manner. The Contractor’s vehicles may not disrupt the normal flow of roadway traffic or enter the travel lane of the roadway until a sufficient gap is present.

When working within the rights-of-way of access-controlled roadways with posted regulatory speed limits of 55 MPH or greater and average daily traffic volumes (ADT) of 10,000 vehicles per day or greater, all construction and work vehicles possessing any one or more of the vehicular characteristics listed below are only permitted to enter and exit a right or left shoulder work area during the presence of active lane closures unless otherwise directed by the RCE. These vehicles are not permitted to enter or exit these work areas without the presence of active lane closures unless otherwise directed by the RCE. Shoulder closures are unacceptable and insufficient methods for control of traffic at ingress / egress areas for these vehicles. The restrictive vehicular characteristics include the following:

- Over six (6) tires
- Tandem rear axles
- A base curb weight greater than 8000 lbs.
- A gross vehicular weight greater than 12000 lbs. unless performing duties as a shadow vehicle while supporting a truck mounted attenuator
- A trailer in tow except under the following conditions:
  - Trailers transporting traffic control devices (including but not limited to standard and 42” oversized traffic cones, portable plastic drums, signs, portable sign supports, u-channel and square steel tube sign posts) relative to the installation of lane closures, shoulder closures or other traffic control operations approved by the RCE
  - Trailer mounted traffic control devices (including but not limited to advance warning arrow panels, changeable message signs, temporary traffic signals, highway advisory radios, work zone intelligent transportation systems and trailer towed truck mounted attenuators)

(B) **Construction (Sub-section 601.4)** –

**Sub-section 601.4.2 Construction Vehicles** -

**Auxiliary Warning Lights for Vehicles and Equipment** -

Supplement all construction and/or construction-related vehicles and equipment that operate in a stationary or mobile work zone within or adjacent to a roadway within the highway rights-of-way with AMBER or YELLOW colored high intensity rotating or strobe type flashing auxiliary warning light devices. Utilize, install, operate and maintain a single or multiple lighting devices as necessary to provide visibility to approaching motorists.

All auxiliary warning light models shall meet Society of Automotive Engineers (SAE) Class I standards and SAE Standard J575 relative to Tests for Motor Vehicle Lighting Devices and Components and these specifications.

The amber/yellow color of the dome/lens of an auxiliary warning light device shall meet SAE Standard J578 for amber/yellow color specifications.
Auxiliary warning lights with parabolic reflectors that rotate shall rotate around a halogen lamp at a rate to produce approximately 175 flashes per minute. The parabolic reflector shall produce a minimum 80,000 candle power and a minimum 54,000 candela through an SAE Standard J846 approved amber dome.

Equip strobe type flashing auxiliary warning light devices with photosensitive circuit controls to adjust the lighting intensity in response to changes in ambient light conditions such as from day to night. These lights shall have a double-flash capability rated at approximately 80 double flashes per minute and produce a minimum 24 joules of flash energy at the highest power level setting.

Acceptable auxiliary warning light models shall provide sufficient light output to be clearly recognizable at a minimum distance of 1750 feet.

Mount all auxiliary warning light devices intended to function as the auxiliary warning light system or as an element thereof on vehicles and equipment at locations no less than 3 feet above the ground and in conspicuous locations to provide visibility to approaching motorists.

Auxiliary warning light devices and/or models that mount in the locations of the standard vehicle lighting system are unacceptable as the specified auxiliary warning light system due to restrictive simultaneous visibility capabilities from multiple sight angles. However, auxiliary warning light devices that mount in the standard vehicle lighting system locations are acceptable as supplements to the specified lighting devices mounted in locations that do meet the minimum height requirements and provide simultaneous visibility capabilities from multiple sight angles.

Standard vehicle hazard warning lights are only permitted as supplements to the specified auxiliary warning light devices.

(C) General Requirements for Providing and Maintaining Traffic Control Devices in the Work Zone (Section 602) –

Sub-section 602.4 Construction (paragraph 8) -

Mount flat sheet signs straight and level and with the face of the signs perpendicular to the surface of the roadway. This requirement applies to flat sheet signs whether they are portable or have the embedded supports. Mount advance construction signs 2 feet from the edge of a paved shoulder or the face of a curb, or if no paved shoulder exists, 6 feet to 12 feet from the edge of an adjacent travel lane to the nearest edge of the signs. The mounting height of single signs mounted on ground embedded sign supports is no less than 7 feet or no greater than 8 feet from the bottom edge of the sign to the grade elevation of the near edge of the adjacent travel lane or sidewalk when a sidewalk is present. Any secondary sign on the same assembly has a minimum mounting height of 6 feet from the ground to the bottom edge of the secondary sign. Ensure that signs mounted on portable sign supports, including advance construction signs, regulatory signs, warning signs, etc., have a minimum mounting height of 5 feet from the ground to the bottom edge of the sign. Provide special sign mounting assemblies, when necessary, in areas of double-layered guardrail, concrete median barrier, or bridge parapet walls.

(D) Category I Traffic Control Devices (Section 603) –

Sub-section 603.2.2 Oversized Traffic Cones (paragraph 6) -

Reflectorize each oversized traffic cone with 4 retroreflective bands: 2 orange and 2 white retroreflective bands. Alternate the orange and white retroreflective bands, with the top band always being orange. Make each retroreflective band not less than 6 inches wide. Utilize Type III – Microprismatic retroreflective sheeting for retroreflectorization on all projects let to contract after May 1, 2010 unless otherwise specified. Separate each retroreflective band with not more than a 2-inch non-reflectorized area. Do not splice the retroreflective sheeting to create the 6-inch retroreflective bands. Apply the retroreflective sheeting directly to the cone surface. Do not apply the retroreflective sheeting over a pre-existing layer of retroreflective sheeting.

Sub-section 603.2.3 Portable Plastic Drums (paragraph 3) -
Reflectorize each drum with Type III – Microprismatic retroreflective sheeting: 2 orange and 2 white retroreflective bands, 6 inches wide on all projects let to contract after May 1, 2010 unless otherwise specified. Alternate the orange and white retroreflective bands with the top band always being orange. Ensure that any non-reflectorized area between the orange and white retroreflective bands does not exceed 2 inches. Do not splice the retroreflective sheeting to create the 6-inch retroreflective bands. Apply the retroreflective sheeting directly to the drum surface. Do not apply the retroreflective sheeting over a pre-existing layer of retroreflective sheeting.

**(E) Category II Traffic Control Devices (Section 604)** –

**Sub-section 604.2.1 Type I and Type II Barricades (paragraph 3)** -

Reflectorize these barricades with Type VIII or IX Prismatic retroreflective sheeting on all projects let to contract after May 1, 2012 unless otherwise specified. Ensure that the retroreflective sheeting has alternate orange and white stripes sloping downward at a 45-degree angle in the direction of passing traffic. The stripes shall be 6 inches wide.

**Sub-section 604.2.2 Type III Barricades (paragraph 3)** -

Reflectorize these barricades with Type VIII or IX Prismatic retroreflective sheeting on all projects let to contract after May 1, 2012 unless otherwise specified. Ensure that the retroreflective sheeting has alternate orange and white stripes sloping downward at a 45-degree angle. Apply the sloping orange and white stripes in accordance with the requirements of the Plans, SCDOT Standard Drawings and the MUTCD. The stripes shall be 6 inches wide.

**(F) Temporary Concrete Barrier (Sub-section 605.2.3.2)** –

**Sub-section 605.2.3.2 Temporary Concrete Barrier (paragraph 6)** -

Previously used temporary concrete barrier walls are subject to inspection and approval by the RCE before use. Ensure that previously used temporary concrete barrier walls are in good condition. Defects to a temporary concrete barrier wall that may disqualify a section of wall for use include gouges, cracks, chipped, or spalled areas. A defect that exposes reinforcing steel warrants immediate disqualification. A disqualification grade type defect shall consist of measurements in excess of 1 inch, entirely or partially within the boundaries of the end connection areas and the drainage slot areas as illustrated in the “Standard Drawings for Road Construction”, and/or in excess of 4 inches for all areas beyond the end connection areas. To warrant disqualification, these measurements shall exceed the specified dimensions in all three directions, width, height, and depth. A defect that exceeds the specified dimensions in only one or two of the three directions does not warrant disqualification.

Temporary concrete barrier walls with defects less than 6 inches in all three directions, width, height, and depth that do not expose reinforcing steel may be repaired in accordance with the following requirements. Repair is prohibited on temporary concrete barrier walls with defects 6 inches or greater in all three directions, width, height, and depth.

For repair of temporary concrete barrier walls with defects less than 6 inches in all three directions, width, height, and depth that do not expose reinforcing steel, repair the defect with a premanufactured patching material specifically fabricated for patching structural concrete. The strength of the patch must meet or exceed the design strength of the class 3000 concrete of the temporary concrete barrier wall. Perform the repair procedures in accordance with all requirements and instructions from the manufacturer of the patch material. Use a bonding compound between the patch material and the concrete unless specifically stated by the manufacturer that a bonding compound is not required. If the manufacturer states that application of a bonding compound is optional, SCDOT requires application of a bonding compound compatible with the patch material. If cracking occurs within the patched area, remove the patch material completely and repeat the repair process. The contractor shall submit documentation stating all repairs have been conducted in accordance with these requirements prior to installing any temporary concrete barrier walls with repairs. Utilization of temporary concrete barrier walls with repairs shall require approval by the RCE prior to installation.
The Contractor shall submit certification documents for the patch material utilized for repairs to the Engineer prior to placing temporary concrete barrier walls that have been repaired on the project site.

**Sub-section 605.2.3.2 Temporary Concrete Barrier (paragraph 5)**

In regard to projects let to contract after January 1, 2017, ALL NCHRP Report 350 compliant temporary concrete barrier walls placed on a project site SHALL comply with the requirements for the recessed approval stamp as directed by the SCDOT Standard Drawings. Those NCHRP Report 350 compliant temporary concrete barrier walls with the original recessed approval stamp that reads “SCDOT 350” will continue to be acceptable on projects let to contract after January 1, 2017. However, those temporary concrete barriers with the “SCDOT 350” identification plate attached to the side of the barrier walls with mechanical anchors previously grandfathered will no longer be acceptable on projects let to contract after January 1, 2017.

**(G) Construction Signs (Sub-section 605.4.1.1)** –

On all projects relative to interstate highways let to contract after January 1, 2016, all signs attached to portable sign supports on and/or adjacent to interstate highways shall be rigid. Fabricate each of these rigid signs from an approved aluminum laminate composite rigid sign substrate approved by the Department. Utilization of signs fabricated from roll-up fabric substrates attached to portable sign supports installed on and/or adjacent to interstate highways will no longer be acceptable on projects let to contract after January 1, 2016.

ONLY those portable sign supports specified and approved for support of rigid signs fabricated from approved aluminum laminated composite rigid sign substrates and included on the Approved Products List for Traffic Control Devices in Work Zones, latest edition, are acceptable. To facilitate location of acceptable portable sign supports, the listing of portable sign supports is now separated into two (2) sections: “Portable Sign Supports for Use with Roll-Up Signs ONLY” and “Portable Sign Supports for Use with Roll-Up Sign Substrates and Rigid Sign Substrates”.

The trade names of the approved aluminum laminate composite rigid sign substrates are “Acopan”, “Alpolic”, “Dibond” and “Reynolite”. These rigid sign substrates are restricted to thicknesses no greater than 2 millimeters.

Rigid signs fabricated from standard aluminum sign blanks or any other rigid material other than Acopan, Alpolic, Dibond or Reynolite are PROHIBITED for attachment to portable sign supports. However, rigid signs fabricated from standard 0.080 and 0.100 inches thick aluminum sign blanks will continue to be acceptable for mounting on ground mounted sign supports.

Signs fabricated from roll-up fabric substrates approved by the Department will continue to be acceptable for use on and/or adjacent to secondary and primary roadways unless otherwise directed by the Department.

The minimum mounting height of signs mounted on these portable sign supports shall continue to be 5 feet from the ground to the bottom edge of the sign except where a minimum 7 foot mounting height is required in accordance with the standard specifications, the standard drawings, these special provisions and the MUTCD, latest edition.

**(H) Truck-Mounted Attenuator (Sub-section 605.4.2.2)** –

**Sub-section 605.2.2.2.3.3 Color (paragraph 1)** -

Use industrial grade enamel paint for cover of the metal aspects of the unit. Provide and attach supplemental striping to the rear face of the unit with a minimum Type III high intensity retroreflective sheeting unless otherwise directed by the Department. Utilize an alternating 4 to 8 inch black and 4 to 8 inch yellow 45-degree striping pattern that forms an inverted “V” at the center of the unit that slopes down and to the sides of the unit in both directions from the center.

**(I) Truck-Mounted Attenuator (Sub-section 605.4.2.2)** –
Sub-section 605.4.2.2  Truck-Mounted Attenuators  (paragraph 6) -

A direct truck mounted truck mounted attenuator is mounted and attached to brackets or similar devices connected to the frame of a truck with a minimum gross vehicular weight (GVW) of 15,000 pounds (actual weight) unless otherwise directed. A trailer towed truck mounted attenuator is towed from behind and attached via a standard pintle hook / hitch to the frame of a truck with a minimum gross vehicular weight (GVW) of 10,000 pounds (actual weight) unless otherwise directed.

Each truck utilized with a truck mounted attenuator shall comply with the manufacturer’s requirements to ensure proper operation of the attenuator. The minimum gross vehicular weight (GVW) (actual weight) for each truck shall comply with these specifications unless otherwise directed within the “Remarks” column of the Approved Products List For Traffic Control Devices in Work Zones in regard to specific requirements for the device in question.

If the addition of supplemental weight to the vehicle as ballast is necessary, contain the material within a structure constructed of steel. Construct this steel structure to have a minimum of four sides and a bottom to contain the ballast material in its entirety. A top is optional. Bolt this structure to the frame of the truck. Utilize a sufficient number of fasteners for attachment of the steel structure to the frame of the truck to ensure the structure will not part from the frame of the truck during an impact upon the attached truck mounted attenuator. Utilize either dry loose sand or steel reinforced concrete for ballast material within the steel structure to achieve the necessary weight. The ballast material shall remain contained within the confines of the steel structure in its entirety and shall not protrude from the steel structure in any manner.

(J)  Trailer-Mounted Changeable Message Signs  (Sub-section 606.3.2) -

Sub-section 606.3.2.7  Controller  (paragraphs 1-4) -

The controller shall be an electronic unit housed in a weatherproof, rust resistant box with a keyed lock and a light for night operation. Provide the unit with a jack that allows direct communications between the on-board controller and a compatible personal computer. The unit shall have a LCD display screen that allows the operator to review messages prior to displaying the message on the sign.

The controller shall have the capability to store 199 factory preprogrammed messages and up to 199 additional messages created by the user in a manner that does not require a battery to recall the messages. Also, the controller shall allow the operator the capability to program the system to display multiple messages in sequence.

Provide the controller with a selector switch to allow the operator to control the brightness or intensity level of the light source of the sign panel. The selector switch shall include “bright,” “dim” and “automatic” modes; inclusion of additional modes is permissible. When the selector switch is in the “automatic” mode, a photosensitive circuit shall control the brightness or intensity level of the light source in response to changes in ambient light such as from day to night and other various sources of ambient light.

Equip each sign with remote communications capabilities, such as utilization of cellular telephone or internet browser technology, to allow the operator to revise or modify the message selection from the office or other remote location. Also, provide protection to prohibit unauthorized access to the controller, (i.e. password protection).

Sub-section 606.5  Measurement  (paragraph 2) -

Trailer-mounted changeable message signs are included in the lump sum item for Traffic Control in accordance with Subsections 107.12 and 601.5 of the “2007 Standard Specifications for Highway Construction”. No separate measurement will be made for trailer-mounted changeable message signs unless the contract includes a specific pay item for trailer-mounted changeable message signs.

The Contractor shall provide, install, operate, and maintain the trailer-mounted changeable message sign per traffic control set-up as directed by the Plans, the “Standard Drawings for Road Construction”, these Special Provisions, the Specifications, and the Engineer.

Sub-section 606.6  Payment  (paragraph 2) -
In addition to Subsections 107.12 and 601.6, the payment for Traffic Control is full compensation for providing, installing, removing, relocating, operating, and maintaining trailer-mounted advance warning arrow panels and trailer-mounted changeable message signs as specified or directed and includes providing the units’ primary power source; repairing or replacing damaged or malfunctioning units within the specified time; providing traffic control necessary for installing, operating, and maintaining the units; and all other materials, labor, hardware, equipment, tools, supplies, transportation, incidentals, and any miscellaneous items necessary to fulfill the requirements of the pay item in accordance with the Plans, the Specifications, and other items of the Contract.

Sub-section 606.6 Payment (paragraph 3) -

Disregard this paragraph unless the Contract includes a specific pay item for trailer-mounted changeable message signs.

(K) Temporary Pavement Markings (Sub-section 609.4.1) –

Sub-section 609.4.1.1.1 Application Requirements General (in addition to paragraph 3) -

On two-lane two-way roadways, apply and place temporary or permanent pavement markings, as specified hereupon, prior to the end of each day’s work or shift or reopening a closed travel lane to traffic. These pavement markings shall include 4-inch wide solid lines on edge lines and solid center lines and 4-inch wide by 10 feet long broken lines with a 30-foot gap for broken center lines and lane lines unless otherwise specified. The center line pavement markings shall be either double yellow solid lines, yellow broken lines or an appropriate combination of a yellow solid line and yellow broken lines for passing / no passing zones. Placement of a singular yellow solid line for a center line pavement marking is unacceptable. The edge line pavement markings shall be a white solid line.

On multilane primary and secondary roadways, apply and place temporary or permanent pavement markings, as specified hereupon, to the travel lanes prior to reopening a closed travel lane to traffic. These pavement markings shall include 4-inch wide solid lines, utilized for edge lines and solid center lines, and 4-inch wide by 10 feet long broken lines with a 30-foot gap, utilized for lane lines and turn lanes, unless otherwise specified. The center line pavement markings shall be either double yellow solid lines or an appropriate combination of a yellow solid line and 4-inch wide by 10 feet long yellow broken lines for two-way left turn median areas. The right edge line pavement markings shall be a white solid line and the left edge line shall be a yellow solid line except in areas where the travel lanes separate to create a gore type situation and then the color schemes shall comply with SCDOT application practices for gore areas. The lane lines between travel lanes and turn lanes shall be 4-inch wide by 10 feet long white broken lines with a 30-foot gap.

However, on two-lane two-way and multilane primary and secondary roadways, application of a 4-inch wide solid line utilized for an edge line adjacent to an earth shoulder, white or yellow, may be delayed up to 72 hours after eradication of the original line when the length of eradicated line at a single location is no longer than 250 feet. In the event of multiple locations along the same line, each location must be separated from the adjacent location by no less than 250 feet with a cumulative total distance of eradicated line of no more than 1300 feet within any continuous 1 (one) mile length of roadway measured from a selected location. If the length of eradicated line exceeds 250 feet at any single location, the distance interval between multiple adjacent locations is less than 250 feet or a cumulative total distance of multiple locations of eradicated line exceeds 1300 feet within any continuous 1 (one) mile length of roadway measured from a selected location, replace the eradicated line(s) prior to reopening the adjacent travel lane to traffic.

On interstate roadways, apply and place temporary or permanent pavement markings, as specified hereupon, to the travel lanes prior to reopening a closed travel lane to traffic. These pavement markings shall include 6-inch wide solid lines, utilized for edge lines, and 6-inch wide by 10 feet long white broken lines with a 30-foot gap, utilized for lane lines between travel lanes and auxiliary lanes, unless otherwise specified. The right edge line pavement markings shall be a white solid line and the left edge line shall be a yellow solid line except in areas where the travel lanes separate to create a gore type situation and then the color schemes shall comply with SCDOT application practices for gore areas.

On all roadways, apply and place white stop bars and white triangle yield bars in all locations where previous stop bars and triangle yield bars have been eradicated by the work. Apply and place white stop bars
and white triangle yield bars at intersections controlled by stop and yield signs within 72 hours of the eradication of the original pavement marking. Apply and place white stop bars at signalized intersections controlled by traffic control signals and at railroad crossings prior to reopening a closed travel lane to traffic.

Within the limits of existing turn lanes on all roadways, apply and place white arrows in all locations where previous arrows have been eradicated by the work unless otherwise directed by the RCE. Apply and place white arrows within 72 hours of the eradication of the original pavement markings. However, in regard to newly constructed turn lanes, apply and place white arrows the within turn lanes as directed by the RCE.

Within the limits of existing lane-drop sites on all roadways, apply and place white arrows in all locations where previous arrows have been eradicated by the work prior to the end of each day’s work or shift or reopening the closed travel lane to traffic. In regard to newly constructed lane-drop sites, apply and place white arrows within the travel lane to be terminated prior to opening the travel lane to traffic and as directed by the RCE.

(L) **Temporary Pavement Markings (Sub-section 609.4.1)**

**Sub-section 609.4.1.1. Application Requirements General (Revision to paragraph 8)**

On two-lane, two-way roadways, passing zones may be eliminated within the work zone through application of 4-inch double yellow centerline pavement markings if determined feasible and directed to do so by the Plans and/or the RCE. Apply no passing zone markings as specified by the Plans, the Specifications, the MUTCD and the RCE.

(M) **Flagging Operations (Sub-section 610.4.1)**

**Sub-section 610.4.1.1 Flagging Operations (paragraph 1)**

Use a flagging operation to control the flow of traffic when two opposing directions of traffic must share a common travel lane. A flagging operation may be necessary during a lane closure on a two-lane two-way roadway, an intermittent ramp closure or an intermittent encroachment of equipment onto a portion of the roadway. Utilize flagging operations to direct traffic around work activities and maintain continuous traffic flow at reduced speeds when determined to be appropriate by the RCE. As stated above, flagging operations shall direct traffic around the work activities and maintain continuous traffic flow, therefore, stopped traffic shall not be required to stop for time durations greater than those listed below unless otherwise directed by the RCE. Begin measurement of the time interval immediately upon the moment the Flagger rotates the Stop/Slow paddle to display the “Stop” condition to the approaching motorists.

<table>
<thead>
<tr>
<th>LENGTH OF CLOSURE</th>
<th>MAXIMUM TIME DURATION FOR STOPPED TRAFFIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 MILE OR LESS</td>
<td>5 Minutes</td>
</tr>
<tr>
<td>1 TO 2 MILES</td>
<td>7 ½ Minutes</td>
</tr>
</tbody>
</table>

If the work activities require traffic to be stopped for periods greater than 5 to 7 ½ minutes as stated above, consider alternate work methods, conducting work activities during times of lowest traffic volumes such as during the hours of darkness or complete road closure with detour installation.

(N) **Paving and Resurfacing (Sub-section 611.4.1)**

**Sub-section 611.4.1.2 Requirements (paragraph 8)**

Whenever travel lanes with acceptable grade elevation differences are open to traffic, provide “Uneven Lanes” signs (W8-11-48) or “Uneven Pavement” signs (W8-11A-48). Reflectorize these signs with a
fluorescent orange colored prismatic retroreflective sheeting unless otherwise specified. Install these signs adjacent to roadways with uneven pavement surfaces between travel lanes or between travel lanes and the adjacent paved shoulders. Install these signs at intervals no greater than 2600 feet.
1. LIST OF TRAFFIC SIGNALS WITHIN PROJECT

<table>
<thead>
<tr>
<th>#</th>
<th>Intersection Name</th>
<th>Description of Signal Work</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tr>
</tbody>
</table>

2. PROJECT DESCRIPTION

This Project is a [SELECT ONE] construction project and involves the signal construction of ______ intersections along _______ in and around South Carolina. The intersections involved are shown on the above “List of Traffic Signals within Project or listed on the plans.

Specific Description of the signal work: Specify details - Rebuild, New signals, Adjustments, Partial work, Communications, etc.

3. PAY ITEM ADDITIONAL INFORMATION (if no changes, this can be eliminated)

Below is more information concerning any changes, revisions, or clarifications to the SCDOT Traffic Signal Supplemental Specifications and/or pay items for this particular contract:

Mobilization:

Wiring:

Communications:

Detection:

Signal Supports:
Signal Heads, Pedestrian Treatments, Illuminated signs, solar flashing assemblies:

Cabinet Items:

Service Items:

4. **EQUIPMENT** *(Only needed if SCDOT is providing equipment to be installed by contractor.)*

6.1 SCDOT Provided Equipment *(Provide a list of equipment, location of equipment, details concerning equipment & installation)*

6.2 Faulty Equipment
   - When SCDOT supplied equipment is designated faulty by the Engineer, the Contractor shall return it to the Manufacturer for replacement if it is under warranty, The Manufacturer shall furnish a replacement unit.
   - When SCDOT supplied equipment is designated faulty by the Engineer and it is not under warranty, SCDOT shall replace the equipment.

5. **SIGNAL INTEGRATION** *(Only needed if different than the default. The default wording in the Supplemental Specifications (675.0 General Provisions 1.10) indicates SCDOT or local government signal maintenance staff will perform integration. If different than that, list what entity will perform integration.)*

   - The ________ will perform integration in accordance with the Supplemental Specifications, 675.0 General Provisions.

6. **MAINTENANCE DURING CONSTRUCTION** *(Only needed if different than the default. The default wording in the Supplemental Specifications (675.0 General Provisions 1.5) indicates that this begins at the contract NTP (notice to proceed) for all signals in the contract. If different than that, list whether maintenance begins at:)*
   a. When a work order is assigned by construction office
   b. When the contractor begins work at a signal
   c. Other option

7. **CONTRACT SCHEDULE** *(Only needed if different than the default. The default wording in the Supplemental Specifications indicates that contractor will to provide weekly schedule for all signal work. If SCDOT determines a need to set the schedule, indicate such below:)*

   Example wording:
   
   This is a "TURN-KEY" project where work is assigned using a work order system. Once work orders have been assigned to the **CONTRACTOR**, he shall furnish the Engineer with a **WEEKLY SCHEDULE** for all active traffic signal construction work orders, each Friday, for the week to come, listing the location and date of each intended activity. This will permit scheduling signal inspection personnel. Deviation from this schedule may cause the Department to delay Inspection and Payments.
Georgia Department of Transportation

Technical Provisions

For

Design-Build Agreement

P.I. No. 210327-

Attachment 3-1

CONCRETE BARRIER SPECIAL PROVISIONS

SP 621 Concrete Barrier
DEPARTMENT OF TRANSPORTATION  
STATE OF GEORGIA  
SPECIAL PROVISION  
P.I. NO: 210327-  
COUNTY: Richmond (GA) and Aiken (SC)  

Section 621—Concrete Barrier

Delete Subsection 621.2 and substitute the following:

621.2 Materials
Use materials that meet the requirements of the following Specifications:

<table>
<thead>
<tr>
<th>Material</th>
<th>Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>Portland Cement Concrete, Class AA</td>
<td>500</td>
</tr>
<tr>
<td>Steel Bars for Concrete Reinforcement</td>
<td>853.2.01</td>
</tr>
<tr>
<td>Joint Fillers and Sealers</td>
<td>833</td>
</tr>
</tbody>
</table>

Ensure that barrier walls and parapets on bridges are Class “AA” concrete unless otherwise specified on the Plans.

621.2.01 Delivery, Storage, and Handling
General Provisions 101 through 150.

Delete Subsection 621.3.05 A -- and substitute the following:

621.3.05 Construction
A. Formed or Slip Formed Barrier

Ensure that the barriers are Class AA concrete as defined in Section 500 and are constructed according to Plan details.

1. Place the concrete using conventional forms or an approved self-propelled extrusion machine. When using forms, give the barrier a Type III finish, and cured according to Section 500.

2. Construct joints of the type and at the locations specified on the Plans.
   a. When emergencies interrupt placement, the Engineer will decide whether to allow a construction joint and will direct where and how to construct the joint.
   b. Joints may be sawed or formed. If the joint is sawed within 24 hours of placement to at least 3 in (75 mm) deep using a template, immediately remove the following material:
      • Material that may damage the adjacent concrete by blocking the sawed joint
      • Material that may prevent later operation or cleaning after the sawing operation is complete
   c. Saw the joints through the footing.

3. The outside vertical face of the side barrier or parapet may be battered as directed by the Engineer. Radii, as approved by the Engineer, may be used at intersecting surfaces of the barrier.

Make approved requested changes at no cost to the Department.
GEORGIA DEPARTMENT OF TRANSPORTATION

DESIGN-BUILD CONTRACT

PROJECT NUMBER
P.I. No. 210327-

CONTRACT ID
B1CBA1801645-0

I-20 AT SAVANNAH RIVER BRIDGE REPLACEMENTS

AND ROADWAY WIDENING PROJECT

Dated Advertisement: June 14, 2018

Amendment 1 Issued: July 27, 2018

Amendment 2 Issued: August 31, 2018

Amendment 3 Issued: September 17, 2018

Letting Date: October 19, 2018
Georgia Department of Transportation

Technical Provisions

For

Design-Build Agreement

P.I. No. 210327-

Attachment 4-1

ENVIRONMENTAL COMMITMENTS TABLE
## Environmental Commitments Table

**PI#: 210327-, Count: Richmond**  
**Date Updated: 7/31/2018 | Stage: CE Approval**  
**Transmittal Date for Plans Reviewed by OES (if applicable): N/A**

The GDOT project manager (PM) asserts that these commitments are feasible.  
GDOT PM: Matt Bennett  
Signature/Date: _______________

The engineer of record (EOR) asserts that plans incorporate or will incorporate commitments if applicable.  
EOR: Kristen Kasmire, P.E.  
Signature/Date: _______________

**Air/Noise:** MDK-05/14/18  
**Arch:** MDC-05/14/18  
**Eco:** HLH-06/22/18  
**Hist:** RJ-05/14/18  
**NEPA:** SB-05/14/18

---

### A. Resources to be Delineated on the Plans and/or Listed in the Environmental Resource Impact Table (ERIT)

<table>
<thead>
<tr>
<th>Resource Name</th>
<th>Permitted Construction Activity</th>
<th>Refer to</th>
<th>Name and Date of Report or Transmittal</th>
<th>Correctly Shown?</th>
</tr>
</thead>
<tbody>
<tr>
<td>A-1 Open Water (OW) 1</td>
<td>No impact</td>
<td>C-1</td>
<td>May 2018 Ecology Report Addendum</td>
<td>No No</td>
</tr>
<tr>
<td>A-2 OW 1 Buffer</td>
<td>&quot;</td>
<td>&quot;</td>
<td>&quot;</td>
<td>&quot;</td>
</tr>
<tr>
<td>A-3 Canal (CL) 2 (Augusta Canal)</td>
<td>1.03 acres of temporary cofferdam impoundment and 0.03 acres of permanent fill impact</td>
<td>B-1, C-1, C-2, E-7, E-9, E-10, E-11</td>
<td>&quot;</td>
<td>&quot;</td>
</tr>
<tr>
<td>A-4 CL 2 Buffer</td>
<td>Activities within 100 feet of the proposed bridge are exempted</td>
<td>C-1</td>
<td>&quot;</td>
<td>&quot;</td>
</tr>
<tr>
<td>A-5 Wetland (WL) 3</td>
<td>No impact</td>
<td>&quot;</td>
<td>&quot;</td>
<td>&quot;</td>
</tr>
<tr>
<td>A-6 WL 4</td>
<td>&quot;</td>
<td>&quot;</td>
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</tr>
<tr>
<td>A-7 Perennial Stream (PS) 5 (Savannah River)</td>
<td>202 linear feet (6.74 acre) of temporary cofferdam impoundment and 70 lf (0.26 acre of permanent fill impact</td>
<td>B-1, C-1, E-2, E-9</td>
<td>&quot;</td>
<td>&quot;</td>
</tr>
<tr>
<td>A-8 PS 5 Buffer</td>
<td>Activities within 100 feet of the proposed bridge are exempted</td>
<td>C-1</td>
<td>&quot;</td>
<td>&quot;</td>
</tr>
<tr>
<td>A-9 PS 6 (Fox Creek)</td>
<td>No impact</td>
<td>&quot;</td>
<td>&quot;</td>
<td>&quot;</td>
</tr>
<tr>
<td>A-10 WL 7</td>
<td>&quot;</td>
<td>&quot;</td>
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<tr>
<td>A-11 WL 8</td>
<td>&quot;</td>
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<tr>
<td>A-12 WL 9</td>
<td>&quot;</td>
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<tr>
<td>A-13 Intermittent Stream (IS) 10</td>
<td>&quot;</td>
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<tr>
<td>A-14 WL 11</td>
<td>&quot;</td>
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<tr>
<td>A-15 IS 12</td>
<td>&quot;</td>
<td>&quot;</td>
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<td>&quot;</td>
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<tr>
<td>A-16 IS 13</td>
<td>&quot;</td>
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<tr>
<td>A-17 WL 14</td>
<td>&quot;</td>
<td>&quot;</td>
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<td>&quot;</td>
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<tr>
<td>A-18 PS 15</td>
<td>&quot;</td>
<td>&quot;</td>
<td>&quot;</td>
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<tr>
<td>A-19 PS 16 (Fox Creek)</td>
<td>&quot;</td>
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<tr>
<td>A-20 IS 17</td>
<td>&quot;</td>
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<tr>
<td>A-21 PS 18</td>
<td>&quot;</td>
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<tr>
<td>A-22 PS 19</td>
<td>&quot;</td>
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<td>A-23 IS 20</td>
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<td>A-24 IS 21</td>
<td>&quot;</td>
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<tr>
<td>A-25 WL 22</td>
<td>&quot;</td>
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<tr>
<td>A-26 IS 23</td>
<td>&quot;</td>
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<td>&quot;</td>
</tr>
<tr>
<td>A-27 IS 24</td>
<td>&quot;</td>
<td>&quot;</td>
<td>&quot;</td>
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</tr>
</tbody>
</table>

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Estimated Costs are for planning purpose only, in current dollars as of date updated.
### ENVIRONMENTAL COMMITMENTS TABLE

**PI#: 210327-, County: Richmond**

**Date Updated: 7/31/2018 | Stage: CE Approval**

**Transmittal Date for Plans Reviewed by OES (if applicable): N/A**

<table>
<thead>
<tr>
<th>Resource Name</th>
<th>Permitted Construction Activity</th>
<th>Refer to</th>
<th>Name and Date of Report or Transmittal</th>
<th>Correctly Shown?</th>
</tr>
</thead>
<tbody>
<tr>
<td>A-28 PS 25</td>
<td>&quot;</td>
<td>&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A-29 PS 26</td>
<td>(Pole Branch)</td>
<td>&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A-30 WL 27</td>
<td>&quot;</td>
<td>&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A-31 IS 28</td>
<td>&quot;</td>
<td>&quot;</td>
<td></td>
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</tr>
<tr>
<td>A-32 IS 29</td>
<td>&quot;</td>
<td>&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A-33 Augusta Canal and Industrial District National Historic Landmark (NHL)/ESA—Resource 1</td>
<td>Bridge construction within boundary within existing I-20 right-of-way (ROW)</td>
<td>C-1, C-2, C-3, C-5, E-7, E-8, E-9, E-10, E-11, E-12</td>
<td>ESA boundary transmittal dated 06/23/2017; April 2018 Historical Resources Assessment of Effect (AOE)</td>
<td>&quot;</td>
</tr>
<tr>
<td>A-34 Listed Species</td>
<td>Bridge construction and roadway widening, such that harm to listed species is avoided</td>
<td>B-1, E-3, E-5, E-9, E-14</td>
<td>May 2018 Ecology Report Addendum</td>
<td>&quot;</td>
</tr>
<tr>
<td>A-35 ESA (mainline STA 383+00 RT – beyond stationing and mainline STA 380+00 LT – beyond stationing)</td>
<td>No activity</td>
<td>B-1, C-1, E-3, E-5</td>
<td>&quot;</td>
<td>&quot;</td>
</tr>
<tr>
<td>A-36 Augusta Canal National Heritage Area (Including Augusta Canal Towpath)</td>
<td>Roadway widening and bridge construction within existing I-20 ROW</td>
<td>C-1, C-2, C-4, C-5, E-6, E-7, E-8, E-9, E-10, E-12</td>
<td>Categorical Exclusion (CE)</td>
<td>&quot;</td>
</tr>
<tr>
<td>A-37 ESA—Resource 2 (mainline STA 351+22.80 to 352+22.78 LT)</td>
<td>No activity</td>
<td>C-1, E-1</td>
<td>ESA boundary transmittal dated 06/23/2017</td>
<td>&quot;</td>
</tr>
<tr>
<td>A-38 ESA—Resource 3 (mainline STA 360+95.78 to 361+95.78 RT)</td>
<td>&quot;</td>
<td>C-1, C-5</td>
<td>&quot;</td>
<td>&quot;</td>
</tr>
</tbody>
</table>

**B. Special Provisions (Attach all special provisions with transmittal letters to the commitments table, if available)**

<table>
<thead>
<tr>
<th>Special Provision</th>
<th>Purpose</th>
<th>Est. Cost</th>
<th>SP’s Latest Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>B-1 107.23H</td>
<td>For protection of the robust redhorse, relict trillium, delicate spike, Atlantic pigtoe, and Savannah lilliput</td>
<td>Undetermined</td>
<td>07/24/18</td>
</tr>
</tbody>
</table>

**C. ERIT Comments and Design Features (Description: For ERIT Comments, provide exact wording for the comments section of the ERIT)**

<table>
<thead>
<tr>
<th>ERIT Comment or Design Feature</th>
<th>Description</th>
<th>Est. Cost</th>
<th>Correctly Shown?</th>
</tr>
</thead>
<tbody>
<tr>
<td>C-1 ERIT Comment</td>
<td>Designed as an Environmentally Sensitive Area; follow specification 107.23.F. See Section A for applicable resources.</td>
<td>Negligible</td>
<td>No</td>
</tr>
<tr>
<td>C-2 Design Feature</td>
<td>No permanent piers shall be located within 35 feet of the Augusta Canal centerline. The minimum span over the Augusta Canal’s channel shall be 90 feet to allow for continued boat passage.</td>
<td>Negligible</td>
<td>No</td>
</tr>
<tr>
<td>C-3 Design Feature</td>
<td>Bridge end slopes shall be located outside the Augusta Canal and Industrial District NHL.</td>
<td>Negligible</td>
<td>No</td>
</tr>
<tr>
<td>C-4 Design Feature</td>
<td>An additional one foot of vertical clearance (for a minimum of 11 feet of clearance) shall be provided over the towpath (in the easternmost span of the Augusta Canal bridge) to provide improved access for Augusta Canal Authority maintenance vehicles under the bridge.</td>
<td>Unknown</td>
<td>No</td>
</tr>
</tbody>
</table>

Estimated Costs are for planning purpose only, in current dollars as of date updated.
Orange barrier fencing (OBF) would be placed along the existing I-20 ROW line in the area of the Historic Augusta Canal and Industrial District NHL and Resource 3 to protect these areas during construction. The OBF in the area of the Augusta Canal shall extend from each canal bank outward for approximately 100 feet. On the eastern bank, the OBF shall not cross over the Augusta Canal Towpath to allow continued access for Towpath users.

### D. Necessary Permits, Buffer Variances and Mitigation Credits

<table>
<thead>
<tr>
<th>Permit, Variance, etc.</th>
<th>Add'l Info (permit expiration date, number of credits needed, etc.)</th>
<th>Est. Cost</th>
<th>Acquired?</th>
</tr>
</thead>
<tbody>
<tr>
<td>D-1 Notice of Intent (NOI) for Nonpoint Discharge Elimination System (NPDES)</td>
<td>The Design-Build Contractor will submit an NOI to the NPDES General Permit to the Georgia Environmental Protection Division (EPD) following award of the contract but prior to construction activities.</td>
<td>Negligible</td>
<td>No</td>
</tr>
<tr>
<td>D-2 Section 404 Nationwide Permit</td>
<td>GDOT and Design-Build Contractor will apply for Section 404 Nationwide Permits 23 (for the Augusta Canal) and 15 (for the Savannah River) from the U.S. Army Corps of Engineers (USACE). These permits shall be obtained prior to any construction activities impacting waters of the U.S.</td>
<td>Negligible</td>
<td>No</td>
</tr>
<tr>
<td>D-3 Stream Mitigation Credits</td>
<td>Impacts to streams will be mitigated through the purchase of compensatory mitigation credits from a USACE-approved commercial mitigation bank servicing HUC 3060106. It is estimated that 3,264 stream mitigation credits will be needed.</td>
<td>$186,864 (estimated at $57.25 per stream credit)</td>
<td>No</td>
</tr>
<tr>
<td>D-4 Wetland Mitigation Credits</td>
<td>Impacts to the Augusta Canal will be mitigated through the purchase of compensatory mitigation credits from a USACE-approved commercial mitigation bank servicing HUC 3060106. It is estimated that 8.48 wetland mitigation credits will be needed.</td>
<td>$72,080 (estimated at $8,500 per wetland credit)</td>
<td>No</td>
</tr>
<tr>
<td>D-5 Permit for Construction in Navigable Waters</td>
<td>GDOT and Design-Build Contractor will apply for a Permit for Construction in Navigable Waters from the South Carolina Department of Health and Environmental Control prior to any construction activities impacting the Savannah River.</td>
<td>Negligible</td>
<td>No</td>
</tr>
</tbody>
</table>

### E. Other Commitments or Requirements (Status: Pre- and Post – Complete or Incomplete; During – Signature Req’d)

<table>
<thead>
<tr>
<th>Pre-, During, or Post</th>
<th>Commitment</th>
<th>Responsible Party</th>
<th>Est. Cost</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>E-1 Pre-construction</td>
<td>If the Design-Build Contractor determines that avoidance of Resource 2 is not feasible, additional investigations in the form of diver identification by qualified underwater archaeologists would occur prior to construction, including a determination of significance.</td>
<td>GDOT Office of Innovative Delivery (OID), Office of Environmental Services (OES) and Design-Build Contractor</td>
<td>Undetermined</td>
<td>Incomplete</td>
</tr>
<tr>
<td>E-2 Pre-construction</td>
<td>The Design-Build Contractor will prepare final hydrologic and hydraulic analysis using the most current information available. A &quot;no rise&quot; certification and Community coordination/concurrence will be required for the Savannah River. This concurrence shall be obtained by the Contractor prior to commencing construction activities in the area of the River.</td>
<td>GDOT OID and Design-Build Contractor</td>
<td>Negligible</td>
<td>Incomplete</td>
</tr>
</tbody>
</table>

Estimated Costs are for planning purpose only, in current dollars as of date updated.
<table>
<thead>
<tr>
<th>E-3</th>
<th>Pre-construction</th>
<th>GDOT shall conduct surveys for relict trillium within the existing South Carolina right-of-way (ROW) in the project limits during the first flowering season after preliminary plans are received and before construction begins. Should relict trillium individuals be found beyond the known occurrence locations during these follow-up surveys, GDOT would develop and implement a relocation plan for affected individuals, as needed. If plants are found in any areas to be cleared, re-initiation of Section 7 shall occur, and coordination with USFWS shall occur in the development and implementation of any relocations plans.</th>
<th>GDOT OID, GDOT OES, and Design-Build Contractor</th>
<th>Undetermined</th>
<th>Incomplete</th>
</tr>
</thead>
<tbody>
<tr>
<td>E-4</td>
<td>Pre-Construction</td>
<td>If construction does not commence by January 5, 2019, GDOT shall complete a new Bridge Project Questionnaire for the project and submit it to FHWA for review/approval.</td>
<td>GDOT OID</td>
<td>$0</td>
<td>Incomplete</td>
</tr>
<tr>
<td>E-5</td>
<td>Pre-, During, and Post-Construction</td>
<td>Within the I-20 ROW in South Carolina, signs shall be placed in locations designated on the signing and marking plans associated with the Costing Plans and in the Design-Build Contract that state: “No Spraying/No Clearing Year-Round.” These signs shall be placed prior to the installation of OBF during construction and shall be permanent.</td>
<td>GDOT OID, OES, and Design-Build Contractor</td>
<td>Negligible</td>
<td>Incomplete</td>
</tr>
<tr>
<td>E-6</td>
<td>During Construction</td>
<td>Up to two temporary daytime closures of the Augusta Canal Towpath (for a duration of up to 8 weeks each time) would be allowed during construction. These temporary daytime Towpath closures shall be restricted to occurring in winter months only (December through February), when the Towpath is less utilized.</td>
<td>GDOT OID and Design-Build Contractor</td>
<td>Negligible</td>
<td>Incomplete</td>
</tr>
<tr>
<td>E-7</td>
<td>During Construction</td>
<td>Restriction of recreational use (i.e., canoeing and kayaking) of the Augusta Canal under the I-20 bridges would be allowed during bridge demolition for public safety. This restriction shall be limited to the immediate area of the I-20 bridges, and shall be for a duration of up to 8 weeks. Any restriction of canal recreational use for bridge demolition would be limited to winter months only (December through March).</td>
<td>GDOT OID and Design-Build Contractor</td>
<td>Negligible</td>
<td>Incomplete</td>
</tr>
<tr>
<td>E-8</td>
<td>During Construction</td>
<td>Prior to any closure of the Augusta Canal Towpath or recreational use of the canal at the I-20 bridges, the Design-Build Contractor shall work with the Augusta Canal Authority to conduct public outreach regarding the pending closure. This public outreach would include, at a minimum, posting notifications/flyers at all Towpath trailheads and at the Discovery Center, as well as on the Augusta Canal Facebook page and website. The amount and type of public outreach shall be determined by the Augusta Canal Authority.</td>
<td>GDOT OID and Design-Build Contractor</td>
<td>Undetermined</td>
<td>Incomplete</td>
</tr>
<tr>
<td>E-9</td>
<td>During Construction</td>
<td>During construction/demolition of the I-20 bridges, debris curtains and/or netting shall be utilized under the bridges to catch falling debris. In addition, a temporary safety canopy shall be constructed over the Augusta Canal Towpath in the vicinity of the construction zone to allow for safe passage of trail users under the bridges during the construction period.</td>
<td>GDOT OID and Design-Build Contractor</td>
<td>Undetermined</td>
<td>Incomplete</td>
</tr>
<tr>
<td>E-10</td>
<td>During Construction</td>
<td>Complete drainage of the water in the Augusta Canal for construction shall not be allowed. Partial drainage may be allowed upon coordination with and within parameters established by the Augusta Utilities Department and Augusta Canal Authority.</td>
<td>GDOT OID and Design-Build Contractor</td>
<td>$0</td>
<td>Incomplete</td>
</tr>
</tbody>
</table>

Estimated Costs are for planning purpose only, in current dollars as of date updated.
### ENVIRONMENTAL COMMITMENTS TABLE

<table>
<thead>
<tr>
<th>PI#: 210327-, County: Richmond</th>
<th>Date Updated: 7/31/2018</th>
<th>Stage: CE Approval</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Transmittal Date for Plans Reviewed by OES (if applicable): N/A</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>E-11</th>
<th>During Construction</th>
<th>No blasting shall be allowed in the Augusta Canal during construction.</th>
<th>GDOT OID and Design-Build Contractor</th>
<th>$0</th>
<th>Incomplete</th>
</tr>
</thead>
<tbody>
<tr>
<td>E-12</td>
<td>During Construction</td>
<td>No disruptions to the Augusta Canal Authority boat tours shall be allowed.</td>
<td>GDOT OID and Design-Build Contractor</td>
<td>$0</td>
<td>Incomplete</td>
</tr>
<tr>
<td>E-13</td>
<td>During Construction</td>
<td>Any necessary lane closures shall be limited to nights, and shall not interfere with the Masters Golf Tournament.</td>
<td>GDOT OID and Design-Build Contractor</td>
<td>$0</td>
<td>Incomplete</td>
</tr>
<tr>
<td>E-14</td>
<td>During Construction</td>
<td>Consultation with National Marine Fisheries Service (NMFS) under Section 7 of the Endangered Species Act shall be reinitiated if in-water construction work is not completed by the anticipated completion of the New Savannah Bluff Lock and Dam Fish Passage Project (currently projected as March 2022).</td>
<td>GDOT OID, OES, and Design-Build Contractor</td>
<td>Undetermined</td>
<td>Incomplete</td>
</tr>
<tr>
<td>E-15</td>
<td>Post Construction</td>
<td>Upon completion of construction, GDOT shall provide a set of “as built” drawings, which include horizontal and vertical clearance of the bridge across the Savannah River, to the U.S. Coast Guard’s Bridge Administration Branch.</td>
<td>GDOT OID</td>
<td>$0</td>
<td>Incomplete</td>
</tr>
</tbody>
</table>

**Total Estimated Cost** $258,994

*If Project is Complete or Under Construction, Area or Construction Engineer affirms that all Special Provisions, Plan Notes and During Construction Commitments were or are being adhered to during the project’s construction.*

*Please Print Name and Title: ____________________________ Signature: __________________ Date: __________ Please provide an explanation if unable to sign.*

Estimated Costs are for planning purpose only, in current dollars as of date updated.
Georgia Department of Transportation

Technical Provisions
For
Design-Build Agreement
P.I. No. 210327-

Attachment 4-2

LEGAL REGULATIONS AND RESPONSIBILITY TO THE PUBLIC

SP 107.23.H Legal Regulations and Responsibility to the Public
DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

SPECIAL PROVISION

PROJECT: IM000-0020-02(117), PI 210327-
Richmond County, Georgia
Section 107 – Legal Regulations and Responsibility to the Public

Add the following to Subsection 107.23:

H. Protection of Federal and State Protected Species

The following conditions are intended as a minimum to protect these species and their habitat during any activities that are in close proximity to the known or potential location(s) of these species.

1. All Project personnel shall be advised of the potential presence and appearance of the federally protected relict trillium (*Trillium reliquum*) in the project area, and that there are civil and criminal penalties for harassing, harming, pursuing, hunting, shooting, wounding, killing, capturing, or collecting this species in violation of the Endangered Species Act of 1973. All Project personnel shall be notified of the potential presence and appearance of the state listed robust redhorse (*Moxostoma robustum*), delicate spike (*Elliptio arctata*), Atlantic pigtoe (*Fusconaia masoni*), and Savannah lilliput (*Toxolasma pullus*) and that there are civil and criminal penalties for harassing, harming, pursuing, hunting, shooting, wounding, killing, capturing, or collecting this species in violation of the Georgia Endangered Wildlife Act of 1973. Pictures and habitat information are attached and shall be posted in a conspicuous location in the Project field office until such time that Project construction has been completed and time charges have stopped.

The following items applies to work within the Savannah River, and shall be adhered to until final acceptance of the Project:

2. Extreme care shall be taken in lowering equipment or materials, including, but not limited to casings for drilled shaft construction, spuds, pile templates, girders, etc., over the water surface to limit the potential of dropping items onto listed species. Lowering equipment or materials from above into the cofferdams would be completed taking precaution not to increase noise/vibration and harm to listed species that may have entered the construction area undetected. The maximum speed at which these items can be lowered shall be 10 feet per minute to limit potential vibrations upon landing.

3. Column or footing work within the Savannah River bed shall not be conducted over or in water. However, work may be permitted over water from a platform attached to the proposed permanent bridge columns as long as the platform were built and attached to the columns while the cofferdam is in place.

4. No uncured concrete or water used to facilitate curing should be discharged directly into the stream; curing water should be pumped into filter bags (i.e., “dirt bags”) or detention basins before coffer dams or other diversion structures are dismantled. These measures will help protect water quality in the vicinity of the bridge crossings as well as downstream.

5. Should barges or bulkheads be proposed for use in the Savannah River, then consultation with GADNR would be reinitiated and impacts associated with these alternate means would be assessed on robust redhorse. If these practices are used, the Contractor shall bear all costs and no additional time shall be granted.

6. Protective materials shall be in place under the existing and proposed bridges during all phases of demolition and construction to prevent debris or tools from falling on the riverbed or into the water. Should cofferdams be used, then this requirement can be met with the use of geotextile fabric or similar device placed such that all debris will be contained and can be removed from the river bed. In the event that construction or demolition debris, waste, tools, or other materials accidentally fall into the Savannah River, immediately notify the Project Engineer, who in turn shall notify the State Environmental Administrator, GDOT OES at 404-631-1101. All project activities within the affected area shall cease, with
the exception of necessary traffic control and erosion control activities, pending consultation by the Department with the lead federal agency, GA and SC DNRs.

7. Work shall not be allowed in the Savannah River from March 1 through July 1 due to the spawning of robust redhorse which is currently present within PS5. No equipment or construction materials of any type shall be allowed to fall or be placed in the river during this restricted time period. Construction activities may take place during this restricted time period from or within cofferdams as long as they are installed outside of the restrictive season (i.e., between July 2 through February 28 [or February 29 during leap year]). Construction activities may also take place during this restricted time period above the water from the existing or proposed bridges.

The following items apply to work within the South Carolina ROW where noted, the Savannah River, and the Augusta Canal (Canal [CL] 2) conducted at any time, and shall be adhered to until final acceptance of the Project:

8. No earth or rock cofferdams (rock jetties) placed directly on the Savannah River or Augusta Canal bed shall be used. If cofferdams are used, then portable cofferdam systems, i.e., geomembrane over steel profile, inflatable geomembrane, or cubic-yard filled geotextile bags shall be used by the Contractor. In order to minimize the potential spread of invasive species, inert materials shall be used for filling geomembrane or geotextile bag cofferdams.

9. At least three (3) days prior to installation of all cofferdams, GADNR and SCDNR shall be notified of the scheduled installation. Installation of cofferdams/portadams, water diversions, or other temporary water containment structure within the Savannah River or Augusta Canal shall be built from upstream continuing downstream so as not to trap fish and other aquatic animals.

10. The contractor shall hire an ecologist prequalified in Area Class 1.06(e) to be present for all cofferdam dewatering events. If fish or other visible aquatic animal species are trapped within these structures, the contract ecologist shall remove them and place within the stream outside of these structures without harm.

11. For each dewatering event, the contract ecologist shall submit a log detailing species and count numbers removed from within the cofferdam. The log shall be submitted within two (2) business days of each dewatering event to the State Environmental Administrator via the Ecology Submittals Inbox (Ecology_submittals@dot.ga.gov). The email shall be formatted with the title "Cofferdam Dewatering Report: PI# 210327". The State Environmental Administrator in turn will provide the log to SCDNR, GADNR, and the lead federal agency within five (5) business days of receipt.

12. The following shall be used prior to any pumping of water from the Savannah River or Augusta Canal:
   a. A fish excluder shall be attached to the pump intake hose to further protect fish. A system using a 5-gallon bucket with holes no larger than 11 mm shall be used to limit entry of robust redhorse larvae.
   b. A fine mesh screen shall be installed on the intake hose with mesh sizes of 0.5 mm to 1.0 mm to protect fish life stages.
   c. The maximum through-screen velocity of 0.5 feet per second shall be maintained during pumping to reduce fish impingement.

13. The required erosion control measures are to be considered minimum erosion control requirements for this area. Install other erosion control measures as needed or directed by the Project Engineer to ensure effective erosion control and sedimentation containment.

14. The use of borrow sites or stockpiling of dirt within 200 feet of the banks of the Augusta Canal and Savannah River shall be prohibited. Stockpiled materials shall be placed at least 200 feet away from the banks of the Savannah River and Augusta Canal to minimize contaminated runoff into the stream. All disturbed soil and excavation spoil within 200 feet of the banks of the Savannah River and Augusta Canal shall be mulched daily or covered with erosion control mats.

15. Equipment staging areas and equipment maintenance areas (particularly for oil changes) shall be located at least 200 feet from Augusta Canal and Savannah River stream banks to minimize the potential for wash water, petroleum products, or other contaminants from construction equipment entering the River or Canal.

16. All erosion control devices shall be closely monitored. For erosion control devices within 200 feet of the Augusta Canal,
Savannah River, and throughout the South Carolina project ROW, when one-third of the capacity of any device has been reached, the device shall be immediately cleaned out. As maintenance is performed on silt fences, silt gates, slope drains, filtration ponds, and other erosion control devices, the materials removed shall be placed in such a manner to prevent these materials from entry into the Savannah River or into designated ESAs in the South Carolina project ROW.

17. The Project Engineer shall be notified immediately of any circumstances that may cause or allow pollutants from the worksite to enter the Augusta Canal, Savannah River, or designated ESAs in the South Carolina project ROW and modify the erosion control plan as directed by the Project Engineer. The Engineer in turn shall notify the State Environmental Administrator, GDOT OES at 404-631-1101. All project activities within the affected drainage area shall cease, with the exception of necessary traffic control and erosion control activities, pending consultation by the Department with the lead federal agency, USFWS, GA and SC DNRs.

18. Work activities shall be conducted from a stable canal/stream bank or reinforced platform that does not cause degradation or destabilization of the canal/stream banks.

19. Pesticides or herbicides shall not be used within 200 feet of the banks of the Augusta Canal, Savannah River, and designated ESAs in the South Carolina project ROW. Fertilizer shall only be used while grassing graded areas to achieve site stabilization.

20. In the event any incident occurs that causes harm or injury to the robust redhorse, delicate spike, Atlantic pigtoe, or Savannah lilliput in or along the Project corridor, the incident shall be reported immediately to the Project Engineer the Engineer who in turn will notify the State Environmental Administrator, GDOT OES Services at 404-631-1101. All activity within the Savannah River or on its banks, with the exception of erosion and sedimentation control and traffic control, shall cease pending consultation by the Department with the lead federal agency, USFWS, and/or GA and SC DNRs.

21. A log shall be kept detailing any incidents that cause harm or injury to robust redhorse, delicate spike, Atlantic pigtoe, or Savannah lilliput in or adjacent to the Project until such time that Project construction has been completed and time charges have stopped. Within 30 days of Project completion, the log and a report summarizing any incidents involving these species shall be submitted to the Project Engineer and to the State Environmental Administrator, GDOT OES via the Ecology Submittals Inbox (ecology_submittals@dot.ga.gov) with the PI number in the subject line of the email. The Department in turn will provide copies of the report to the lead federal agency, USFWS, GA and SC DNRs.

22. All costs pertaining to any requirement contained herein shall be included in the overall bid submitted unless such requirement is designated as a separate Pay Item in the Proposal.
Georgia Department of Transportation

Technical Provisions

For

Design-Build Agreement

P.I. No. 210327-

Attachment 6-1

UTILITY MEMORANDUMS OF UNDERSTANDING

Aiken Electric Co-op – South Carolina
Augusta Utilities – Georgia
BellSouth / AT&T Distribution – Georgia
BellSouth / AT&T Distribution – South Carolina
City of Augusta – Georgia
City of North Augusta – South Carolina
Comcast – Georgia only
Edgefield Water & Sewer – South Carolina
Georgia Power – Distribution
Georgia Power – Transmission
SCE&G – South Carolina only
Tower Cloud – South Carolina only
DESIGN-BUILD
MEMORANDUM OF UNDERSTANDING
between the
Georgia Department of Transportation (hereafter the DEPARTMENT) and
Aiken Electric CO-OP (hereafter the OWNER)

Whereas GDOT, hereafter referred to as the DEPARTMENT, proposes to undertake a design-build project, hereafter referred to as the I-20 at Savannah River PROJECT, to widen Interstate 20 and replace the Savannah River and Augusta Canal bridges in Richmond County, Georgia and Aiken County, South Carolina by contract through competitive bidding procedures; and,

Whereas the DEPARTMENT will accomplish the PROJECT through a Design Consultant, Design Consultant Team and/or Contractor, hereafter referred to as CONTRACTOR; and the utility owner hereafter referred to as the OWNER, and

Whereas, where OWNER has property rights ("Prior Rights") at the location of the PROJECT, OWNER will provide written evidence as to said prior rights within the area and will provide written documentation of prior rights relating to any individual crossing or Utility Facility, at the location of the PROJECT; and

Whereas, OWNER acknowledges that, generally, absent a showing of prior rights, the costs of relocation, protection, removal, or adjustment performed by OWNER shall be borne by OWNER; and

Whereas, pursuant to O.C.G.A. § 32-6-170(b), DEPARTMENT is authorized to pay or participate in the payment of the costs of relocation, protection, or adjustment of OWNER’S facilities where DEPARTMENT has made the determination that (i) such payments are in the best interest of the public and necessary in order to expedite the staging of the design-build project; and (ii) the costs of the removal, relocation, protection, or adjustment of such facilities are included as part of the Contract between the Department and the Department's roadway contractor for the design-build project; and

1. Type of Utility
OWNER has the following utility facilities which may need to be adjusted or relocated as a result of the proposed PROJECT:

Type of facility or facilities of OWNER:
  _____ Domestic water mains and distribution lines and associated appurtenances
  _____ Sanitary Sewer facilities and/or Storm Drainage System
  X  Electrical Distribution (overhead and underground) wires, poles, etc.
  _____ Electrical Transmission (overhead and underground) wires, poles, etc.
  _____ Natural Gas Distribution Facilities (underground)
  _____ Natural Gas Transmission Facilities (underground)
  _____ Petroleum Pipeline (underground)
  _____ Telecommunications facilities and equipment
  _____ Cable TV facilities
  _____ Street Lighting
  _____ Internet Data Service
  _____ Other Facilities (Description) _______________________________
2. New Utility Facilities Proposed (Betterment)

OWNER desires the following to be installed as new additional facilities within the PROJECT. Insert here or attach a detailed description of proposed new additional utility installations:

____________________________________________________________________________________
____________________________________________________________________________________

3. Assignment of Responsibilities for Design and Construction

This MEMORANDUM OF UNDERSTANDING and the following shall serve as a basis for assignment of responsibilities and costs for the DEPARTMENT, CONTRACTOR and the OWNER to enter into a Standard Utility Agreement (SUA) or Contract Item Agreement (CIA), if necessary, with OWNER once the PROJECT is awarded to the CONTRACTOR. For a PROJECT implementation, GDOT will not have in its possession exact costing plans to be utilized to determine exact locations of the removal, relocation, protection, or adjustment. However, Overhead/Subsurface Utility Engineering (SUE) investigations plans exist providing the best information and signifying the layout of known existing facilities. Please use these plans for developing the final determination of services as indicated below. The CONTRACTOR developed plans will be provided to the OWNER after the design build project is awarded by GDOT which shall be used by the CONTRACTOR as the final basis for the SUA or CIA. Betterment costs will be the OWNER’S responsibility.

NOTE: Water and Sewer Design and Construction relocation work put in the contract will automatically be accomplished by the DEPARTMENT’S CONTRACTOR. The UTILITY OWNER will still have design approval authority. (No Pre-Approved Contractor/Consultant List required, leave page 6 blank). If you are a Water & Sewer Utility and choose to put your relocation Design and Construction in the contract, please check Design and Construction under Option 2 under 3B. Owner’s electing to perform their own design, at their own cost, please select design under 3C.

OWNER hereby intends to:

3A. OWNER, at the DEPARTMENT’S cost through an Agreement, will provide the following services for the properties for which it has established prior rights (Check to signify):

Design     _____
Construction _____
3B. OWNER, at the CONTRACTOR’S cost, for any removal, relocation, protection, adjustment and/or design (Regardless of Prior Rights) will allow their facilities to be placed into the DEPARTMENT’S contract for the following services pursuant to O.C.G.A. § 32-6-170(b). The CONTRACTOR will add the removal, relocation, protection, materials, adjustment and/or design cost, excluding betterment, to the overall PROJECT’s cost. (Check to signify):

**Option 1:** OWNER wants the work to be performed by the OWNER’s pre-approved Design Consultants and/or Contractors.

Design _____
Construction **X**

**Option 2:** OWNER wants the DEPARTMENT’S CONTRACTOR to perform the design and/or construction. (Check to signify):

Design _____
Construction ____

If both are checked, please leave page 6 blank.

As per this section, all work necessary for the removal, relocation, protection, or adjustment of the described utilities in accordance with the plans when approved shall be included in the project contract and accomplished by the CONTRACTOR except as follows (Check none or list any work items to be performed by the OWNER)

None _____

Excluded Items
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________

Comments:
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________

3C. OWNER, at OWNER’S cost, will provide the following services (Check to signify):

Design **X**
Construction _____
The following is hereby mutually agreed to and understood by both parties:

1. The identification of existing facilities including preparation of Overhead/Subsurface Utility Engineering (SUE) investigations plans will be accomplished by the DEPARTMENT prior to award of the PROJECT and thereafter supplemented by the CONTRACTOR.

2. The CONTRACTOR shall coordinate reviews of the utility relocation information and obtain acceptance from the OWNER and DEPARTMENT when required. However, the OWNER shall apply for and obtain any required permits from the DEPARTMENT and perform any final design or proprietary design needed to administer its own relocation work if the work will not be included in the contract. If the preliminary plans indicate that no conflict exists, and the OWNER concurs with this information, the OWNER shall provide a letter of “no conflict” to the CONTRACTOR.

3. After award of the PROJECT, the CONTRACTOR will research any claimed compensable property interest for each OWNER claiming prior rights under section 3A and present the findings to the DEPARTMENT and OWNER for approval. The plans and estimate for the utility work shall be subject to approval of both the DEPARTMENT and the OWNER prior to construction. If the OWNER chooses to perform its own relocations and the OWNER holds no property interest as stated above; the OWNER shall confirm in writing that the OWNER will relocate its own facilities at no cost to the DEPARTMENT or the CONTRACTOR.

4. All construction engineering and contract supervision shall be the responsibility of the DEPARTMENT and the CONTRACTOR to ensure that all utility work included in the contract is accomplished in accordance with the PROJECT’s plans and specifications. The CONTRACTOR will consult with the OWNER before authorizing any changes or deviations which affect the OWNER’s facility.

5. For utility work included in the contract, the CONTRACTOR shall ensure that the design/construction and installation of the OWNER’S facilities is performed by a contractor/design consultant pre-approved/registered with both the DEPARTMENT and the OWNER. For any work included in the contract, excluding water and sewer, the OWNER will provide a list of pre-approved/registered contractors/design consultants on page 6 of the MOU.

6. For Utility work included in the contract, the OWNER or the OWNER’S Consultant shall have the right to visit and inspect the work at any time and advise the CONTRACTOR and the DEPARTMENT’S Engineer of any observed discrepancies or potential issues. The DEPARTMENT agrees to notify the OWNER when all utility work is completed and ready for final inspection by the OWNER.

7. Upon Maintenance Acceptance or Final Acceptance of the utility work included in the contract and upon certification by the DEPARTMENT’S Engineer and the OWNER that the work has been completed in accordance with the plans and specifications, the OWNER will accept the adjusted, relocated, and additional facilities and will thereafter operate and maintain said facilities located within the PROJECT right of way subject to the DEPARTMENT’S Utility Accommodations Policy and Standards Manual (UAM), current edition” and any agreements in effect without further cost to the DEPARTMENT or it’s CONTRACTOR. Final acceptance of the utility relocation work is accomplished by the execution of the Utility Facility Relocation Acceptance Form. The CONTRACTOR shall provide the OWNER with a complete set of “As-Built Plans” for review and approval reflecting the relocation work performed by the CONTRACTOR. Upon completion of the Utility Facility Relocation Acceptance Form and the exchange of the final OWNER approved “As-Built Plans”, the OWNER will operate and maintain the installed facilities going forward based on the date of execution of the Utility Facility Relocation Acceptance Form by the DEPARTMENT.

8. For utility coordination, relocation and reimbursement matters, the OWNER shall cooperate with the CONTRACTOR in the same manner as if coordinating directly with the DEPARTMENT in accordance with the laws of the State of Georgia, the DEPARTMENT'S UAM and any agreements in effect between the DEPARTMENT and OWNER. The OWNER agrees to cooperate in good faith with the CONTRACTOR and to respond to all requests for information or meetings required to reach a resolution of any disputed items.
9. All Utility work included in the PROJECT's contract and Utility work completed by the OWNER that is reimbursed by the DEPARTMENT through an agreement shall be in accordance with the BUY AMERICA requirements of the Federal regulations (23 U.S.C. 313 and 23 CFR 635.410) all manufacturing processes for steel and iron products or predominantly of steel or iron furnished for permanent incorporation into the work on this project shall occur in the United States. The only exception to this requirement is the production of pig iron and the processing, pelletizing and reduction of iron ore, which may occur in another country. Other than these exceptions, all melting, rolling, extruding, machining, bending, grinding, drilling, coating, etc. must occur in the United States.

a. Products of steel include, but are not limited to, such products as structural steel piles, reinforcing steel, structural plate, steel culverts, and guardrail steel supports for signs, signals and luminaires. Products of iron include, but are not limited to, such products as cast iron frames and grates and ductile iron pipe. Coatings include, but are not limited to, the applications of epoxy, galvanizing and paint. The coating material is not limited to this clause, only the application process.

b. A Certificate of Compliance shall be furnished for steel and iron products as part of the backup information with the billing. The form for this certification entitled “Buy America Certificate of Compliance” is attached to this agreement as “Exhibit A.” Records to be maintained by the Developer for this certification shall include a signed mill test report and a signed certification by each supplier, distributor, fabricator, and manufacturer that has handled the steel or iron product affirming that every process, including the application of a coating, performed on the steel or iron product has been carried out in the United States of America, except as allowed by this Section. The lack of these certifications will be justification for rejection of the steel and/or iron product or nonpayment of the work.

The requirements of said law and regulations do not prevent the use of miscellaneous steel or iron components, subcomponents and hardware necessary to encase, assemble and construct the above products, manufactured products that are not predominantly steel or iron or a minimal use of foreign steel and iron materials if the cost of such materials used does not exceed one-tenth of one percent (0.1%) of the total contract price or $2,500.00, whichever is greater. The Memorandum of Understanding will be incorporated into the project contract by reference or Exhibit.

APPROVED FOR THE OWNER BY:

[Signature]

5/17/2018

(Date)

Engineering Services Supervisor, Warren Smith

(Title)

APPROVED FOR THE DEPARTMENT BY:

[Signature]

6/7/18

(Date)

STATE UTILITIES ADMINISTRATOR

PI # 210327
Pre-Approved Contractor List

Company Name: Lee Electric
Address: Aberdeen, NC
Phone: 910-944-9728
Contact Person: 
E-Mail:

Company Name: 
Address: 
Phone: 
Contact Person: 
E-Mail:

Company Name: 
Address: 
Phone: 
Contact Person: 
E-Mail:

Please provide a minimum of three.

Pre-Approved Design Consultant List

Company Name: 
Address: 
Phone: 
Contact Person: 
E-Mail:

Company Name: 
Address: 
Phone: 
Contact Person: 
E-Mail:

Company Name: 
Address: 
Phone: 
Contact Person: 
E-Mail:
Georgia DOT Project: I-20 at Savannah River
GDOT P.I. 210327

DESIGN-BUILD
MEMORANDUM OF UNDERSTANDING
between the
Georgia Department of Transportation (hereafter the DEPARTMENT) and
City of Augusta (hereafter the OWNER)

Whereas GDOT, hereafter referred to as the DEPARTMENT, proposes to undertake a design-build project, hereafter referred to as the I-20 at Savannah River PROJECT, to widen Interstate 20 and replace the Savannah River and Augusta Canal bridges in Richmond County, Georgia and Aiken County, South Carolina by contract through competitive bidding procedures; and,

Whereas the DEPARTMENT will accomplish the PROJECT through a Design Consultant, Design Consultant Team and/or Contractor, hereafter referred to as CONTRACTOR; and the utility owner hereafter referred to as the OWNER, and

Whereas, where OWNER has property rights ("Prior Rights") at the location of the PROJECT, OWNER will provide written evidence as to said prior rights within the area and will provide written documentation of prior rights relating to any individual crossing or Utility Facility, at the location of the PROJECT; and

Whereas, OWNER acknowledges that, generally, absent a showing of prior rights, the costs of relocation, protection, removal, or adjustment performed by OWNER shall be borne by OWNER; and

Whereas, pursuant to O.C.G.A. § 32-6-170(b), DEPARTMENT is authorized to pay or participate in the payment of the costs of relocation, protection, or adjustment of OWNER'S facilities where DEPARTMENT has made the determination that (i) such payments are in the best interest of the public and necessary in order to expedite the staging of the design-build project; and (ii) the costs of the removal, relocation, protection, or adjustment of such facilities are included as part of the Contract between the Department and the Department's roadway contractor for the design-build project; and

1. Type of Utility
OWNER has the following utility facilities which may need to be adjusted or relocated as a result of the proposed PROJECT:

Type of facility or facilities of OWNER:
_____ Domestic water mains and distribution lines and associated appurtenances
_____ X Sanitary Sewer facilities and/or Storm Drainage System
_____ Electrical Distribution (overhead and underground) wires, poles, etc.
_____ Electrical Transmission (overhead and underground) wires, poles, etc.
_____ Natural Gas Distribution Facilities (underground)
_____ Natural Gas Transmission Facilities (underground)
_____ Petroleum Pipeline (underground)
_____ X Telecommunications facilities and equipment
_____ Cable TV facilities
_____ Street Lighting
_____ Internet Data Service
_____ Other Facilities (Description)
2. New Utility Facilities Proposed (Betterment)

OWNER desires the following to be installed as new additional facilities within the PROJECT. Insert here or attach a detailed description of proposed new additional utility installations:

3. Assignment of Responsibilities for Design and Construction

This MEMORANDUM OF UNDERSTANDING and the following shall serve as a basis for assignment of responsibilities and costs for the DEPARTMENT, CONTRACTOR and the OWNER to enter into a Standard Utility Agreement (SUA) or Contract Item Agreement (CIA), if necessary, with OWNER once the PROJECT is awarded to the CONTRACTOR. For a PROJECT implementation, GDOT will not have in its possession exact costing plans to be utilized to determine exact locations of the removal, relocation, protection, or adjustment. However, Overhead/Subsurface Utility Engineering (SUE) investigations plans exist providing the best information and signifying the layout of known existing facilities. Please use these plans for developing the final determination of services as indicated below. The CONTRACTOR developed plans will be provided to the OWNER after the design build project is awarded by GDOT which shall be used by the CONTRACTOR as the final basis for the SUA or CIA. Betterment costs will be the OWNER’S responsibility.

NOTE: Water and Sewer Design and Construction relocation work put in the contract will automatically be accomplished by the DEPARTMENT’S CONTRACTOR. The UTILITY OWNER will still have design approval authority. (No Pre-Approved Contractor/Consultant List required, leave page 6 blank). If you are a Water & Sewer Utility and choose to put your relocation Design and Construction in the contract, please check Design and Construction under Option 2 under 3B. Owner’s electing to perform their own design, at their own cost, please select design under 3C.

OWNER hereby intends to:

3A. OWNER, at the DEPARTMENT’S cost through an Agreement, will provide the following services for the properties for which it has established prior rights (Check to signify):

Design ______

Construction ______
3B. OWNER, at the CONTRACTOR'S cost, for any removal, relocation, protection, adjustment and/or design (Regardless of Prior Rights) will allow their facilities to be placed into the DEPARTMENT'S contract for the following services pursuant to O.C.G.A. § 32-6-170(b). The CONTRACTOR will add the removal, relocation, protection, materials, adjustment and/or design cost, excluding betterment, to the overall PROJECT's cost. (Check to signify):

Option 1: OWNER wants the work to be performed by the OWNER's pre-approved Design Consultants and/or Contractors.

Design ______
Construction ______

Option 2: OWNER wants the DEPARTMENT'S CONTRACTOR to perform the design and/or construction. (Check to signify):

Design ___
Construction ___

If both are checked, please leave page 6 blank.

As per this section, all work necessary for the removal, relocation, protection, or adjustment of the described utilities in accordance with the plans when approved shall be included in the project contract and accomplished by the CONTRACTOR except as follows (Check none or list any work items to be performed by the OWNER): None ______

Excluded Items ____________________________

______

________

Comments: __________________________

______

________

3C. OWNER, at OWNER'S cost, will provide the following services (Check to signify):

Design ______
Construction ______
The following is hereby mutually agreed to and understood by both parties:

1. The identification of existing facilities including preparation of Overhead/Subsurface Utility Engineering (SUE) investigations plans will be accomplished by the DEPARTMENT prior to award of the PROJECT and thereafter supplemented by the CONTRACTOR.

2. The CONTRACTOR shall coordinate reviews of the utility relocation information and obtain acceptance from the OWNER and DEPARTMENT when required. However, the OWNER shall apply for and obtain any required permits from the DEPARTMENT and perform any final design or proprietary design needed to administer its own relocation work if the work will not be included in the contract. If the preliminary plans indicate that no conflict exists, and the OWNER concurs with this information, the OWNER shall provide a letter of “no conflict” to the CONTRACTOR.

3. After award of the PROJECT, the CONTRACTOR will research any claimed compensable property interest for each OWNER claiming prior rights under section 3A and present the findings to the DEPARTMENT and OWNER for approval. The plans and estimate for the utility work shall be subject to approval of both the DEPARTMENT and the OWNER prior to construction. If the OWNER chooses to perform its own relocations and the OWNER holds no property interest as stated above; the OWNER shall confirm in writing that the OWNER will relocate its own facilities at no cost to the DEPARTMENT or the CONTRACTOR.

4. All construction engineering and contract supervision shall be the responsibility of the DEPARTMENT and the CONTRACTOR to ensure that all utility work included in the contract is accomplished in accordance with the PROJECT’s plans and specifications. The CONTRACTOR will consult with the OWNER before authorizing any changes or deviations which affect the OWNER’s facility.

5. For utility work included in the contract, the CONTRACTOR shall ensure that the design/construction and installation of the OWNER’S facilities is performed by a contractor/design consultant pre-approved/registered with both the DEPARTMENT and the OWNER. For any work included in the contract, excluding water and sewer, the OWNER will provide a list of pre-approved/registered contractors/design consultants on page 6 of the MOU.

6. For Utility work included in the contract, the OWNER or the OWNER’S Consultant shall have the right to visit and inspect the work at any time and advise the CONTRACTOR and the DEPARTMENT’S Engineer of any observed discrepancies or potential issues. The DEPARTMENT agrees to notify the OWNER when all utility work is completed and ready for final inspection by the OWNER.

7. Upon Maintenance Acceptance or Final Acceptance of the utility work included in the contract and upon certification by the DEPARTMENT’S Engineer and the OWNER that the work has been completed in accordance with the plans and specifications, the OWNER will accept the adjusted, relocated, and additional facilities and will thereafter operate and maintain said facilities located within the PROJECT right of way subject to the DEPARTMENT’S Utility Accommodations Policy and Standards Manual (UAM), current edition and any agreements in effect without further cost to the DEPARTMENT or its CONTRACTOR. Final acceptance of the utility relocation work is accomplished by the execution of the Utility Facility Relocation Acceptance Form. The CONTRACTOR shall provide the OWNER with a complete set of “As-Built Plans” for review and approval reflecting the relocation work performed by the CONTRACTOR. Upon completion of the Utility Facility Relocation Acceptance Form and the exchange of the final OWNER approved “As-Built Plans”, the OWNER will operate and maintain the installed facilities going forward based on the date of execution of the Utility Facility Relocation Acceptance Form by the DEPARTMENT.

8. For utility coordination, relocation and reimbursement matters, the OWNER shall cooperate with the CONTRACTOR in the same manner as if coordinating directly with the DEPARTMENT in accordance with the laws of the State of Georgia, the DEPARTMENT’S UAM and any agreements in effect between the DEPARTMENT and OWNER. The OWNER agrees to cooperate in good faith with the CONTRACTOR and to respond to all requests for information or meetings required to reach a resolution of any disputed items.
9. All Utility work included in the PROJECT’s contract and Utility work completed by the OWNER that is reimbursed by the DEPARTMENT through an agreement shall be in accordance with the BUY AMERICA requirements of the Federal regulations (23 U.S.C. 313 and 23 CFR 635.410) all manufacturing processes for steel and iron products or predominantly of steel or iron furnished for permanent incorporation into the work on this project shall occur in the United States. The only exception to this requirement is the production of pig iron and the processing, pelletizing and reduction of iron ore, which may occur in another country. Other than these exceptions, all melting, rolling, extruding, machining, bending, grinding, drilling, coating, etc. must occur in the United States.

a. Products of steel include, but are not limited to, such products as structural steel piles, reinforcing steel, structural plate, steel culverts, and guardrail steel supports for signs, signals and luminaires. Products of iron include, but are not limited to, such products as cast iron frames and grates and ductile iron pipe. Coatings include, but are not limited to, the applications of epoxy, galvanizing and paint. The coating material is not limited to this clause, only the application process.

b. A Certificate of Compliance shall be furnished for steel and iron products as part of the backup information with the billing. The form for this certification entitled “Buy America Certificate of Compliance” is attached to this agreement as “Exhibit A.” Records to be maintained by the Developer for this certification shall include a signed mill test report and a signed certification by each supplier, distributor, fabricator, and manufacturer that has handled the steel or iron product affirming that every process, including the application of a coating, performed on the steel or iron product has been carried out in the United States of America, except as allowed by this Section. The lack of these certifications will be justification for rejection of the steel and/or iron product or nonpayment of the work.

The requirements of said law and regulations do not prevent the use of miscellaneous steel or iron components, subcomponents and hardware necessary to encase, assemble and construct the above products, manufactured products that are not predominantly steel or iron or a minimal use of foreign steel and iron materials if the cost of such materials used does not exceed one-tenth of one percent (0.1%) of the total contract price or $2,500.00, whichever is greater. The Memorandum of Understanding will be incorporated into the project contract by reference or Exhibit.

APPROVED FOR THE OWNER BY:

[Signature - Mayor Hardie Davis Jr.]

[Title]

APPROVED FOR THE DEPARTMENT BY:

[Signature]

STATE UTILITIES ADMINISTRATOR

[Date]
Pre-Approved Contractor List

Company Name:
Address:
Phone:
Contact Person:
E-Mail:

Company Name:
Address:
Phone:
Contact Person:
E-Mail:

Company Name:
Address:
Phone:
Contact Person:
E-Mail:

Please provide a minimum of three.

Pre-Approved Design Consultant List

Company Name:
Address:
Phone:
Contact Person:
E-Mail:

Company Name:
Address:
Phone:
Contact Person:
E-Mail:

Company Name:
Address:
Phone:
Contact Person:
E-Mail:
Georgia DOT Project: I-20 at Savannah River  
GDOT P.I. 210327

DESIGN-BUILD  
MEMORANDUM OF UNDERSTANDING 

between the  
Georgia Department of Transportation (hereafter the DEPARTMENT)  
and  
Bellsouth Telecommunications, LLC d/b/a AT&T Georgia (hereafter the OWNER)

Whereas GDOT, hereafter referred to as the DEPARTMENT, proposes to undertake a design-build project, hereafter referred to as the I-20 at Savannah River PROJECT, to widen Interstate 20 and replace the Savannah River and Augusta Canal bridges in Richmond County, Georgia and Aiken County, South Carolina by contract through competitive bidding procedures; and,

Whereas the DEPARTMENT will accomplish the PROJECT through a Design Consultant, Design Consultant Team and/or Contractor, hereafter referred to as CONTRACTOR; and the utility owner hereafter referred to as the OWNER, and

Whereas, where OWNER has property rights ("Prior Rights") at the location of the PROJECT, OWNER will provide written evidence as to said prior rights within the area and will provide written documentation of prior rights relating to any individual crossing or Utility Facility, at the location of the PROJECT; and

Whereas, OWNER acknowledges that, generally, absent a showing of prior rights, the costs of relocation, protection, removal, or adjustment performed by OWNER shall be borne by OWNER; and

Whereas, pursuant to O.C.G.A. § 32-6-170(b), DEPARTMENT is authorized to pay or participate in the payment of the costs of relocation, protection, or adjustment of OWNER'S facilities where DEPARTMENT has made the determination that: (i) such payments are in the best interest of the public and necessary in order to expedite the staging of the design-build project; and (ii) the costs of the removal, relocation, protection, or adjustment of such facilities are included as part of the Contract between the Department and the Department's roadway contractor for the design-build project; and

1. Type of Utility  
OWNER has the following utility facilities which may need to be adjusted or relocated as a result of the proposed PROJECT:

Type of facility or facilities of OWNER:

___ Domestic water mains and distribution lines and associated appurtenances  
___ Sanitary Sewer facilities and/or Storm Drainage System  
___ Electrical Distribution (overhead and underground) wires, poles, etc.  
___ Electrical Transmission (overhead and underground) wires, poles, etc.  
___ Natural Gas Distribution Facilities (underground)  
___ Natural Gas Transmission Facilities (underground)  
___ Petroleum Pipeline (underground)  
___ Telecommunications facilities and equipment  
___ Cable TV facilities  
___ Street Lighting  
___ Internet Data Service  
___ Other Facilities (Description)
2. New Utility Facilities Proposed (Betterment)

OWNER desires the following to be installed as new additional facilities within the PROJECT. Insert here or attach a detailed description of proposed new additional utility installations:

NA

3. Assignment of Responsibilities for Design and Construction

This MEMORANDUM OF UNDERSTANDING and the following shall serve as a basis for assignment of responsibilities and costs for the DEPARTMENT, CONTRACTOR and the OWNER to enter into a Standard Utility Agreement (SUA) or Contract Item Agreement (CIA), if necessary, with OWNER once the PROJECT is awarded to the CONTRACTOR. For a PROJECT implementation, GDOT will not have in its possession exact costing plans to be utilized to determine exact locations of the removal, relocation, protection, or adjustment. However, Overhead/Subsurface Utility Engineering (SUE) investigations plans exist providing the best information and signifying the layout of known existing facilities. Please use these plans for developing the final determination of services as indicated below. The CONTRACTOR developed plans will be provided to the OWNER after the design build project is awarded by GDOT which shall be used by the CONTRACTOR as the final basis for the SUA or CIA. Betterment costs will be the OWNER’S responsibility.

NOTE: Water and Sewer Design and Construction relocation work put in the contract will automatically be accomplished by the DEPARTMENT’S CONTRACTOR. The UTILITY OWNER will still have design approval authority. (No Pre-Approved Contractor/Consultant List required, leave page 6 blank). If you are a Water & Sewer Utility and choose to put your relocation Design and Construction in the contract, please check Design and Construction under Option 2 under 3B. Owner’s electing to perform their own design, at their own cost, please select design under 3C.

OWNER hereby intends to:

3A. OWNER, at the DEPARTMENT’S cost through an Agreement, will provide the following services for the properties for which it has established prior rights (Check to signify):

Design
Construction
3B. OWNER, at the CONTRACTOR’S cost, for any removal, relocation, protection, adjustment and/or design (Regardless of Prior Rights) will allow their facilities to be placed into the DEPARTMENT’S contract for the following services pursuant to O.C.G.A. § 32-6-170(b). The CONTRACTOR will add the removal, relocation, protection, materials, adjustment and/or design cost, excluding betterment, to the overall PROJECT’S cost. (Check to signify):

**Option 1:** OWNER wants the work to be performed by the OWNER’s pre-approved Design Consultants and/or Contractors.

Design  
Construction

**Option 2:** OWNER wants the DEPARTMENT’S CONTRACTOR to perform the design and/or construction. (Check to signify):

Design  
Construction  
*If both are checked, please leave page 6 blank.*

As per this section, all work necessary for the removal, relocation, protection, or adjustment of the described utilities in accordance with the plans when approved shall be included in the project contract and accomplished by the CONTRACTOR except as follows (Check none or list any work items to be performed by the OWNER)

None

Excluded Items

Comments: While the DB Contractor will be able to perform much of the design and construction, only AT&T union personnel can pull cable/fiber, perform splicing/tie-in work, some technical design work and do pole attachments (AT&T will be responsible these cost). The DB Contractor can install any required ducts, poles and vaults/manholes/handholes, enclosures and bridge attachments and will be responsible for the cost of the design and construction (including materials). In the MOU, AT&T has selected design and construction under 3b, option 1. AT&T has also selected 3c design and construction. AT&T will be responsible for some cost as indicated above and the DB Contractor will be responsible for the remaining cost.

3C. OWNER, at OWNER’S cost, will provide the following services (Check to signify):

Design  
Construction  

PI # 210327
The following is hereby mutually agreed to and understood by both parties:

1. The identification of existing facilities including preparation of Overhead/Subsurface Utility Engineering (SUE) investigations plans will be accomplished by the DEPARTMENT prior to award of the PROJECT and thereafter supplemented by the CONTRACTOR.

2. The CONTRACTOR shall coordinate reviews of the utility relocation information and obtain acceptance from the OWNER and DEPARTMENT when required. However, the OWNER shall apply for and obtain any required permits from the DEPARTMENT and perform any final design or proprietary design needed to administer its own relocation work if the work will not be included in the contract. If the preliminary plans indicate that no conflict exists, and the OWNER concurs with this information, the OWNER shall provide a letter of “no conflict” to the CONTRACTOR.

3. After award of the PROJECT, the CONTRACTOR will research any claimed compensable property interest for each OWNER claiming prior rights under section 3A and present the findings to the DEPARTMENT and OWNER for approval. The plans and estimate for the utility work shall be subject to approval of both the DEPARTMENT and the OWNER prior to construction. If the OWNER chooses to perform its own relocations and the OWNER holds no property interest as stated above; the OWNER shall confirm in writing that the OWNER will relocate its own facilities at no cost to the DEPARTMENT or the CONTRACTOR.

4. All construction engineering and contract supervision shall be the responsibility of the DEPARTMENT and the CONTRACTOR to ensure that all utility work included in the contract is accomplished in accordance with the PROJECT’s plans and specifications. The CONTRACTOR will consult with the OWNER before authorizing any changes or deviations which affect the OWNER’s facility.

5. For utility work included in the contract, the CONTRACTOR shall ensure that the design/construction and installation of the OWNER’S facilities is performed by a contractor/design consultant pre-approved/registered with both the DEPARTMENT and the OWNER. For any work included in the contract, excluding water and sewer, the OWNER will provide a list of pre-approved/registered contractors/design consultants on page 6 of the MOU.

6. For Utility work included in the contract, the OWNER or the OWNER’S Consultant shall have the right to visit and inspect the work at any time and advise the CONTRACTOR and the DEPARTMENT’S Engineer of any observed discrepancies or potential issues. The DEPARTMENT agrees to notify the OWNER when all utility work is completed and ready for final inspection by the OWNER.

7. Upon Maintenance Acceptance or Final Acceptance of the utility work included in the contract and upon certification by the DEPARTMENT’S Engineer and the OWNER that the work has been completed in accordance with the plans and specifications, the OWNER will accept the adjusted, relocated, and additional facilities and will thereafter operate and maintain said facilities located within the PROJECT right of way subject to the DEPARTMENT’S Utility Accommodations Policy and Standards Manual (UAM), current edition” and any agreements in effect without further cost to the DEPARTMENT or it’s CONTRACTOR. Final acceptance of the utility relocation work is accomplished by the execution of the Utility Facility Relocation Acceptance Form. The CONTRACTOR shall provide the OWNER with a complete set of “As-Built Plans” for review and approval reflecting the relocation work performed by the CONTRACTOR. Upon completion of the Utility Facility Relocation Acceptance Form and the exchange of the final OWNER approved “As-Built Plans”, the OWNER will operate and maintain the installed facilities going forward based on the date of execution of the Utility Facility Relocation Acceptance Form by the DEPARTMENT.

8. For utility coordination, relocation and reimbursement matters, the OWNER shall cooperate with the CONTRACTOR in the same manner as if coordinating directly with the DEPARTMENT in accordance with the laws of the State of Georgia, the DEPARTMENT’S UAM and any agreements in effect between the
DEPARTMENT and OWNER. The OWNER agrees to cooperate in good faith with the CONTRACTOR and to respond to all requests for information or meetings required to reach a resolution of any disputed items.

All Utility work included in the PROJECT's contract and Utility work completed by the OWNER that is reimbursed by the DEPARTMENT through an agreement shall be in accordance with the BUY AMERICA requirements of the Federal regulations (23 U.S.C. 313 and 23 CFR 635.410) all manufacturing processes for steel and iron products or predominantly of steel or iron furnished for permanent incorporation into the work on this project shall occur in the United States. The only exception to this requirement is the production of pig iron and the processing, pelletizing and reduction of iron ore, which may occur in another country. Other than these exceptions, all melting, rolling, extruding, machining, bending, grinding, drilling, coating, etc. must occur in the United States.

a. Products of steel include, but are not limited to, such products as structural steel piles, reinforcing steel, structural plate, steel culverts, and guardrail steel supports for signs, signals and luminaires. Products of iron include, but are not limited to, such products as cast iron frames and grates and ductile iron pipe. Coatings include, but are not limited to, the applications of epoxy, galvanizing and paint. The coating material is not limited to this clause, only the application process.

b. A Certificate of Compliance shall be furnished for steel and iron products as part of the backup information with the billing. The form for this certification entitled “Buy America Certificate of Compliance” is attached to this agreement as “Exhibit A.” Records to be maintained by the Developer for this certification shall include a signed mill test report and a signed certification by each supplier, distributor, fabricator, and manufacturer that has handled the steel or iron product affirming that every process, including the application of a coating, performed on the steel or iron product has been carried out in the United States of America, except as allowed by this Section. The lack of these certifications will be justification for rejection of the steel and/or iron product or nonpayment of the work.

The requirements of said law and regulations do not prevent the use of miscellaneous steel or iron components, subcomponents and hardware necessary to encase, assemble and construct the above products, manufactured products that are not predominantly steel or iron or a minimal use of foreign steel and iron materials if the cost of such materials used does not exceed one-tenth of one percent (0.1%) of the total contract price or $2,500.00, whichever is greater. The Memorandum of Understanding will be incorporated into the project contract by reference or Exhibit.

APPROVED FOR THE OWNER BY:

[Signature]
(Date)

DESIGN RESOURCE MANAGER

[Title]

APPROVED FOR THE DEPARTMENT BY:

[Signature]
(Date)

STATE UTILITIES ADMINISTRATOR
Pre-Approved Contractor List

Company Name:  
Address:  
Phone:  
Contact Person:  
E-Mail:  

Company Name:  
Address:  
Phone:  
Contact Person:  
E-Mail:  

Company Name:  
Address:  
Phone:  
Contact Person:  
E-Mail:  

Please provide a minimum of three.

Pre-Approved Design Consultant List

Company Name:  Regional Telecom Services Associates, LLC  
Address:  188 Hurricane Shoals Rd NE  Lawrenceville, Ga  30046  
Phone:  770-270-1212  
Contact Person:  Mike Griesel  
E-Mail:  MG8122@ATT.COM

Company Name:  Source One Corporation  
Address:  1700 Waukegan Rd Suite 100  Atlanta, Ga  30339  
Phone:  678-594-5100  
Contact Person:  Beejee McGinty  
E-Mail:  beejee@sourceonecorp.com

Company Name:  
Address:  
Phone:  
Contact Person:  
E-Mail:  

PL # 214527
Georgia DOT Project: I-20 at Savannah River
GDOT P.I. 210327

DESIGN-BUILD
MEMORANDUM OF UNDERSTANDING
between the
Georgia Department of Transportation (hereafter the DEPARTMENT)
and
Bellsouth Telecommunications, LLC d/b/a AT&T South Carolina (hereafter the OWNER)

Whereas GDOT, hereafter referred to as the DEPARTMENT, proposes to undertake a design-build project, hereafter referred to as the I-20 at Savannah River PROJECT, to widen Interstate 20 and replace the Savannah River and Augusta Canal bridges in Richmond County, Georgia and Aiken County, South Carolina by contract through competitive bidding procedures; and,

Whereas the DEPARTMENT will accomplish the PROJECT through a Design Consultant, Design Consultant Team and/or Contractor, hereafter referred to as CONTRACTOR; and the utility owner hereafter referred to as the OWNER, and

Whereas, where OWNER has property rights ("Prior Rights") at the location of the PROJECT, OWNER will provide written evidence as to said prior rights within the area and will provide written documentation of prior rights relating to any individual crossing or Utility Facility, at the location of the PROJECT; and

Whereas, OWNER acknowledges that, generally, absent a showing of prior rights, the costs of relocation, protection, removal, or adjustment performed by OWNER shall be borne by OWNER; and

Whereas, pursuant to O.C.G.A. § 32-6-170(b), DEPARTMENT is authorized to pay or participate in the payment of the costs of relocation, protection, or adjustment of OWNER’S facilities where DEPARTMENT has made the determination that (i) such payments are in the best interest of the public and necessary in order to expedite the staging of the design-build project; and (ii) the costs of the removal, relocation, protection, or adjustment of such facilities are included as part of the Contract between the Department and the Department’s roadway contractor for the design-build project; and

1. Type of Utility
OWNER has the following utility facilities which may need to be adjusted or relocated as a result of the proposed PROJECT:

Type of facility or facilities of OWNER:
   _____ Domestic water mains and distribution lines and associated appurtenances
   _____ Sanitary Sewer facilities and/or Storm Drainage System
   _____ Electrical Distribution (overhead and underground) wires, poles, etc.
   _____ Electrical Transmission (overhead and underground) wires, poles, etc.
   _____ Natural Gas Distribution Facilities (underground)
   _____ Natural Gas Transmission Facilities (underground)
   _____ Petroleum Pipeline (underground)
   _____ Telecommunications facilities and equipment
   _____ Cable TV facilities
   _____ Street Lighting
   _____ Internet Data Service
   _____ Other Facilities (Description)
2. New Utility Facilities Proposed (Betterment)

OWNER desires the following to be installed as new additional facilities within the PROJECT. Insert here or attach a detailed description of proposed new additional utility installations:

NA

3. Assignment of Responsibilities for Design and Construction

This MEMORANDUM OF UNDERSTANDING and the following shall serve as a basis for assignment of responsibilities and costs for the DEPARTMENT, CONTRACTOR and the OWNER to enter into a Standard Utility Agreement (SUA) or Contract Item Agreement (CIA), if necessary, with OWNER once the PROJECT is awarded to the CONTRACTOR. For a PROJECT implementation, GDOT will not have in its possession exact costing plans to be utilized to determine exact locations of the removal, relocation, protection, or adjustment. However, Overhead/Subsurface Utility Engineering (SUE) investigations plans exist providing the best information and signifying the layout of known existing facilities. Please use these plans for developing the final determination of services as indicated below. The CONTRACTOR developed plans will be provided to the OWNER after the design build project is awarded by GDOT which shall be used by the CONTRACTOR as the final basis for the SUA or CIA. Betterment costs will be the OWNER’S responsibility.

NOTE: Water and Sewer Design and Construction relocation work put in the contract will automatically be accomplished by the DEPARTMENT’S CONTRACTOR. The UTILITY OWNER will still have design approval authority. (No Pre-Approved Contractor/Consultant List required, leave page 6 blank). If you are a Water & Sewer Utility and choose to put your relocation Design and Construction in the contract, please check Design and Construction under Option 2 under 3B. Owner’s electing to perform their own design, at their own cost, please select design under 3C.

OWNER hereby intends to:

3A. OWNER, at the DEPARTMENT’S cost through an Agreement, will provide the following services for the properties for which it has established prior rights (Check to signify):

Design  
Construction  

PI # 210327
3B. OWNER, at the CONTRACTOR’S cost, for any removal, relocation, protection, adjustment and/or cesign (Regardless of Prior Rights) will allow their facilities to be placed into the DEPARTMENT’S contract for the following services pursuant to O.C.G.A. § 32-6-170(b). The CONTRACTOR will add the removal, relocation, protection, materials, adjustment and/or design cost, excluding betterment, to the overall PROJECT’S cost. (Check to signify):

Option 1: OWNER wants the work to be performed by the OWNER’s pre-approved Design Consultants and/or Contractors.

Design  X
Construction  X

Option 2: OWNER wants the DEPARTMENT’S CONTRACTOR to perform the design and/or construction. (Check to signify):

Design  
Construction  X  If both are checked, please leave page 6 blank.

As per this section, all work necessary for the removal, relocation, protection, or adjustment of the described utilities in accordance with the plans when approved shall be included in the project contract and accomplished by the CONTRACTOR except as follows (Check none or list any work items to be performed by the OWNER)

None  

Excluded Items  

Comments: While the DB Contractor will be able to perform much of the design and construction, only AT&T union personnel can pull cable/fiber, perform splicing/tie-in work, some technical design work and do pole attachments (AT&T will be responsible these cost). The DB Contractor can install any required ducts, poles and vaults/manholes/handholes, enclosures and bridge attachments and will be responsible for the cost of the design and construction (including materials). In the MOU, AT&T has selected design and construction under 3b, option 1. AT&T has also selected 3c design and construction. AT&T will be responsible for some cost as indicated above and the DB Contractor will be responsible for the remaining cost.

3C. OWNER, at OWNER’S cost, will provide the following services (Check to signify):

Design  X
Construction  X
The following is hereby mutually agreed to and understood by both parties:

1. The identification of existing facilities including preparation of Overhead/Subsurface Utility Engineering (SUE) investigations plans will be accomplished by the DEPARTMENT prior to award of the PROJECT and thereafter supplemented by the CONTRACTOR.

2. The CONTRACTOR shall coordinate reviews of the utility relocation information and obtain acceptance from the OWNER and DEPARTMENT when required. However, the OWNER shall apply for and obtain any required permits from the DEPARTMENT and perform any final design or proprietary design needed to administer its own relocation work if the work will not be included in the contract. If the preliminary plans indicate that no conflict exists, and the OWNER consents with this information, the OWNER shall provide a letter of "no conflict" to the CONTRACTOR.

3. After award of the PROJECT, the CONTRACTOR will research any claimed compensable property interest for each OWNER claiming prior rights under section 3A and present the findings to the DEPARTMENT and OWNER for approval. The plans and estimate for the utility work shall be subject to approval of both the DEPARTMENT and the OWNER prior to construction. If the OWNER chooses to perform its own relocations and the OWNER holds no property interest as stated above; the OWNER shall confirm in writing that the OWNER will relocate its own facilities at no cost to the DEPARTMENT or the CONTRACTOR.

4. All construction engineering and contract supervision shall be the responsibility of the DEPARTMENT and the CONTRACTOR to ensure that all utility work included in the contract is accomplished in accordance with the PROJECT’s plans and specifications. The CONTRACTOR will consult with the OWNER before authorizing any changes or deviations which affect the OWNER’s facility.

5. For utility work included in the contract, the CONTRACTOR shall ensure that the design/construction and installation of the OWNER’S facilities is performed by a contractor/design consultant pre-approved/registered with both the DEPARTMENT and the OWNER. For any work included in the contract, excluding water and sewer, the OWNER will provide a list of pre-approved/registered contractors/design consultants on page 6 of the MOU.

6. For Utility work included in the contract, the OWNER or the OWNER’s Consultant shall have the right to visit and inspect the work at any time and advise the CONTRACTOR and the DEPARTMENT’S Engineer of any observed discrepancies or potential issues. The DEPARTMENT agrees to notify the OWNER when all utility work is completed and ready for final inspection by the OWNER.

7. Upon Maintenance Acceptance or Final Acceptance of the utility work included in the contract and upon certification by the DEPARTMENT’S Engineer and the OWNER that the work has been completed in accordance with the plans and specifications, the OWNER will accept the adjusted, relocated, and additional facilities and will thereafter operate and maintain said facilities located within the PROJECT right of way subject to the DEPARTMENT’S Utility Accommodations Policy and Standards Manual (UAM), current edition and any agreements in effect without further cost to the DEPARTMENT or it’s CONTRACTOR. Final acceptance of the utility relocation work is accomplished by the execution of the Utility Facility Relocation Acceptance Form. The CONTRACTOR shall provide the OWNER with a complete set of “As-Built Plans” for review and approval reflecting the relocation work performed by the CONTRACTOR. Upon completion of the Utility Facility Relocation Acceptance Form and the exchange of the final OWNER approved “As-Built Plans”, the OWNER will operate and maintain the installed facilities going forward based on the date of execution of the Utility Facility Relocation Acceptance Form by the DEPARTMENT.

8. For utility coordination, relocation and reimbursement matters, the OWNER shall cooperate with the CONTRACTOR in the same manner as if coordinating directly with the DEPARTMENT in accordance with the laws of the State of Georgia, the DEPARTMENT’S UAM and any agreements in effect between the
DEPARTMENT and OWNER. The OWNER agrees to cooperate in good faith with the CONTRACTOR and to respond to all requests for information or meetings required to reach a resolution of any disputed items.

9. All Utility work included in the PROJECT’s contract and Utility work completed by the OWNER that is reimbursed by the DEPARTMENT through an agreement shall be in accordance with the BUY AMERICA requirements of the Federal regulations (23 U.S.C. 313 and 23 CFR 635.410) all manufacturing processes for steel and iron products or predominately of steel or iron furnished for permanent incorporation into the work on this project shall occur in the United States. The only exception to this requirement is the production of pig iron and the processing, pelletizing and reduction of iron ore, which may occur in another country. Other than these exceptions, all melting, rolling, extruding, machining, bending, grinding, drilling, coating, etc. must occur in the United States.

a. Products of steel include, but are not limited to, such products as structural steel piles, reinforcing steel, structural plate, steel culverts, and guardrail steel supports for signs, signals and luminaires. Products of iron include, but are not limited to, such products as cast iron frames and grates and ductile iron pipe. Coatings include, but are not limited to, the applications of epoxy, galvanizing and paint. The coating material is not limited to this clause, only the application process.

b. A Certificate of Compliance shall be furnished for steel and iron products as part of the backup information with the billing. The form for this certification entitled “Buy America Certificate of Compliance” is attached to this agreement as “Exhibit A.” Records to be maintained by the Developer for this certification shall include a signed mill test report and a signed certification by each supplier, distributor, fabricator, and manufacturer that has handled the steel or iron product affirming that every process, including the application of a coating, performed on the steel or iron product has been carried out in the United States of America, except as allowed by this Section. The lack of these certifications will be justification for rejection of the steel and/or iron product or nonpayment of the work.

The requirements of said law and regulations do not prevent the use of miscellaneous steel or iron components, subcomponents and hardware necessary to encase, assemble and construct the above products, manufactured products that are not predominantly steel or iron or a minimal use of foreign steel and iron materials if the cost of such materials used does not exceed one-tenth of one percent (0.1%) of the total contract price or $2,500.00, whichever is greater. The Memorandum of Understanding will be incorporated into the project contract by reference or Exhibit.

APPROVED FOR THE OWNER BY:  

[Signature]  

5/30/18  

(Date)

[Title]

APPROVED FOR THE DEPARTMENT BY:  

[Signature]  

6/7/18  

(Date)

STATE UTILITIES ADMINISTRATOR

PI # 210327
Pre-Approved Contractor List

Company Name: ANSCO
Address: 1025 Richland Ave., Aiken SC. 29801
Phone: 803-643-9691
Contact Person: Charles Burnett
E-Mail: Charles.burnett@anscolle.com

Please provide a minimum of three.

Pre-Approved Design Consultant List

Company Name:
Address:
Phone:
Contact Person:
E-Mail:

Company Name:
Address:
Phone:
Contact Person:
E-Mail:

Company Name:
Address:
Phone:
Contact Person:
E-Mail:

PI # 210327
Georgia DOT Project: I-20 at Savannah River  
GDOT P.I. 210327

DESIGN-BUILD  
MEMORANDUM OF UNDERSTANDING  
between the  
Georgia Department of Transportation (hereafter the DEPARTMENT)  
and  
City of North Augusta (hereafter the OWNER)

Whereas GDOT, hereafter referred to as the DEPARTMENT, proposes to undertake a design-build project, hereafter referred to as the I-20 at Savannah River PROJECT, to widen Interstate 20 and replace the Savannah River and Augusta Canal bridges in Richmond County, Georgia and Aiken County, South Carolina by contract through competitive bidding procedures; and,

Whereas the DEPARTMENT will accomplish the PROJECT through a Design Consultant, Design Consultant Team and/or Contractor, hereafter referred to as CONTRACTOR; and the utility owner hereafter referred to as the OWNER, and

Whereas, where OWNER has property rights ("Prior Rights") at the location of the PROJECT, OWNER will provide written evidence as to said prior rights within the area and will provide written documentation of prior rights relating to any individual crossing or Utility Facility, at the location of the PROJECT; and

Whereas, OWNER acknowledges that, generally, absent a showing of prior rights, the costs of relocation, protection, removal, or adjustment performed by OWNER shall be borne by OWNER; and

Whereas, pursuant to O.C.G.A. § 32-6-170(b), DEPARTMENT is authorized to pay or participate in the payment of the costs of relocation, protection, or adjustment of OWNER'S facilities where DEPARTMENT has made the determination that (i) such payments are in the best interest of the public and necessary in order to expedite the staging of the design-build project; and (ii) the costs of the removal, relocation, protection, or adjustment of such facilities are included as part of the Contract between the Department and the Department's roadway contractor for the design-build project; and

1. Type of Utility
OWNER has the following utility facilities which may need to be adjusted or relocated as a result of the proposed PROJECT:

Type of facility or facilities of OWNER:

- [X] Domestic water mains and distribution lines and associated appurtenances
- [X] Sanitary Sewer facilities and/or Storm Drainage System
- [ ] Electrical Distribution (overhead and underground) wires, poles, etc.
- [ ] Electrical Transmission (overhead and underground) wires, poles, etc.
- [ ] Natural Gas Distribution Facilities (underground)
- [ ] Natural Gas Transmission Facilities (underground)
- [ ] Petroleum Pipeline (underground)
- [ ] Telecommunications facilities and equipment
- [ ] Cable TV facilities
- [ ] Street Lighting
- [ ] Internet Data Service
- [ ] Other Facilities (Description)
2. New Utility Facilities Proposed (Betterment)

OWNER desires the following to be installed as new additional facilities within the PROJECT. Insert here or attach a detailed description of proposed new additional utility installations:

---

3. Assignment of Responsibilities for Design and Construction

This MEMORANDUM OF UNDERSTANDING and the following shall serve as a basis for assignment of responsibilities and costs for the DEPARTMENT, CONTRACTOR and the OWNER to enter into a Standard Utility Agreement (SUA) or Contract Item Agreement (CIA), if necessary, with OWNER once the PROJECT is awarded to the CONTRACTOR. For a PROJECT implementation, GDOT will not have in its possession exact costing plans to be utilized to determine exact locations of the removal, relocation, protection, or adjustment. However, Overhead/Subsurface Utility Engineering (SUE) investigations plans exist providing the best information and signifying the layout of known existing facilities. Please use these plans for developing the final determination of services as indicated below. The CONTRACTOR developed plans will be provided to the OWNER after the design build project is awarded by GDOT which shall be used by the CONTRACTOR as the final basis for the SUA or CIA. Betterment costs will be the OWNER’S responsibility.

NOTE: Water and Sewer Design and Construction relocation work put in the contract will automatically be accomplished by the DEPARTMENT’S CONTRACTOR. The UTILITY OWNER will still have design approval authority. (No Pre-Approved Contractor/Consultant List required, leave page 6 blank). If you are a Water & Sewer Utility and choose to put your relocation Design and Construction in the contract, please check Design and Construction under Option 2 under 3B. Owner’s electing to perform their own design, at their own cost, please select design under 3C.

OWNER hereby intends to:

3A. OWNER, at the DEPARTMENT’S cost through an Agreement, will provide the following services for the properties for which it has established prior rights (Check to signify):

   Design
   Construction
3B. OWNER, at the CONTRACTOR’S cost, for any removal, relocation, protection, adjustment and/or design (Regardless of Prior Rights) will allow their facilities to be placed into the DEPARTMENT’S contract for the following services pursuant to O.C.G.A. § 32-6-170(b). The CONTRACTOR will add the removal, relocation, protection, materials, adjustment and/or design cost, excluding betterment, to the overall PROJECT’S cost. (Check to signify):

**Option 1:** OWNER wants the work to be performed by the OWNER’s pre-approved Design Consultants and/or Contractors.

Design ______
Construction ______

**Option 2:** OWNER wants the DEPARTMENT’S CONTRACTOR to perform the design and/or construction. (Check to signify):

Design _X__
Construction _X__  **If both are checked, please leave page 6 blank.**

As per this section, all work necessary for the removal, relocation, protection, or adjustment of the described utilities in accordance with the plans when approved shall be included in the project contract and accomplished by the CONTRACTOR except as follows (Check none or list any work items to be performed by the OWNER)

None ______

Excluded Items ________________________________________________________________

Comments:

_________________________________________________________________________

_________________________________________________________________________

_________________________________________________________________________

_________________________________________________________________________

3C. OWNER, at OWNER’S cost, will provide the following services (Check to signify):

Design ______
Construction ______

PI # 210327
The following is hereby mutually agreed to and understood by both parties:

1. The identification of existing facilities including preparation of Overhead/Subsurface Utility Engineering (SUE) investigations plans will be accomplished by the DEPARTMENT prior to award of the PROJECT and thereafter supplemented by the CONTRACTOR.

2. The CONTRACTOR shall coordinate reviews of the utility relocation information and obtain acceptance from the OWNER and DEPARTMENT when required. However; the OWNER shall apply for and obtain any required permits from the DEPARTMENT and perform any final design or proprietary design needed to administer its own relocation work if the work will not be included in the contract. If the preliminary plans indicate that no conflict exists, and the OWNER concurs with this information, the OWNER shall provide a letter of “no conflict” to the CONTRACTOR.

3. After award of the PROJECT, the CONTRACTOR will research any claimed compensable property interest for each OWNER claiming prior rights under section 3A and present the findings to the DEPARTMENT and OWNER for approval. The plans and estimate for the utility work shall be subject to approval of both the DEPARTMENT and the OWNER prior to construction. If the OWNER chooses to perform its own relocations and the OWNER holds no property interest as stated above; the OWNER shall confirm in writing that the OWNER will relocate its own facilities at no cost to the DEPARTMENT or the CONTRACTOR.

4. All construction engineering and contract supervision shall be the responsibility of the DEPARTMENT and the CONTRACTOR to ensure that all utility work included in the contract is accomplished in accordance with the PROJECT’s plans and specifications. The CONTRACTOR will consult with the OWNER before authorizing any changes or deviations which affect the OWNER’s facility.

5. For utility work included in the contract, the CONTRACTOR shall ensure that the design/construction and installation of the OWNER’S facilities is performed by a contractor/design consultant pre-approved/registered with both the DEPARTMENT and the OWNER. For any work included in the contract, excluding water and sewer, the OWNER will provide a list of pre-approved/registered contractors/design consultants on page 6 of the MOU.

6. For Utility work included in the contract, the OWNER or the OWNER’s Consultant shall have the right to visit and inspect the work at any time and advise the CONTRACTOR and the DEPARTMENT’S Engineer of any observed discrepancies or potential issues. The DEPARTMENT agrees to notify the OWNER when all utility work is completed and ready for final inspection by the OWNER.

7. Upon Maintenance Acceptance or Final Acceptance of the utility work included in the contract and upon certification by the DEPARTMENT’S Engineer and the OWNER that the work has been completed in accordance with the plans and specifications, the OWNER will accept the adjusted, relocated, and additional facilities and will thereafter operate and maintain said facilities located within the PROJECT right of way subject to the DEPARTMENT’S Utility Accommodations Policy and Standards Manual (UAM), current edition” and any agreements in effect without further cost to the DEPARTMENT or it’s CONTRACTOR. Final acceptance of the utility relocation work is accomplished by the execution of the Utility Facility Relocation Acceptance Form. The CONTRACTOR shall provide the OWNER with a complete set of “As-Built Plans” for review and approval reflecting the relocation work performed by the CONTRACTOR. Upon completion of the Utility Facility Relocation Acceptance Form and the exchange of the final OWNER approved “As-Built Plans”, the OWNER will operate and maintain the installed facilities going forward based on the date of execution of the Utility Facility Relocation Acceptance Form by the DEPARTMENT.

8. For utility coordination, relocation and reimbursement matters, the OWNER shall cooperate with the CONTRACTOR in the same manner as if coordinating directly with the DEPARTMENT in accordance with the laws of the State of Georgia, the DEPARTMENT’S UAM and any agreements in effect between the DEPARTMENT and OWNER. The OWNER agrees to cooperate in good faith with the CONTRACTOR and to respond to all requests for information or meetings required to reach a resolution of any disputed items.
9. All Utility work included in the PROJECT’s contract and Utility work completed by the OWNER that is reimbursed by the DEPARTMENT through an agreement shall be in accordance with the BUY AMERICA requirements of the Federal regulations (23 U.S.C. 313 and 23 CFR 635.410) all manufacturing processes for steel and iron products or predominantly of steel or iron furnished for permanent incorporation into the work on this project shall occur in the United States. The only exception to this requirement is the production of pig iron and the processing, pelletizing and reduction of iron ore, which may occur in another country. Other than these exceptions, all melting, rolling, extruding, machining, bending, grinding, drilling, coating, etc. must occur in the United States.

a. Products of steel include, but are not limited to, such products as structural steel piles, reinforcing steel, structural plate, steel culverts, and guardrail steel supports for signs, signals and luminaires. Products of iron include, but are not limited to, such products as cast iron frames and grates and ductile iron pipe. Coatings include, but are not limited to, the applications of epoxy, galvanizing and paint. The coating material is not limited to this clause, only the application process.

b. A Certificate of Compliance shall be furnished for steel and iron products as part of the backup information with the billing. The form for this certification entitled “Buy America Certificate of Compliance” is attached to this agreement as “Exhibit A.” Records to be maintained by the Developer for this certification shall include a signed mill test report and a signed certification by each supplier, distributor, fabricator, and manufacturer that has handled the steel or iron product affirming that every process, including the application of a coating, performed on the steel or iron product has been carried out in the United States of America, except as allowed by this Section. The lack of these certifications will be justification for rejection of the steel and/or iron product or nonpayment of the work.

The requirements of said law and regulations do not prevent the use of miscellaneous steel or iron components, subcomponents and hardware necessary to encase, assemble and construct the above products, manufactured products that are not predominantly steel or iron or a minimal use of foreign steel and iron materials if the cost of such materials used does not exceed one-tenth of one percent (0.1%) of the total contract price or $2,500.00, whichever is greater. The Memorandum of Understanding will be incorporated into the project contract by reference or Exhibit.

APPROVED FOR THE OWNER BY:

B. Jayel De

(Signature)

CITY ADMINISTRATOR

(Title)

APPROVED FOR THE DEPARTMENT BY:

[Signature]

(Date)

6/4/18

STATE UTILITIES ADMINISTRATOR

6/7/18
Pre-Approved Contractor List

Company Name:
Address:
Phone:
Contact Person:
E-Mail:

Company Name:
Address:
Phone:
Contact Person:
E-Mail:

Company Name:
Address:
Phone:
Contact Person:
E-Mail:

Please provide a minimum of three.

Pre-Approved Design Consultant List

Company Name:
Address:
Phone:
Contact Person:
E-Mail:

Company Name:
Address:
Phone:
Contact Person:
E-Mail:

Company Name:
Address:
Phone:
Contact Person:
E-Mail:
Georgia DOT Project: I-20 at Savannah River  
GDOT P.I. 210327

DESIGN-BUILD  
MEMORANDUM OF UNDERSTANDING  
between the  
Georgia Department of Transportation (hereafter the DEPARTMENT)  
and  
Comcast (hereafter the OWNER)

Whereas GDOT, hereafter referred to as the DEPARTMENT, proposes to undertake a design-build project, hereafter referred to as the I-20 at Savannah River PROJECT, to widen Interstate 20 and replace the Savannah River and Augusta Canal bridges in Richmond County, Georgia and Aiken County, South Carolina by contract through competitive bidding procedures; and,

Whereas the DEPARTMENT will accomplish the PROJECT through a Design Consultant, Design Consultant Team and/or Contractor, hereafter referred to as CONTRACTOR; and the utility owner hereafter referred to as the OWNER, and

Whereas, where OWNER has property rights (“Prior Rights”) at the location of the PROJECT, OWNER will provide written evidence as to said prior rights within the area and will provide written documentation of prior rights relating to any individual crossing or Utility Facility, at the location of the PROJECT; and

Whereas, OWNER acknowledges that, generally, absent a showing of prior rights, the costs of relocation, protection, removal, or adjustment performed by OWNER shall be borne by OWNER; and

Whereas, pursuant to O.C.G.A. § 32-6-170(b), DEPARTMENT is authorized to pay or participate in the payment of the costs of relocation, protection, or adjustment of OWNER’S facilities where DEPARTMENT has made the determination that (i) such payments are in the best interest of the public and necessary in order to expedite the staging of the design-build project; and (ii) the costs of the removal, relocation, protection, or adjustment of such facilities are included as part of the Contract between the Department and the Department's roadway contractor for the design-build project; and

1. Type of Utility

OWNER has the following utility facilities which may need to be adjusted or relocated as a result of the proposed PROJECT:

Type of facility or facilities of OWNER:
  _____ Domestic water mains and distribution lines and associated appurtenances
  _____ Sanitary Sewer facilities and/or Storm Drainage System
  _____ Electrical Distribution (overhead and underground) wires, poles, etc.
  _____ Electrical Transmission (overhead and underground) wires, poles, etc.
  _____ Natural Gas Distribution Facilities (underground)
  _____ Natural Gas Transmission Facilities (underground)
  _____ Petroleum Pipeline (underground)
  _____ Telecommunications facilities and equipment
  ___ Cable TV facilities
  _____ Street Lighting
  _____ Internet Data Service
  _____ Other Facilities (Description) _____________________________________
2. New Utility Facilities Proposed (Betterment)

OWNER desires the following to be installed as new additional facilities within the PROJECT. Insert here or attach a detailed description of proposed new additional utility installations:

NA

3. Assignment of Responsibilities for Design and Construction

This MEMORANDUM OF UNDERSTANDING and the following shall serve as a basis for assignment of responsibilities and costs for the DEPARTMENT, CONTRACTOR and the OWNER to enter into a Standard Utility Agreement (SUA) or Contract Item Agreement (CIA), if necessary, with OWNER once the PROJECT is awarded to the CONTRACTOR. For a PROJECT implementation, GDOT will not have in its possession exact costing plans to be utilized to determine exact locations of the removal, relocation, protection, or adjustment. However, Overhead/Subsurface Utility Engineering (SUE) investigations plans exist providing the best information and signifying the layout of known existing facilities. Please use these plans for developing the final determination of services as indicated below. The CONTRACTOR developed plans will be provided to the OWNER after the design build project is awarded by GDOT which shall be used by the CONTRACTOR as the final basis for the SUA or CIA. Betterment costs will be the OWNER’S responsibility.

NOTE: Water and Sewer Design and Construction relocation work put in the contract will automatically be accomplished by the DEPARTMENT’S CONTRACTOR. The UTILITY OWNER will still have design approval authority. (No Pre-Approved Contractor/Consultant List required, leave page 6 blank). If you are a Water & Sewer Utility and choose to put your relocation Design and Construction in the contract, please check Design and Construction under Option 2 under 3B. Owner’s electing to perform their own design, at their own cost, please select design under 3C.

OWNER hereby intends to:

3A. OWNER, at the DEPARTMENT’S cost through an Agreement, will provide the following services for the properties for which it has established prior rights (Check to signify):

Design  _____
Construction  _____
3B. OWNER, at the CONTRACTOR’S cost, for any removal, relocation, protection, adjustment and/or design (Regardless of Prior Rights) will allow their facilities to be placed into the DEPARTMENT’S contract for the following services pursuant to O.C.G.A. § 32-6-170(b). The CONTRACTOR will add the removal, relocation, protection, materials, adjustment and/or design cost, excluding betterment, to the overall PROJECT’s cost. (Check to signify):

Option 1: OWNER wants the work to be performed by the OWNER’s pre-approved Design Consultants and/or Contractors.

Design  X  
Construction  X

Option 2: OWNER wants the DEPARTMENT’S CONTRACTOR to perform the design and/or construction. (Check to signify):

Design  
Construction  
If both are checked, please leave page 6 blank.

As per this section, all work necessary for the removal, relocation, protection, or adjustment of the described utilities in accordance with the plans when approved shall be included in the project contract and accomplished by the CONTRACTOR except as follows (Check none or list any work items to be performed by the OWNER)

None _____

Excluded Items
______________________________________________________________________________
______________________________________________________________________________

Comments:
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________

3C. OWNER, at OWNER’S cost, will provide the following services (Check to signify):

Design  
Construction  ____
The following is hereby mutually agreed to and understood by both parties:

1. The identification of existing facilities including preparation of Overhead/Subsurface Utility Engineering (SUE) investigations plans will be accomplished by the DEPARTMENT prior to award of the PROJECT and thereafter supplemented by the CONTRACTOR.

2. The CONTRACTOR shall coordinate reviews of the utility relocation information and obtain acceptance from the OWNER and DEPARTMENT when required. However, the OWNER shall apply for and obtain any required permits from the DEPARTMENT and perform any final design or proprietary design needed to administer its own relocation work if the work will not be included in the contract. If the preliminary plans indicate that no conflict exists, and the OWNER concurs with this information, the OWNER shall provide a letter of “no conflict” to the CONTRACTOR.

3. After award of the PROJECT, the CONTRACTOR will research any claimed compensable property interest for each OWNER claiming prior rights under section 3A and present the findings to the DEPARTMENT and OWNER for approval. The plans and estimate for the utility work shall be subject to approval of both the DEPARTMENT and the OWNER prior to construction. If the OWNER chooses to perform its own relocations and the OWNER holds no property interest as stated above; the OWNER shall confirm in writing that the OWNER will relocate its own facilities at no cost to the DEPARTMENT or the CONTRACTOR.

4. All construction engineering and contract supervision shall be the responsibility of the DEPARTMENT and the CONTRACTOR to ensure that all utility work included in the contract is accomplished in accordance with the PROJECT’s plans and specifications. The CONTRACTOR will consult with the OWNER before authorizing any changes or deviations which affect the OWNER’s facility.

5. For utility work included in the contract, the CONTRACTOR shall ensure that the design/construction and installation of the OWNER’S facilities is performed by a contractor/design consultant pre-approved/registered with both the DEPARTMENT and the OWNER. For any work included in the contract, excluding water and sewer, the OWNER will provide a list of pre-approved/registered contractors/design consultants on page 6 of the MOU.

6. For Utility work included in the contract, the OWNER or the OWNER’s Consultant shall have the right to visit and inspect the work at any time and advise the CONTRACTOR and the DEPARTMENT’S Engineer of any observed discrepancies or potential issues. The DEPARTMENT agrees to notify the OWNER when all utility work is completed and ready for final inspection by the OWNER.

7. Upon Maintenance Acceptance or Final Acceptance of the utility work included in the contract and upon certification by the DEPARTMENT’S Engineer and the OWNER that the work has been completed in accordance with the plans and specifications, the OWNER will accept the adjusted, relocated, and additional facilities and will thereafter operate and maintain said facilities located within the PROJECT right of way subject to the DEPARTMENT’S Utility Accommodations Policy and Standards Manual (UAM), current edition” and any agreements in effect without further cost to the DEPARTMENT or it’s CONTRACTOR. Final acceptance of the utility relocation work is accomplished by the execution of the Utility Facility Relocation Acceptance Form. The CONTRACTOR shall provide the OWNER with a complete set of “As-Built Plans” for review and approval reflecting the relocation work performed by the CONTRACTOR. Upon completion of the Utility Facility Relocation Acceptance Form and the exchange of the final OWNER approved “As-Built Plans”, the OWNER will operate and maintain the installed facilities going forward based on the date of execution of the Utility Facility Relocation Acceptance Form by the DEPARTMENT.

8. For utility coordination, relocation and reimbursement matters, the OWNER shall cooperate with the CONTRACTOR in the same manner as if coordinating directly with the DEPARTMENT in accordance with the laws of the State of Georgia, the DEPARTMENT’S UAM and any agreements in effect between the DEPARTMENT and OWNER. The OWNER agrees to cooperate in good faith with the CONTRACTOR and to respond to all requests for information or meetings required to reach a resolution of any disputed items.
9. All Utility work included in the PROJECT's contract and Utility work completed by the OWNER that is reimbursed by the DEPARTMENT through an agreement shall be in accordance with the BUY AMERICA requirements of the Federal regulations (23 U.S.C. 313 and 23 CFR 635.410) all manufacturing processes for steel and iron products or predominantly of steel or iron furnished for permanent incorporation into the work on this project shall occur in the United States. The only exception to this requirement is the production of pig iron and the processing, pelletizing and reduction of iron ore, which may occur in another country. Other than these exceptions, all melting, rolling, extruding, machining, bending, grinding, drilling, coating, etc. must occur in the United States.

a. Products of steel include, but are not limited to, such products as structural steel piles, reinforcing steel, structural plate, steel culverts, and guardrail steel supports for signs, signals and luminaires. Products of iron include, but are not limited to, such products as cast iron frames and grates and ductile iron pipe. Coatings include, but are not limited to, the applications of epoxy, galvanizing and paint. The coating material is not limited to this clause, only the application process.

b. A Certificate of Compliance shall be furnished for steel and iron products as part of the backup information with the billing. The form for this certification entitled “Buy America Certificate of Compliance” is attached to this agreement as “Exhibit A.” Records to be maintained by the Developer for this certification shall include a signed mill test report and a signed certification by each supplier, distributor, fabricator, and manufacturer that has handled the steel or iron product affirming that every process, including the application of a coating, performed on the steel or iron product has been carried out in the United States of America, except as allowed by this Section. The lack of these certifications will be justification for rejection of the steel and/or iron product or nonpayment of the work.

The requirements of said law and regulations do not prevent the use of miscellaneous steel or iron components, subcomponents and hardware necessary to encase, assemble and construct the above products, manufactured products that are not predominantly steel or iron or a minimal use of foreign steel and iron materials if the cost of such materials used does not exceed one-tenth of one percent (0.1%) of the total contract price or $2,500.00, whichever is greater. The Memorandum of Understanding will be incorporated into the project contract by reference or Exhibit.

APPROVED FOR THE OWNER BY:

[Signature] 5/22/2018
(Signature) (Date)

Construction Coordinator

>Title

APPROVED FOR THE DEPARTMENT BY:

[Signature] 6/1/18
(Signature) (Date)

STATE UTILITIES ADMINISTRATOR
Pre-Approved Contractor List

Company Name: Southeast Utilities
Address: 1020 Franke Industrial Dr Augusta GA 30909
Phone: (706)733-3053
Contact Person: John McCullough
E-Mail: ccujmccullough@comcast.com

Please provide a minimum of three.

Pre-Approved Design Consultant List

Company Name: Rainbow Design
Address:
Phone: (502)384-9790
Contact Person: Chris Downey – Design manager
E-Mail: Comcast.support@rainbowdesign.net or christopher.downey@rainbowdesign.net

Company Name:
Address:
Phone:
Contact Person:
E-Mail:

Company Name:
Address:
Phone:
Contact Person:
E-Mail:
Georgia DOT Project: I-20 at Savannah River
GDOT P.I. 210327

DESIGN-BUILD
MEMORANDUM OF UNDERSTANDING
between the
Georgia Department of Transportation (hereafter the DEPARTMENT)
and
Edgefield Water and Sewer (hereafter the OWNER)

Whereas GDOT, hereafter referred to as the DEPARTMENT, proposes to undertake a design-build project, hereafter referred to as the I-20 at Savannah River PROJECT, to widen Interstate 20 and replace the Savannah River and Augusta Canal bridges in Richmond County, Georgia and Aiken County, South Carolina by contract through competitive bidding procedures; and,

Whereas the DEPARTMENT will accomplish the PROJECT through a Design Consultant, Design Consultant Team and/or Contractor, hereafter referred to as CONTRACTOR; and the utility owner hereafter referred to as the OWNER, and

Whereas, where OWNER has property rights (“Prior Rights”) at the location of the PROJECT, OWNER will provide written evidence as to said prior rights within the area and will provide written documentation of prior rights relating to any individual crossing or Utility Facility, at the location of the PROJECT; and

Whereas, OWNER acknowledges that, generally, absent a showing of prior rights, the costs of relocation, protection, removal, or adjustment performed by OWNER shall be borne by OWNER; and

Whereas, pursuant to O.C.G.A. § 32-6-170(b), DEPARTMENT is authorized to pay or participate in the payment of the costs of relocation, protection, or adjustment of OWNER’S facilities where DEPARTMENT has made the determination that (i) such payments are in the best interest of the public and necessary in order to expedite the staging of the design-build project; and (ii) the costs of the removal, relocation, protection, or adjustment of such facilities are included as part of the Contract between the Department and the Department's roadway contractor for the design-build project; and

1. Type of Utility
OWNER has the following utility facilities which may need to be adjusted or relocated as a result of the proposed PROJECT:

Type of facility or facilities of OWNER:

X Domestic water mains and distribution lines and associated appurtenances
_____ Sanitary Sewer facilities and/or Storm Drainage System
_____ Electrical Distribution (overhead and underground) wires, poles, etc.
_____ Electrical Transmission (overhead and underground) wires, poles, etc.
_____ Natural Gas Distribution Facilities (underground)
_____ Natural Gas Transmission Facilities (underground)
_____ Petroleum Pipeline (underground)
_____ Telecommunications facilities and equipment
_____ Cable TV facilities
_____ Street Lighting
_____ Internet Data Service
_____ Other Facilities (Description) ____________________________
2. New Utility Facilities Proposed (Betterment)

OWNER desires the following to be installed as new additional facilities within the PROJECT. Insert here or attach a detailed description of proposed new additional utility installations:

3. Assignment of Responsibilities for Design and Construction

This MEMORANDUM OF UNDERSTANDING and the following shall serve as a basis for assignment of responsibilities and costs for the DEPARTMENT, CONTRACTOR and the OWNER to enter into a Standard Utility Agreement (SUA) or Contract Item Agreement (CIA), if necessary, with OWNER once the PROJECT is awarded to the CONTRACTOR. For a PROJECT implementation, GDOT will not have in its possession exact costing plans to be utilized to determine exact locations of the removal, relocation, protection, or adjustment. However, Overhead/Subsurface Utility Engineering (SUE) investigations plans exist providing the best information and signifying the layout of known existing facilities. Please use these plans for developing the final determination of services as indicated below. The CONTRACTOR developed plans will be provided to the OWNER after the design build project is awarded by GDOT which shall be used by the CONTRACTOR as the final basis for the SUA or CIA. Betterment costs will be the OWNER’S responsibility.

NOTE: Water and Sewer Design and Construction relocation work put in the contract will automatically be accomplished by the DEPARTMENT’S CONTRACTOR. The UTILITY OWNER will still have design approval authority. (No Pre-Approved Contractor/Consultant List required, leave page 6 blank). If you are a Water & Sewer Utility and choose to put your relocation Design and Construction in the contract, please check Design and Construction under Option 2 under 3B. Owner’s electing to perform their own design, at their own cost, please select design under 3C.

OWNER hereby intends to:

3A. OWNER, a: the DEPARTMENT’S cost through an Agreement, will provide the following services for the properties for which it has established prior rights (Check to signify):

Design
Construction: ________
3B. OWNER, at the CONTRACTOR’S cost, for any removal, relocation, protection, adjustment and/or design (Regardless of Prior Rights) will allow their facilities to be placed into the DEPARTMENT’S contract for the following services pursuant to O.C.G.A. § 32-6-170(b). The CONTRACTOR will add the removal, relocation, protection, materials, adjustment and/or design cost, excluding betterment, to the overall PROJECT’s cost. (Check to signify):

**Option 1**: OWNER wants the work to be performed by the OWNER’S pre-approved Design Consultants and/or Contractors.

Design _____
Construction _____

**Option 2**: OWNER wants the DEPARTMENT’S CONTRACTOR to perform the design and/or construction. (Check to signify):

Design ___ X ___
Construction ___ X ___  **If both are checked, please leave page 6 blank.**

As per this section, all work necessary for the removal, relocation, protection, or adjustment of the described utilities in accordance with the plans when approved shall be included in the project contract and accomplished by the CONTRACTOR except as follows (Check none or list any work items to be performed by the OWNER)

None _____

Excluded Items ____________________________________________
________________________________________________________
________________________________________________________

Comments:
_______________________________________________________
________________________________________________________
________________________________________________________
________________________________________________________

3C. OWNER, at OWNER’S cost, will provide the following services (Check to signify):

Design _____
Construction _____
The following is hereby mutually agreed to and understood by both parties:

1. The identification of existing facilities including preparation of Overhead/Subsurface Utility Engineering (SUE) investigations plans will be accomplished by the DEPARTMENT prior to award of the PROJECT and thereafter supplemented by the CONTRACTOR.

2. The CONTRACTOR shall coordinate reviews of the utility relocation information and obtain acceptance from the OWNER and DEPARTMENT when required. However, the OWNER shall apply for and obtain any required permits from the DEPARTMENT and perform any final design or proprietary design needed to administer its own relocation work if the work will not be included in the contract. If the preliminary plans indicate that no conflict exists, and the OWNER consents with this information, the OWNER shall provide a letter of "no conflict" to the CONTRACTOR.

3. After award of the PROJECT, the CONTRACTOR will research any claimed compensable property interest for each OWNER claiming prior rights under section 3A and present the findings to the DEPARTMENT and OWNER for approval. The plans and estimate for the utility work shall be subject to approval of both the DEPARTMENT and the OWNER prior to construction. If the OWNER chooses to perform its own relocations and the OWNER holds no property interest as stated above; the OWNER shall confirm in writing that the OWNER will relocate its own facilities at no cost to the DEPARTMENT or the CONTRACTOR.

4. All construction engineering and contract supervision shall be the responsibility of the DEPARTMENT and the CONTRACTOR to ensure that all utility work included in the contract is accomplished in accordance with the PROJECT’s plans and specifications. The CONTRACTOR will consult with the OWNER before authorizing any changes or deviations which affect the OWNER’s facility.

5. For utility work included in the contract, the CONTRACTOR shall ensure that the design/construction and installation of the OWNER’S facilities is performed by a contractor/design consultant pre-approved/registered with both the DEPARTMENT and the OWNER. For any work included in the contract, excluding water and sewer, the OWNER will provide a list of pre-approved/registered contractors/design consultants on page 6 of the MOU.

6. For Utility work included in the contract, the OWNER or the OWNER’S Consultant shall have the right to visit and inspect the work at any time and advise the CONTRACTOR and the DEPARTMENT’S Engineer of any observed discrepancies or potential issues. The DEPARTMENT agrees to notify the OWNER when all utility work is completed and ready for final inspection by the OWNER.

7. Upon Maintenance Acceptance or Final Acceptance of the utility work included in the contract and upon certification by the DEPARTMENT’S Engineer and the OWNER that the work has been completed in accordance with the plans and specifications, the OWNER will accept the adjusted, relocated, and additional facilities and will thereafter operate and maintain said facilities located within the PROJECT right of way subject to the DEPARTMENT’S Utility Accommodations Policy and Standards Manual (UAM), current edition and any agreements in effect without further cost to the DEPARTMENT or its CONTRACTOR. Final acceptance of the utility relocation work is accomplished by the execution of the Utility Facility Relocation Acceptance Form. The CONTRACTOR shall provide the OWNER with a complete set of “As-Built Plans” for review and approval reflecting the relocation work performed by the CONTRACTOR. Upon completion of the Utility Facility Relocation Acceptance Form and the exchange of the final OWNER approved “As-Built Plans”, the OWNER will operate and maintain the installed facilities going forward based on the date of execution of the Utility Facility Relocation Acceptance Form by the DEPARTMENT.

8. For utility coordination, relocation and reimbursement matters, the OWNER shall cooperate with the CONTRACTOR in the same manner as if coordinating directly with the DEPARTMENT in accordance with the laws of the State of Georgia, the DEPARTMENT’S UAM and any agreements in effect between the DEPARTMENT and OWNER. The OWNER agrees to cooperate in good faith with the CONTRACTOR and to respond to all requests for information or meetings required to reach a resolution of any disputed items.
9. All Utility work included in the PROJECT’s contract and Utility work completed by the OWNER that is reimbursed by the DEPARTMENT through an agreement shall be in accordance with the BUY AMERICA requirements of the Federal regulations (23 U.S.C. 313 and 23 CFR 635.410) all manufacturing processes for steel and iron products or predominantly of steel or iron furnished for permanent incorporation into the work on this project shall occur in the United States. The only exception to this requirement is the production of pig iron and the processing, pelletizing and reduction of iron ore, which may occur in another country. Other than these exceptions, all melting, rolling, extruding, machining, bending, grinding, drilling, coating, etc. must occur in the United States.

a. Products of steel include, but are not limited to, such products as structural steel piles, reinforcing steel, structural plate, steel culverts, and guardrail steel supports for signs, signals and luminaires. Products of iron include, but are not limited to, such products as cast iron frames and grates and ductile iron pipe. Coatings include, but are not limited to, the applications of epoxy, galvanizing and paint. The coating material is not limited to this clause, only the application process.

b. A Certificate of Compliance shall be furnished for steel and iron products as part of the backup information with the billing. The form for this certification entitled “Buy America Certificate of Compliance” is attached to this agreement as “Exhibit A.” Records to be maintained by the Developer for this certification shall include a signed mill test report and a signed certification by each supplier, distributor, fabricator, and manufacturer that has handled the steel or iron product affirming that every process, including the application of a coating, performed on the steel or iron product has been carried out in the United States of America, except as allowed by this Section. The lack of these certifications will be justification for rejection of the steel and/or iron product or nonpayment of the work.

The requirements of said law and regulations do not prevent the use of miscellaneous steel or iron components, subcomponents and hardware necessary to encase, assemble and construct the above products, manufactured products that are not predominantly steel or iron or a minimal use of foreign steel and iron materials if the cost of such materials used does not exceed one-tenth of one percent (0.1%) of the total contract price or $2,500.00, whichever is greater. The Memorandum of Understanding will be incorporated into the project contract by reference or Exhibit.

APPROVED FOR THE OWNER BY:

(Signature)

ECWSA Administrator

(Title)

APPROVED FOR THE DEPARTMENT BY:

(Signature)

STATE UTILITIES ADMINISTRATOR

May 30, 2018

(Date)

6/1/18

(Date)
Pre-Approved Contractor List

Company Name:
Address:
Phone:
Contact Person:
E-Mail:

Company Name:
Address:
Phone:
Contact Person:
E-Mail:

Company Name:
Address:
Phone:
Contact Person:
E-Mail:

Please provide a minimum of three.

Pre-Approved Design Consultant List

Company Name:
Address:
Phone:
Contact Person:
E-Mail:

Company Name:
Address:
Phone:
Contact Person:
E-Mail:

Company Name:
Address:
Phone:
Contact Person:
E-Mail:
Georgia DOT Project: I-20 at Savannah River
GDOT P.I. 210327

DESIGN-BUILD
MEMORANDUM OF UNDERSTANDING
between the
Georgia Department of Transportation (hereafter the DEPARTMENT)
and
Georgia Power Distribution (hereafter the OWNER)

Whereas GDOT, hereafter referred to as the DEPARTMENT, proposes to undertake a design-build project, hereafter referred to as the I-20 at Savannah River PROJECT, to widen Interstate 20 and replace the Savannah River and Augusta Canal bridges in Richmond County, Georgia and Aiken County, South Carolina by contract through competitive bidding procedures; and,

Whereas the DEPARTMENT will accomplish the PROJECT through a Design Consultant, Design Consultant Team and/or Contractor, hereafter referred to as CONTRACTOR; and the utility owner hereafter referred to as the OWNER, and

Whereas, where OWNER has property rights ("Prior Rights") at the location of the PROJECT, OWNER will provide written evidence as to said prior rights within the area and will provide written documentation of prior rights relating to any individual crossing or Utility Facility, at the location of the PROJECT; and

Whereas, OWNER acknowledges that, generally, absent a showing of prior rights, the costs of relocation, protection, removal, or adjustment performed by OWNER shall be borne by OWNER; and

Whereas, pursuant to O.C.G.A. § 32-6-170(b), DEPARTMENT is authorized to pay or participate in the payment of the costs of relocation, protection, or adjustment of OWNER’S facilities where DEPARTMENT has made the determination that (i) such payments are in the best interest of the public and necessary in order to expedite the staging of the design-build project; and (ii) the costs of the removal, relocation, protection, or adjustment of such facilities are included as part of the Contract between the Department and the Department's roadway contractor for the design-build project; and

1. Type of Utility
OWNER has the following utility facilities which may need to be adjusted or relocated as a result of the proposed PROJECT:

Type of facility or facilities of OWNER:

☐ Domestic water mains and distribution lines and associated appurtenances
☐ Sanitary Sewer facilities and/or Storm Drainage System
☐ Electrical Distribution (overhead and underground) wires, poles, etc.
☐ Electrical Transmission (overhead and underground) wires, poles, etc.
☐ Natural Gas Distribution Facilities (underground)
☐ Natural Gas Transmission Facilities (underground)
☐ Petroleum Pipeline (underground)
☐ Telecommunications facilities and equipment
☐ Cable TV facilities
☐ Street Lighting
☐ Internet Data Service
☐ Other Facilities (Description)
2. New Utility Facilities Proposed (Betterment)

OWNER desires the following to be installed as new additional facilities within the PROJECT. Insert here or attach a detailed description of proposed new additional utility installations:

N/A

3. Assignment of Responsibilities for Design and Construction

This MEMORANDUM OF UNDERSTANDING and the following shall serve as a basis for assignment of responsibilities and costs for the DEPARTMENT, CONTRACTOR and the OWNER to enter into a Standard Utility Agreement (SUA) or Contract Item Agreement (CIA), if necessary, with OWNER once the PROJECT is awarded to the CONTRACTOR. For a PROJECT implementation, GDOT will not have in its possession exact costing plans to be utilized to determine exact locations of the removal, relocation, protection, or adjustment. However, Overhead/Subsurface Utility Engineering (SUE) investigations plans exist providing the best information and signifying the layout of known existing facilities. Please use these plans for developing the final determination of services as indicated below. The CONTRACTOR developed plans will be provided to the OWNER after the design build project is awarded by GDOT which shall be used by the CONTRACTOR as the final basis for the SUA or CIA. Betterment costs will be the OWNER’S responsibility.

NOTE: Water and Sewer Design and Construction relocation work put in the contract will automatically be accomplished by the DEPARTMENT’S CONTRACTOR. The UTILITY OWNER will still have design approval authority. (No Pre-Approved Contractor/Consultant List required, leave page 6 blank). If you are a Water & Sewer Utility and choose to put your relocation Design and Construction in the contract, please check Design and Construction under Option 2 under 3B. Owner’s electing to perform their own design, at their own cost, please select design under 3C.

OWNER hereby intends to:

3A. OWNER, at the DEPARTMENT’S cost through an Agreement, will provide the following services for the properties for which it has established prior rights (Check to signify):

Design
Construction
3B. OWNER, at the CONTRACTOR’S cost, for any removal, relocation, protection, adjustment and/or design (Regardless of Prior Rights) will allow their facilities to be placed into the DEPARTMENT’S contract for the following services pursuant to O.C.G.A. § 32-6-170(b). The CONTRACTOR will add the removal, relocation, protection, materials, adjustment and/or design cost, excluding betterment, to the overall PROJECT’s cost. (Check to signify):

**Option 1:** OWNER wants the work to be performed by the OWNER’s pre-approved Design Consultants and/or Contractors.

Design  _x_
Construction  _x_

**Option 2:** OWNER wants the DEPARTMENT’S CONTRACTOR to perform the design and/or construction. (Check to signify):

Design  ___  If both are checked, please leave page 6 blank.
Construction  ___

As per this section, all work necessary for the removal, relocation, protection, or adjustment of the described utilities in accordance with the plans when approved shall be included in the project contract and accomplished by the CONTRACTOR except as follows (Check none or list any work items to be performed by the OWNER)

None  _x_

Excluded Items  

Comments:


3C. OWNER, at OWNER’S cost, will provide the following services (Check to signify):

Design  ___
Construction  ___
The following is hereby mutually agreed to and understood by both parties:

1. The identification of existing facilities including preparation of Overhead/Subsurface Utility Engineering (SUE) investigations plans will be accomplished by the DEPARTMENT prior to award of the PROJECT and thereafter supplemented by the CONTRACTOR.

2. The CONTRACTOR shall coordinate reviews of the utility relocation information and obtain acceptance from the OWNER and DEPARTMENT when required. However, the OWNER shall apply for and obtain any required permits from the DEPARTMENT and perform any final design or proprietary design needed to administer its own relocation work if the work will not be included in the contract. If the preliminary plans indicate that no conflict exists, and the OWNER concurs with this information, the OWNER shall provide a letter of “no conflict” to the CONTRACTOR.

3. After award of the PROJECT, the CONTRACTOR will research any claimed compensable property interest for each OWNER claiming prior rights under section 3A and present the findings to the DEPARTMENT and OWNER for approval. The plans and estimate for the utility work shall be subject to approval of both the DEPARTMENT and the OWNER prior to construction. If the OWNER chooses to perform its own relocations and the OWNER holds no property interest as stated above; the OWNER shall confirm in writing that the OWNER will relocate its own facilities at no cost to the DEPARTMENT or the CONTRACTOR.

4. All construction engineering and contract supervision shall be the responsibility of the DEPARTMENT and the CONTRACTOR to ensure that all utility work included in the contract is accomplished in accordance with the PROJECT’s plans and specifications. The CONTRACTOR will consult with the OWNER before authorizing any changes or deviations which affect the OWNER’s facility.

5. For utility work included in the contract, the CONTRACTOR shall ensure that the design/contract and installation of the OWNER’S facilities is performed by a contractor/design consultant pre-approved/registered with both the DEPARTMENT and the OWNER. For any work included in the contract, excluding water and sewer, the OWNER will provide a list of pre-approved/registered contractors/design consultants on page 6 of the MOU.

6. For Utility work included in the contract, the OWNER or the OWNER’S Consultant shall have the right to visit and inspect the work at any time and advise the CONTRACTOR and the DEPARTMENT’S Engineer of any observed discrepancies or potential issues. The DEPARTMENT agrees to notify the OWNER when all utility work is completed and ready for final inspection by the OWNER.

7. Upon Maintenance Acceptance or Final Acceptance of the utility work included in the contract and upon certification by the DEPARTMENT’S Engineer and the OWNER that the work has been completed in accordance with the plans and specifications, the OWNER will accept the adjusted, relocated, and additional facilities and will thereafter operate and maintain said facilities located within the PROJECT right of way subject to the DEPARTMENT’S Utility Accommodations Policy and Standards Manual (UAM), current edition and any agreements in effect without further cost to the DEPARTMENT or it’s CONTRACTOR. Final acceptance of the utility relocation work is accomplished by the execution of the Utility Facility Relocation Acceptance Form. The CONTRACTOR shall provide the OWNER with a complete set of “As-Built Plans” for review and approval reflecting the relocation work performed by the CONTRACTOR. Upon completion of the Utility Facility Relocation Acceptance Form and the exchange of the final OWNER approved “As-Built Plans”, the OWNER will operate and maintain the installed facilities going forward based on the date of execution of the Utility Facility Relocation Acceptance Form by the DEPARTMENT.

8. For utility coordination, relocation and reimbursement matters, the OWNER shall cooperate with the CONTRACTOR in the same manner as if coordinating directly with the DEPARTMENT in accordance with the laws of the State of Georgia, the DEPARTMENT’S UAM and any agreements in effect between the DEPARTMENT and OWNER. The OWNER agrees to cooperate in good faith with the CONTRACTOR and to respond to all requests for information or meetings required to reach a resolution of any disputed items.
9. All Utility work included in the PROJECT's contract and Utility work completed by the OWNER that is reimbursed by the DEPARTMENT through an agreement shall be in accordance with the BUY AMERICA requirements of the Federal regulations (23 U.S.C. 313 and 23 CFR 635.410) all manufacturing processes for steel and iron products or predominantly of steel or iron furnished for permanent incorporation into the work on this project shall occur in the United States. The only exception to this requirement is the production of pig iron and the processing, pelletizing and reduction of iron ore, which may occur in another country. Other than these exceptions, all melting, rolling, extruding, machining, bending, grinding, drilling, coating, etc. must occur in the United States.

   a. Products of steel include, but are not limited to, such products as structural steel piles, reinforcing steel, structural plate, steel culverts, and guardrail steel supports for signs, signals and luminaires. Products of iron include, but are not limited to, such products as cast iron frames and grates and ductile iron pipe. Coatings include, but are not limited to, the applications of epoxy, galvanizing and paint. The coating material is not limited to this clause, only the application process.

   b. A Certificate of Compliance shall be furnished for steel and iron products as part of the backup information with the billing. The form for this certification entitled “Buy America Certificate of Compliance” is attached to this agreement as “Exhibit A.” Records to be maintained by the Developer for this certification shall include a signed mill test report and a signed certification by each supplier, distributor, fabricator, and manufacturer that has handled the steel or iron product affirming that every process, including the application of a coating, performed on the steel or iron product has been carried out in the United States of America, except as allowed by this Section. The lack of these certifications will be justification for rejection of the steel and/or iron product or nonpayment of the work.

The requirements of said law and regulations do not prevent the use of miscellaneous steel or iron components, subcomponents and hardware necessary to encase, assemble and construct the above products, manufactured products that are not predominantly steel or iron or a minimal use of foreign steel and iron materials if the cost of such materials used does not exceed one-tenth of one percent (0.1%) of the total contract price or $2,500.00, whichever is greater. The Memorandum of Understanding will be incorporated into the project contract by reference or Exhibit.

APPROVED FOR THE OWNER BY:

[Signature]  
May 2, 2018  
(Date)

Project Manager

[Title]

APPROVED FOR THE DEPARTMENT BY:

[Signature]  
6/7/18  
(Date)

STATE UTILITIES ADMINISTRATOR

PI # 210327
Pre-Approved Contractor List

Company Name: See Attachment
Address:
Phone:
Contact Person:
E-Mail:

Company Name:
Address:
Phone:
Contact Person:
E-Mail:

Company Name:
Address:
Phone:
Contact Person:
E-Mail:

Please provide a minimum of three.

Pre-Approved Design Consultant List

Company Name: See Attachment
Address:
Phone:
Contact Person:
E-Mail:

Company Name:
Address:
Phone:
Contact Person:
E-Mail:

Company Name:
Address:
Phone:
Contact Person:
E-Mail:
<table>
<thead>
<tr>
<th>Name</th>
<th>Contact</th>
<th>Phone Number</th>
<th>Email</th>
</tr>
</thead>
<tbody>
<tr>
<td>McLean Engineering</td>
<td>Sean Knowles</td>
<td>(404) 520-0238</td>
<td><a href="mailto:sean.knowles@mcleanengineering.com">sean.knowles@mcleanengineering.com</a></td>
</tr>
<tr>
<td>Storm Services</td>
<td>David Dent</td>
<td>(878) 728-7551</td>
<td>david.Gostormal.com</td>
</tr>
<tr>
<td>UC/Synergistic</td>
<td>Justin Simmons</td>
<td>336-445-8564</td>
<td><a href="mailto:jsimmons@ouestank.com">jsimmons@ouestank.com</a></td>
</tr>
<tr>
<td>Mastec</td>
<td>Copper Nelson</td>
<td>850-519-0964</td>
<td><a href="mailto:Copper.Nelson@masstec.com">Copper.Nelson@masstec.com</a></td>
</tr>
<tr>
<td>Pike Electric</td>
<td>Jim McCloud</td>
<td>770-601-2358</td>
<td><a href="mailto:JMcCloud@pike.com">JMcCloud@pike.com</a></td>
</tr>
<tr>
<td>Service Electric</td>
<td>Brian msand</td>
<td>(423) 265-3161</td>
<td><a href="mailto:Brian.msand@serviceelectrico.com">Brian.msand@serviceelectrico.com</a></td>
</tr>
<tr>
<td>Sumter Utilities</td>
<td>Mikei Murray</td>
<td>843-723-9621</td>
<td><a href="mailto:Mikei.Murray@nulicon.net">Mikei.Murray@nulicon.net</a></td>
</tr>
<tr>
<td>Utilicon</td>
<td>Jimmy Glover</td>
<td>(478) 348-3233</td>
<td><a href="mailto:jimmy.glover@utilicon.net">jimmy.glover@utilicon.net</a></td>
</tr>
<tr>
<td>Williams Electric</td>
<td>Rick Falls</td>
<td>(704) 484-1881</td>
<td><a href="mailto:rick.falls@4weico.com">rick.falls@4weico.com</a></td>
</tr>
</tbody>
</table>
Georgia DOT Project: I-20 at Savannah River
GDOT P.I. 210327

DESIGN-BUILD
MEMORANDUM OF UNDERSTANDING
between the
Georgia Department of Transportation (hereafter the DEPARTMENT) and
Georgia Power Transmission (hereafter the OWNER)

Whereas GDOT, hereafter referred to as the DEPARTMENT, proposes to undertake a design-build project, hereafter referred to as the I-20 at Savannah River PROJECT, to widen Interstate 20 and replace the Savannah River and Augusta Canal bridges in Richmond County, Georgia and Aiken County, South Carolina by contract through competitive bidding procedures; and,

Whereas the DEPARTMENT will accomplish the PROJECT through a Design Consultant, Design Consultant Team and/or Contractor, hereafter referred to as CONTRACTOR; and the utility owner hereafter referred to as the OWNER, and

Whereas, where OWNER has property rights ("Prior Rights") at the location of the PROJECT, OWNER will provide written evidence as to said prior rights within the area and will provide written documentation of prior rights relating to any individual crossing or Utility Facility, at the location of the PROJECT; and

Whereas, OWNER acknowledges that, generally, absent a showing of prior rights, the costs of relocation, protection, removal, or adjustment performed by OWNER shall be borne by OWNER; and

Whereas, pursuant to O.C.G.A. § 32-6-170(b), DEPARTMENT is authorized to pay or participate in the payment of the costs of relocation, protection, or adjustment of OWNER'S facilities where DEPARTMENT has made the determination that (i) such payments are in the best interest of the public and necessary in order to expedite the staging of the design-build project; and (ii) the costs of the removal, relocation, protection, or adjustment of such facilities are included as part of the Contract between the Department and the Department's roadway contractor for the design-build project; and

1. Type of Utility
OWNER has the following utility facilities which may need to be adjusted or relocated as a result of the proposed PROJECT:

Type of facility or facilities of OWNER:

- Domestic water mains and distribution lines and associated appurtenances
- Sanitary Sewer facilities and/or Storm Drainage System
- Electrical Distribution (overhead and underground) wires, poles, etc.
- Electrical Transmission (overhead and underground) wires, poles, etc.
- Natural Gas Distribution Facilities (underground)
- Natural Gas Transmission Facilities (underground)
- Petroleum Pipeline (underground)
- Telecommunications facilities and equipment
- Cable TV facilities
- Street Lighting
- Internet Data Service
- Other Facilities (Description)
2. New Utility Facilities Proposed (Betterment)

OWNER desires the following to be installed as new additional facilities within the PROJECT. Insert here or attach a detailed description of proposed new additional utility installations:

N/A

3. Assignment of Responsibilities for Design and Construction

This MEMORANDUM OF UNDERSTANDING and the following shall serve as a basis for assignment of responsibilities and costs for the DEPARTMENT, CONTRACTOR and the OWNER to enter into a Standard Utility Agreement (SUA) or Contract Item Agreement (CIA), if necessary, with OWNER once the PROJECT is awarded to the CONTRACTOR. For a PROJECT implementation, GDOT will not have in its possession exact costing plans to be utilized to determine exact locations of the removal, relocation, protection, or adjustment. However, Overhead/Subsurface Utility Engineering (SUE) investigations plans exist providing the best information and signifying the layout of known existing facilities. Please use these plans for developing the final determination of services as indicated below. The CONTRACTOR developed plans will be provided to the OWNER after the design build project is awarded by GDOT which shall be used by the CONTRACTOR as the final basis for the SUA or CIA. Betterment costs will be the OWNER’S responsibility.

NOTE: Water and Sewer Design and Construction relocation work put in the contract will automatically be accomplished by the DEPARTMENT’S CONTRACTOR. The UTILITY Owner will still have design approval authority. (No Pre-Approved Contractor/Consultant List required, leave page 6 blank). If you are a Water & Sewer Utility and choose to put your relocation Design and Construction in the contract, please check Design and Construction under Option 2 under 3B. Owner’s electing to perform their own design, at their own cost, please select design under 3C.

OWNER hereby intends to:

3A. OWNER, at the DEPARTMENT’S cost through an Agreement, will provide the following services for the properties for which it has established prior rights (Check to signify):

Design
Construction
3B. OWNER, at the CONTRACTOR’S cost, for any removal, relocation, protection, adjustment and/or design (Regardless of Prior Rights) will allow their facilities to be placed into the DEPARTMENT’S contract for the following services pursuant to O.C.G.A. § 32-6-170(b). The CONTRACTOR will add the removal, relocation, protection, materials, adjustment and/or design cost, excluding betterment, to the overall PROJECT’s cost. (Check to signify):

**Option 1:** OWNER wants the work to be performed by the OWNER’s pre-approved Design Consultants and/or Contractors.

Design  ___ x ___
Construction  ___ x ___

**Option 2:** OWNER wants the DEPARTMENT’S CONTRACTOR to perform the design and/or construction. (Check to signify):

Design ___
Construction ___

If both are checked, please leave page 6 blank.

As per this section, all work necessary for the removal, relocation, protection, or adjustment of the described utilities in accordance with the plans when approved shall be included in the project contract and accomplished by the CONTRACTOR except as follows (Check none or list any work items to be performed by the OWNER)

None ___

Excluded Items __________________________
____________________________________
____________________________________

Comments:
____________________________________
____________________________________
____________________________________

3C. OWNER, at OWNER’S cost, will provide the following services (Check to signify):

Design ___
Construction ___
The following is hereby mutually agreed to and understood by both parties:

1. The identification of existing facilities including preparation of Overhead/Subsurface Utility Engineering (SUE) investigations plans will be accomplished by the DEPARTMENT prior to award of the PROJECT and thereafter supplemented by the CONTRACTOR.

2. The CONTRACTOR shall coordinate reviews of the utility relocation information and obtain acceptance from the OWNER and DEPARTMENT when required. However, the OWNER shall apply for and obtain any required permits from the DEPARTMENT and perform any final design or proprietary design needed to administer its own relocation work if the work will not be included in the contract. If the preliminary plans indicate that no conflict exists, and the OWNER concurs with this information, the OWNER shall provide a letter of “no conflict” to the CONTRACTOR.

3. After award of the PROJECT, the CONTRACTOR will research any claimed compensable property interest for each OWNER claiming prior rights under section 3A and present the findings to the DEPARTMENT and OWNER for approval. The plans and estimate for the utility work shall be subject to approval by both the DEPARTMENT and the OWNER prior to construction. If the OWNER chooses to perform its own relocations and the OWNER holds no property interest as stated above, the OWNER shall confirm in writing that the OWNER will relocate its own facilities at no cost to the DEPARTMENT or the CONTRACTOR.

4. All construction engineering and contract supervision shall be the responsibility of the DEPARTMENT and the CONTRACTOR to ensure that all utility work included in the contract is accomplished in accordance with the PROJECT’s plans and specifications. The CONTRACTOR will consult with the OWNER before authorizing any changes or deviations which affect the OWNER’s facility.

5. For utility work included in the contract, the CONTRACTOR shall ensure that the design/construction and installation of the OWNER’S facilities is performed by a contractor/design consultant pre-approved/registered with both the DEPARTMENT and the OWNER. For any work included in the contract, excluding water and sewer, the OWNER will provide a list of pre-approved/registered contractors/design consultants on page 6 of the MOU.

6. For Utility work included in the contract, the OWNER or the OWNER’s Consultant shall have the right to visit and inspect the work at any time and advise the CONTRACTOR and the DEPARTMENT’S Engineer of any observed discrepancies or potential issues. The DEPARTMENT agrees to notify the OWNER when all utility work is completed and ready for final inspection by the OWNER.

7. Upon Maintenance Acceptance or Final Acceptance of the utility work included in the contract and upon certification by the DEPARTMENT’S Engineer and the OWNER that the work has been completed in accordance with the plans and specifications, the OWNER will accept the adjusted, relocated, and additional facilities and will thereafter operate and maintain said facilities located within the PROJECT right of way subject to the DEPARTMENT’S Utility Accommodations Policy and Standards Manual (UAM), current edition” and any agreements in effect without further cost to the DEPARTMENT or its CONTRACTOR. Final acceptance of the utility relocation work is accomplished by the execution of the Utility Facility Relocation Acceptance Form. The CONTRACTOR shall provide the OWNER with a complete set of “As-Built Plans” for review and approval reflecting the relocation work performed by the CONTRACTOR. Upon completion of the Utility Facility Relocation Acceptance Form and the exchange of the final OWNER approved “As-Built Plans”, the OWNER will operate and maintain the installed facilities going forward based on the date of execution of the Utility Facility Relocation Acceptance Form by the DEPARTMENT.

8. For utility coordination, relocation and reimbursement matters, the OWNER shall cooperate with the CONTRACTOR in the same manner as if coordinating directly with the DEPARTMENT in accordance with the laws of the State of Georgia, the DEPARTMENT’S UAM and any agreements in effect between the DEPARTMENT and OWNER. The OWNER agrees to cooperate in good faith with the CONTRACTOR and to respond to all requests for information or meetings required to reach a resolution of any disputed items.
9. All Utility work included in the PROJECT’s contract and Utility work completed by the OWNER that is reimbursed by the DEPARTMENT through an agreement shall be in accordance with the BUY AMERICA requirements of the Federal regulations (23 U.S.C. 313 and 23 CFR 635.410) all manufacturing processes for steel and iron products or predominantly of steel or iron furnished for permanent incorporation into the work on this project shall occur in the United States. The only exception to this requirement is the production of pig iron and the processing, pelletizing and reduction of iron ore, which may occur in another country. Other than these exceptions, all melting, rolling, extruding, machining, bending, grinding, drilling, coating, etc. must occur in the United States.

a. Products of steel include, but are not limited to, such products as structural steel piles, reinforcing steel, structural plate, steel culverts, and guardrail steel supports for signs, signals and luminaires. Products of iron include, but are not limited to, such products as cast iron frames and gates and ductile iron pipe. Coatings include, but are not limited to, the applications of epoxy, galvanizing and paint. The coating material is not limited to this clause, only the application process.

b. A Certificate of Compliance shall be furnished for steel and iron products as part of the backup information with the billing. The form for this certification entitled “Buy America Certificate of Compliance” is attached to this agreement as “Exhibit A.” Records to be maintained by the Developer for this certification shall include a signed mill test report and a signed certification by each supplier, distributor, fabricator, and manufacturer that has handled the steel or iron product affirming that every process, including the application of a coating, performed on the steel or iron product has been carried out in the United States of America, except as allowed by this Section. The lack of these certifications will be justification for rejection of the steel and/or iron product or nonpayment of the work.

The requirements of said law and regulations do not prevent the use of miscellaneous steel or iron components, subcomponents and hardware necessary to encase, assemble and construct the above products, manufactured products that are not predominantly steel or iron or a minimal use of foreign steel and iron materials if the cost of such materials used does not exceed one-tenth of one percent (0.1%) of the total contract price or $2,500.00, whichever is greater. The Memorandum of Understanding will be incorporated into the project contract by reference or Exhibit.

APPROVED FOR THE OWNER BY:

[Signature]

(Title)

APPROVED FOR THE DEPARTMENT BY:

[Signature]

(Title)
Pre-Approved Contractor List

Company Name: See Attachment
Address:
Phone:
Contact Person:
E-Mail:

Company Name: See Attachment
Address:
Phone:
Contact Person:
E-Mail:

Company Name: See Attachment
Address:
Phone:
Contact Person:
E-Mail:

Please provide a minimum of three.

Pre-Approved Design Consultant List
See Attachment

Company Name:
Address:
Phone:
Contact Person:
E-Mail:

Company Name:
Address:
Phone:
Contact Person:
E-Mail:

Company Name:
Address:
Phone:
Contact Person:
E-Mail:
EXHIBIT A
UTILITY OWNER PRE-APPROVED CONTRACTOR/CONSULTANT LIST

Pre-Approved Contractor List

Company Name: Irby Construction
Address: 817 South State Street
Phone: 601-709-4729
Contact Person: John Hopper
E-Mail: hopper@irbyconst.com

Company Name: Service Electric
Address: 1631 East 25th Street, Chattanooga, TN 37404
Phone: 423-265-3161
Contact Person: Jody Shea
E-Mail: jshea@serviceelectricco.com

Company Name: Pike Electric
Address: 100 Pike Way, Mount Airy, NC 27030
Phone: 336-789-2171
Contact Person: Todd Badgett
E-Mail: tbadgett@pike.com

Company Name: Sumter Utilities
Address: 1151 North Pike West, Sumter, SC 29153
Phone: 803-469-8585
Contact Person: Colin Chalup
E-Mail: cchalupa@summail.com

Company Name: Utilicon
Address: 13275 Highway 231, Davisboro, GA 31018
Phone: 478-348-3233
Contact Person: Joan Glover
E-Mail: joan.glover@utilicon.net

Company Name: L.E. Myers
Address: 401 Chestnut Street, Suite 120; Chattanooga, TN 37402
Phone: 423-265-4441 x 4133
Contact Person: Danny Gessman
E-Mail: dgessman@myrgroup.com
EXHIBIT A
UTILITY OWNER PRE-APPROVED CONTRACTOR/CONSULTANT LIST

Pre-Approved Design Consultant List

Company: **Apogee Engineers, LLC**
Address: 4856 Anderson Road
Orlando, Florida 32812
Contact Person: David H. Seligson
Phone: 407-658-7590
Email: David.Seligson@ApogeeEngineers.com

Company: **Mesa Associates**
Address: 629 Market Street, Suite 200
Chattanooga, TN 37402
Contact Person: Kazem Shomali
Phone: 423-424-7345
Email: kshomali@mesainc.com

Company Name: **Power Delivery Solutions**
Address: 100 Commerce Drive, Suite 201
Newark, DE 19713
Contact Person: Dean Sevy
Phone: 770-617-6921
Email: Dsevy@powerdsslce.com

Company: **S. Nelson & Associates**
Address: 110 Evans Mill Drive Suite 204
Dallas, GA 30157
Contact Person: Graham Smith
Phone: 770-841-8242
Email: GSmith@S-NELSON.COM
Georgia DOT Project: I-20 at Savannah River  
GDOT P.I. 210327

DESIGN-BUILD  
MEMORANDUM OF UNDERSTANDING  
between the  
Georgia Department of Transportation (hereafter the DEPARTMENT)  
and  
Tower Cloud (hereafter the OWNER)

Whereas GDOT, hereafter referred to as the DEPARTMENT, proposes to undertake a design-build project, hereafter referred to as the I-20 at Savannah River PROJECT, to widen Interstate 20 and replace the Savannah River and Augusta Canal bridges in Richmond County, Georgia and Aiken County, South Carolina by contract through competitive bidding procedures; and,

Whereas the DEPARTMENT will accomplish the PROJECT through a Design Consultant, Design Consultant Team and/or Contractor, hereafter referred to as CONTRACTOR; and the utility owner hereafter referred to as the OWNER, and

Whereas, where OWNER has property rights ("Prior Rights") at the location of the PROJECT, OWNER will provide written evidence as to said prior rights within the area and will provide written documentation of prior rights relating to any individual crossing or Utility Facility, at the location of the PROJECT; and

Whereas, OWNER acknowledges that, generally, absent a showing of prior rights, the costs of relocation, protection, removal, or adjustment performed by OWNER shall be borne by OWNER; and

Whereas, pursuant to O.C.G.A. § 32-6-170(b), DEPARTMENT is authorized to pay or participate in the payment of the costs of relocation, protection, or adjustment of OWNER'S facilities where DEPARTMENT has made the determination that (i) such payments are in the best interest of the public and necessary in order to expedite the staging of the design-build project; and (ii) the costs of the removal, relocation, protection, or adjustment of such facilities are included as part of the Contract between the Department and the Department's roadway contractor for the design-build project; and

1. Type of Utility  
OWNER has the following utility facilities which may need to be adjusted or relocated as a result of the proposed PROJECT:

Type of facility or facilities of OWNER:  
- Domestic water mains and distribution lines and associated appurtenances  
- Sanitary Sewer facilities and/or Storm Drainage System  
- Electrical Distribution (overhead and underground) wires, poles, etc.  
- Electrical Transmission (overhead and underground) wires, poles, etc.  
- Natural Gas Distribution Facilities (underground)  
- Natural Gas Transmission Facilities (underground)  
- Petroleum Pipeline (underground)  
- Telecommunications facilities and equipment  
- Cable TV facilities  
- Street Lighting  
- Internet Data Service  
- Other Facilities (Description)
2. New Utility Facilities Proposed (Betterment)

OWNER desires the following to be installed as new additional facilities within the PROJECT. Insert here or attach a detailed description of proposed new additional utility installations:

Replacing with same facilities that are already installed

3. Assignment of Responsibilities for Design and Construction

This MEMORANDUM OF UNDERSTANDING and the following shall serve as a basis for assignment of responsibilities and costs for the DEPARTMENT, CONTRACTOR and the OWNER to enter into a Standard Utility Agreement (SUA) or Contract Item Agreement (CIA), if necessary, with OWNER once the PROJECT is awarded to the CONTRACTOR. For a PROJECT implementation, GDOT will not have in its possession exact costing plans to be utilized to determine exact locations of the removal, relocation, protection, or adjustment. However, Overhead/Subsurface Utility Engineering (SUE) investigations plans exist providing the best information and signifying the layout of known existing facilities. Please use these plans for developing the final determination of services as indicated below. The CONTRACTOR developed plans will be provided to the OWNER after the design build project is awarded by GDOT which shall be used by the CONTRACTOR as the final basis for the SUA or CIA. Betterment costs will be the OWNER’S responsibility.

NOTE: Water and Sewer Design and Construction relocation work put in the contract will automatically be accomplished by the DEPARTMENT’S CONTRACTOR. The UTILITY OWNER will still have design approval authority. (No Pre-Approved Contractor/Consultant List required, leave page 6 blank). If you are a Water & Sewer Utility and choose to put your relocation Design and Construction in the contract, please check Design and Construction under Option 2 under 3B. Owner’s electing to perform their own design, at their own cost, please select design under 3C.

OWNER hereby intends to:

3A. OWNER, at the DEPARTMENT’S cost through an Agreement, will provide the following services for the properties for which it has established prior rights (Check to signify):

Design  _____
Construction  _____
3B. OWNER, at the CONTRACTOR’S cost, for any removal, relocation, protection, adjustment and/or design (Regardless of Prior Rights) will allow their facilities to be placed into the DEPARTMENT’S contract for the following services pursuant to O.C.G.A. § 32-6-170(b). The CONTRACTOR will add the removal, relocation, protection, materials, adjustment and/or design cost, excluding betterment, to the overall PROJECT’s cost. (Check to signify):

Option 1: OWNER wants the work to be performed by the OWNER’s pre-approved Design Consultants and/or Contractors.

Design  
Construction  

Option 2: OWNER wants the DEPARTMENT’S CONTRACTOR to perform the design and/or construction. (Check to signify):

Design  
Construction  
If both are checked, please leave page 6 blank.

As per this section, all work necessary for the removal, relocation, protection, or adjustment of the described utilities in accordance with the plans when approved shall be included in the project contract and accomplished by the CONTRACTOR except as follows (Check none or list any work items to be performed by the OWNER)

None  

Excluded Items  

Comments:


3C. OWNER, at OWNER’S cost, will provide the following services (Check to signify):

Design  
Construction  

PI # 210327
The following is hereby mutually agreed to and understood by both parties:

1. The identification of existing facilities including preparation of Overhead/Subsurface Utility Engineering (SUE) investigations plans will be accomplished by the DEPARTMENT prior to award of the PROJECT and thereafter supplemented by the CONTRACTOR.

2. The CONTRACTOR shall coordinate reviews of the utility relocation information and obtain acceptance from the OWNER and DEPARTMENT when required. However, the OWNER shall apply for and obtain any required permits from the DEPARTMENT and perform any final design or proprietary design needed to administer its own relocation work if the work will not be included in the contract. If the preliminary plans indicate that no conflict exists, and the OWNER concurs with this information, the OWNER shall provide a letter of "no conflict" to the CONTRACTOR.

3. After award of the PROJECT, the CONTRACTOR will research any claimed compensable property interest for each OWNER claiming prior rights under section 3A and present the findings to the DEPARTMENT and OWNER for approval. The plans and estimates for the utility work shall be subject to approval of both the DEPARTMENT and the OWNER prior to construction. If the OWNER chooses to perform its own relocations and the OWNER holds no property interest as stated above; the OWNER shall confirm in writing that the OWNER will relocate its own facilities at no cost to the DEPARTMENT or the CONTRACTOR.

4. All construction engineering and contract supervision shall be the responsibility of the DEPARTMENT and the CONTRACTOR to ensure that all utility work included in the contract is accomplished in accordance with the PROJECT’s plans and specifications. The CONTRACTOR will consult with the OWNER before authorizing any changes or deviations which affect the OWNER’s facility.

5. For utility work included in the contract, the CONTRACTOR shall ensure that the design/construction and installation of the OWNER’S facilities is performed by a contractor/design consultant pre-approved/registered with both the DEPARTMENT and the OWNER. For any work included in the contract, excluding water and sewer, the OWNER will provide a list of pre-approved/registered contractors/design consultants on page 6 of the MOU.

6. For Utility work included in the contract, the OWNER or the OWNER’s Consultant shall have the right to visit and inspect the work at any time and advise the CONTRACTOR and the DEPARTMENT’S Engineer of any observed discrepancies or potential issues. The DEPARTMENT agrees to notify the OWNER when all utility work is completed and ready for final inspection by the OWNER.

7. Upon Maintenance Acceptance or Final Acceptance of the utility work included in the contract and upon certification by the DEPARTMENT’S Engineer and the OWNER that the work has been completed in accordance with the plans and specifications, the OWNER will accept the adjusted, relocated, and additional facilities and will thereafter operate and maintain said facilities located within the PROJECT right of way subject to the DEPARTMENT’S Utility Accommodations Policy and Standards Manual (UAM), current edition and any agreements in effect without further cost to the DEPARTMENT or it’s CONTRACTOR. Final acceptance of the utility relocation work is accomplished by the execution of the Utility Facility Relocation Acceptance Form. The CONTRACTOR shall provide the OWNER with a complete set of “As-Built Plans” for review and approval reflecting the relocation work performed by the CONTRACTOR. Upon completion of the Utility Facility Relocation Acceptance Form and the exchange of the final OWNER approved “As-Built Plans”, the OWNER will operate and maintain the installed facilities going forward based on the date of execution of the Utility Facility Relocation Acceptance Form by the DEPARTMENT.

8. For utility coordination, relocation and reimbursement matters, the OWNER shall cooperate with the CONTRACTOR in the same manner as if coordinating directly with the DEPARTMENT in accordance with the laws of the State of Georgia, the DEPARTMENT’S UAM and any agreements in effect between the DEPARTMENT and OWNER. The OWNER agrees to cooperate in good faith with the CONTRACTOR and to respond to all requests for information or meetings required to reach a resolution of any disputed items.

PI # 210327
9. All Utility work included in the PROJECT’s contract and Utility work completed by the OWNER that is reimbursed by the DEPARTMENT through an agreement shall be in accordance with the BUY AMERICA requirements of the Federal regulations (23 U.S.C. 313 and 23 CFR 635.410) all manufacturing processes for steel and iron products or predominantly of steel or iron furnished for permanent incorporation into the work on this project shall occur in the United States. The only exception to this requirement is the production of pig iron and the processing, pelletizing and reduction of iron ore, which may occur in another country. Other than these exceptions, all melting, rolling, extruding, machining, bending, grinding, drilling, coating, etc. must occur in the United States.

a. Products of steel include, but are not limited to, such products as structural steel piles, reinforcing steel, structural plate, steel culverts, and guardrail steel supports for signs, signals and luminaires. Products of iron include, but are not limited to, such products as cast iron frames and grates and ductile iron pipe. Coatings include, but are not limited to, the applications of epoxy, galvanizing and paint. The coating material is not limited to this clause, only the application process.

b. A Certificate of Compliance shall be furnished for steel and iron products as part of the backup information with the billing. The form for this certification entitled “Buy America Certificate of Compliance” is attached to this agreement as “Exhibit A.” Records to be maintained by the Developer for this certification shall include a signed mill test report and a signed certification by each supplier, distributor, fabricator, and manufacturer that has handled the steel or iron product affirming that every process, including the application of a coating, performed on the steel or iron product has been carried out in the United States of America, except as allowed by this Section. The lack of these certifications will be justification for rejection of the steel and/or iron product or nonpayment of the work.

The requirements of said law and regulations do not prevent the use of miscellaneous steel or iron components, subcomponents and hardware necessary to encase, assemble and construct the above products, manufactured products that are not predominantly steel or iron or a minimal use of foreign steel and iron materials if the cost of such materials used does not exceed one-tenth of one percent (0.1%) of the total contract price or $2,500.00, whichever is greater. The Memorandum of Understanding will be incorporated into the project contract by reference or Exhibit.

APPROVED FOR THE OWNER BY:

[Signature]

(City)

APPROVED FOR THE DEPARTMENT BY:

[Signature]

(State)

STATE UTILITIES ADMINISTRATOR

Date: May 10, 2018

Date: 6/7/18

PI # 210327
Pre-Approved Contractor List

Company Name: Cable East Inc.
Address: 1940 Statham Dr. Statham Ga. 30666
Phone: Cell 678-361-4235 Office 706-659-9051
Contact Person: Janie Fong
E-Mail: Jamie.Fong@cable-east.com

Company Name: Cemtrac Services Inc.
Address: 2250 Lithonia Industrial Blvd. Lithonia Ga. 30058
Phone: Cell 239-243-6357 Office 770-934-9595
Contact Person: Ed Patak
E-Mail: ed.patak@comtracinc.com

Company Name: 
Address: 
Phone: 
Contact Person: 
E-Mail: 

Please provide a minimum of three.

Pre-Approved Design Consultant List

Company Name: Source One Corp.
Address: 1700 Water Place Suite-100 Atlanta Ga. 30339
Phone: Office 678-594-5100 Ext-102 Cell 678-848-6350
Contact Person: Ben Blanton
E-Mail: Ben Blanton <bblanton@sourceonecorp.com>

Company Name: KCI Engineering
Address: 4041 Crescent Park Dr. Riverview Fl.33578
Phone: Office-813-385-2896 Cell- 813-416-1719
Contact Person: Aaron Moon
E-Mail: Aaron Moon <Aaron.Moon@kci.com>

Company Name: Vantage Point
Address: 41 Cumberland Street l Ocean Isle Beach l NC 28469
Phone: Office-605-995-1778 Cell 336-688-2124
Contact Person: Farley Davis
E-Mail: Farley.Davis@Vantagepoint.com

PI # 210327
Georgia Department of Transportation

Technical Provisions

For

Design-Build Agreement

P.I. No. 210327-

Attachment 6-2

UTILITY INSURANCE REQUIREMENTS AND SPECIAL PROVISIONS

SP Insurance Protection of Utility Interests
SP 660 Sanitary Sewer System
SP 663 Electric Transmission Systems
SP 664 Electric Distribution Systems
SP 665 Gas Distribution System
SP 670 Water Distribution System
SP 950 Telecommunication Facilities
SP 951 Cable Systems
XYZ Utility Owner is the owner and operator (also herein after referred to as Facility Owner) of a [Facility Size and Type] and/or appurtenant facilities within the project along [Project Description] in [ABC] County, Georgia.

All reference to liability, indemnification, insurance, etc. in this special provision shall apply only to those [Facility Type] located in the required right-of-way areas from station [000+00] to station [000+00] along [Route], these areas having been acquired by the Department.

The contractor shall and does hereby agree to indemnify, save harmless and defend The Facility Owner from the payment of any sum of money to any person whomsoever on account of claims or suits growing out of injuries to persons, including death, or damage to property caused by the contractor, his employees, agents or subcontractors or in any way attributable to the performance and prosecution of the work herein contracted for, including (but without limiting the generality of the foregoing), all claims for injuries to persons or damage to property, liens, garnishments, attachments, claims, suits, costs, attorney's fees, costs of investigation and of defense.

The contractor hereby waives and relinquishes any right of subrogation it might have against the Facility Owner under the provisions of the Workmen's Compensation Act of Georgia or of any other State on account of any injury to its employees or sub-contractor caused in whole or in part by The Facility Owner's transmission facilities. The contractor further agrees that it will require its workmen's compensation insurer, if any, to likewise waive and relinquish such subrogation rights.

I. Insurance

A. In addition to any other forms of insurance or bonds required under the terms of the contract and specification, the contractor will be required to furnish and maintain policies of insurance covering:
(1) The legal liability of the contractor, and his sub-contractors under the Georgia Workmen’s Compensation Act for claims for personal injuries and death to employees engaged in the work.

(2) The legal liability (including contractual) of the contractor, and his sub-contractors who may be engaged in the work, for claims of damages for personal injuries or for death resulting therefrom arising out of the work to be performed under this contract by the contractor, or his sub-contractors, to persons other than employees of the contractor or sub-contractors engaged in the work included in this contract in an amount not less than:

$1,000,000 for any one person  
$2,000,000 for any one accident

(3) The legal liability (including contractual) of the contractor, and his sub-contractors who may be engaged in this work, to pay claims for damages to property belonging to others than such contractor, or his sub-contractors, in the amount not less than:

$1,000,000 for any one accident

B. All of the aforementioned insurance shall be placed with an insurance company which is licensed to do business in the State of Georgia and shall be endorsed to cover the liability assumed by the contractor under the provisions of this contract.

(1) It is understood, however, that the provisions requiring the contractor to carry said insurance shall not be construed as in any manner waiving or restricting the liability of the contractor pursuant to the terms hereof which may not be insured under said insurance policies above required.

(2) As evidence of this insurance, and prior to the beginning of any work in connection with this contract, the contractor shall submit to the department of transportation, State of Georgia, and the Facility Owner a certificate providing the above coverage and which certifies that the said policies have been properly endorsed to meet the above requirements and that the facility owner is named as additional insured.

C. If any part of the work is sublet, similar insurance and evidence thereof, in the same amounts as required of the prime contractor, shall be provided by or in behalf of the sub-contractor to cover his operations, endorsements to the prime contractor’s policies specifically naming sub-contractors and describing their operations will be acceptable for this purpose.

D. All insurance hereinbefore specified shall be carried until all work required to be performed under the terms of the contract has been satisfactorily completed as evidenced by the formal acceptance by the State. Insuring companies may cancel insurance by permission of the State,
The Facility Owner, or on thirty (30) days written notice to the Department and The Facility Owner as follows:

Notice to:
[Title]
[Facility Owner]
[123 Unknown Street]
[City, State Zip Code]

Copy notice to:
State Utilities Engineer
Georgia Department of Transportation
One Georgia Center
600 W. Peachtree St., 10th Floor
Atlanta, Georgia 30308

II. Failure to comply

In the event of cancellation or lapse of insurance policy:

The Facility Owner may require that the contractor vacate the aforementioned Facility Owner’s right-of-way or easement area.

The highway engineer may withhold all monies due the contractor on monthly statements.

Any such orders shall remain in effect until the contractor has remedied the situation to the satisfaction of the Facility Owner’s representative and the highway engineer.

III. Payment for cost of compliance:

No separate payment will be made for any extra cost incurred on account of compliance with this special provision. All such cost shall be included in prices bid for other items of the work.
DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

SPECIAL PROVISION
PROJECT:
COUNTY: Richmond GA and Aiken SC
P.I.: 210327-

Section 660—Sanitary Sewers

Delete Section 660 and substitute the following:

660.1 General Description
This Work consists of furnishing materials, labor, tools, equipment, and other items necessary for installing, removing, abandoning, relocating, and adjusting sanitary sewer and force main systems and appurtenances to the Plans and Specifications.

660.1.01 Definitions
A. General Provisions 101 through 150
B. The term “The Facility Owner” shall be understood to mean “place utility company name” or “add if more than one company”.
C. The term “Project Manager” shall mean the authorized individual having the authority to give instructions pertaining to the work and to approve or reject the work. The “Project Manager” shall not however be authorized to revoke, alter, enlarge, relax, or release any requirements of the Contract, Plans, and Specifications, nor shall they act as an agent for the Contractor. All Contract items pertaining to the Utility Owner shall be coordinated with the Georgia Department of Transportation’s (GDOT) Project Coordinator and the Utility Owner.

660.1.02 Related References
A. Standard Specifications
   Section 104—Scope of Work
   Section 107—Legal Regulations and Responsibility to the Public
   Section 108—Prosecution and Progress
   Section 205—Roadway Excavation
   Section 207—Excavation and Backfill for Minor Structures
   Section 400—Hot Mix Asphaltic Concrete Construction
   Section 444—Sawed Joints in Existing Pavements
Section 500—Concrete Structures
Section 600—Controlled Low Strength Flowable Fill
Section 615—Jack or Boring Pipe
Section 611—Relaying, Reconstructing, or Adjusting to Grade of Miscellaneous Roadway Structures
Section 668—Miscellaneous Drainage Structures
Section 801—Fine Aggregate
Section 810—Roadway Materials

B. Related Documents
   1. General Provisions 101 through 150.
   2. All products supplied and all work performed shall be in accordance with The Facility Owner’s Standard Specifications, applicable standards from American Society for Testing and Material (ASTM), American Water Works Association (AWWA), American National Standards Institute (ANSI), GDOT Utility Accommodation Policy and Standards, and the Georgia Environmental Protection Division (EPD) Guidelines for Sewage Collection Systems. Latest revisions of all standards shall apply.

660.1.03 Submittals
   A. General Provisions 101 through 150.
   B. Refer to The Facility Owner’s Standard Specifications, current published edition, for sanitary sewer utility submittal requirements. Copies of all submittals and documentation shall be submitted to GDOT, who shall distribute to the Utility Owner.

C. Shop Drawings / Product Data
   1. Submit 6 copies of the following submittals to the GDOT Project Coordinator:
      a. Product data, including size, dimension, capacity, pressure rating, accessories, and special features, installation instructions, and operating characteristics for all proposed materials to show compliance with the requirements of this Special Provision.
      b. Test reports specified in the Quality Acceptance section of this Special Provision.
      c. Pipe manufacturer certification of compliance with specifications.
      d. Operation and maintenance literature, warranties, and other specified information.

D. Construction Record Documentation
   1. The Contractor shall record on two sets of utility as-built drawings that will record changes and deviations from the Contract Drawings in sizes, lines or grade. Record also the exact final horizontal and vertical locations of underground utilities and appurtenances to an accuracy of +/- 0.2 ft, referenced to permanent surface improvements. Drawings shall utilize State Plane Coordinates and shall be legibly marked to record actual construction and submitted to the GDOT no later than 30 days after installation and prior to Final Acceptance of the Project. The Utility Owner shall determine if the utility record drawings are complete prior to Final Acceptance of the project.
   2. Record Drawings shall be signed and sealed by a professional engineer or land surveyor registered in the State of Georgia.
   3. Record Drawings shall also be submitted in digital format as indicated in accordance with the Department’s current Electronic Utility File Guidelines.
   4. Except for standard bound materials, bind all 8.5”x11” (A4) documentation, including 11” x 17” (A3) drawings folded to 8.5”x11” (A4), in logical groupings in loose-leaf binders of either the 3-ring or plastic slide-ring type. Permanently and appropriately label each such bound grouping of documentation.

660.1.04 Quality Assurance
   A. The Contractor shall comply with applicable codes, ordinances, rules, regulations and laws of local, municipal, state or federal authorities having jurisdiction over the Project.
   B. Furnish manufactured items, pipe, fittings, valves, service components, and appurtenances from manufacturers having
regularly produced such items as specified herein which have proven satisfactory in actual service, or at least a 2-year period, or as approved by the GDOT and Utility Owner.

C. Regardless of tolerances permitted by industry standards specified herein, GDOT Project Manager may reject pipe or appurtenances at the manufacturing plant or project site which have cracks, chips, blisters, rough interior or exterior surface, evidence of structural weakness, joint defects, or other imperfections that might in the opinion of the Project Coordinators contribute to reduced functional capability, accelerated deterioration or reduced structural strength.

D. The Utility Owner and the Utility Owner’s consultant shall have the right to visit and inspect the work at any time. The Utility Owner may also have an Inspector assigned to the project authorized to inspect portions or all of the utility work done and the preparation, fabrication, or manufacture of the materials to be used. The Utility Owner shall be able to advise GDOT Project Manager of any observed discrepancies or potential problems. The cost of these inspections shall be the responsibility of the Utility Owner.

E. GDOT shall notify the Utility Owner before authorizing any changes or deviations which might affect the Utility Owner’s facilities. Contractor shall notify GDOT and Utility Owner a minimum of 24 hours prior to beginning work on utilities.

F. The Utility Owner shall be notified by GDOT Project Manager when all utility work is complete and ready for final inspection. The Utility Owner shall be invited to attend the final inspection and may provide a corrections list to GDOT Project Manager prior to the final inspection.

G. The Contractor shall verify the actual location and depth of all utilities prior to construction. All utilities and structures shall be protected during construction. Any damaged facilities shall be repaired or replaced at the Contractor’s expense.

660.2 Materials

H. All materials provided shall be in conformance with the requirements and standards set forth in the Facility Owner’s specification document, current published edition.

660.2.01 Sanitary Sewer Piping Systems and Appurtenances

A. Ductile Iron Pipe and Fittings

Ductile iron pipe shall meet the latest edition of ANSI/AWWA C150/A21.50 and C151/A21.51 for the class and joint specified with a nominal laying length of 18 (5.5 m) to 20 feet (6 m). Joints for buried ductile iron pipe shall be mechanical or push-on joints. Unless specified otherwise in the Plans or The Facility Owner’s Standard Specifications, ductile iron pipe diameters 12 inch (300 mm) or less shall be minimum Pressure Class 350, while pipe diameters greater than 12 inch (300 mm) shall be minimum Pressure Class 250.

1. Ductile iron pipe for the interior of structures and above ground installations shall be flanged. Flanges shall be ductile iron and shall be threaded-on flanges conforming to ANSI/AWWA C115/A21.15 or cast-on flanges conforming to ANSI/AWWA C110/A21.10. The minimum class thickness for ductile iron flanged pipe to be threaded is Class 53.

2. Interior surfaces of ductile iron pipe and fittings shall be ceramic epoxy lined. Epoxy lining shall be 40-mil nominal dry film thickness. The interior of the ductile iron pipe and fittings shall not have been lined with any substance prior to the application of the specified lining material and no coating shall have been applied to the first 6 inches (150 mm) of the exterior of the spigot ends. The lining shall be applied by a competent firm with a successful history of applying linings to the interior of ductile iron pipe and fittings. Surface preparation, lining of pipe, coating of bell sockets and spigot ends, number of coats, and touch up and repair shall be in accordance with the manufacturer’s recommendations. The pipe or fitting manufacturer shall supply a certificate attesting that the applicator met the requirements of this specification; that the material used was as specified; that the linings have the nominal dry film thickness specified; and that the linings have no pinholes when tested with a nondestructive 2,500 volt test. Lined pipe and fittings shall be handled only from the outside of the pipe and fittings.

3. Ductile iron shall have an exterior asphaltic coating as specified in AWWA C151 for ductile iron pipe and AWWA C153/C110 for ductile iron fittings.

4. Buried ductile iron pipe and fittings shall be polyethylene encased at locations indicated on the Plans or as conditions warrant. Polyethylene encasement tubing shall be in accordance with ANSI/AWWA C105/A21.5 and ASTM A674
and shall have a minimum thickness of 8 mils. Polyethylene tubing shall be green in color to designate wastewater.

5. **Fittings**: Ductile iron fittings shall be epoxy coated and meet the requirements of ANSI/AWWA C153/A21.53 or ANSI/AWWA C110 A21.10 with a minimum pressure rating of 250 psi. Pressure pipe fittings shall be restrained mechanical joint.

6. **Mechanical Joint Fittings**: Mechanical joints consisting of bell, socket, gland, gasket, bolts, and nuts shall conform to ANSI/AWWA C111/A21.11.

7. **Push-On Joints**: Push-on joints shall be designed in accordance with ANSI/AWWA C111/A21.11. Joint lubrication shall be as furnished by the manufacturer.

8. Rubber gasket joints for push-on or mechanical joints shall conform to the requirements of ANSI/AWWA C111/A21.11.

9. **Restrained Joints**: Restrained joints shall be provided as shown on the Plans and where required for thrust restraint. Restrained joints shall not require field welding or grooves cut into the pipe barrel for restraint. The restraining joints for mechanical joint fittings shall conform to the requirements of ANSI/AWWA C111/A21.11 with assembly in conformance with AWWA C600 and manufacturer’s recommendations. Restrained joints for pipe shall be mechanical joints with ductile iron retainer or push-on type joints and shall have a minimum rated working pressure of 250 psi.

10. Mechanical joint retainer glands may be used to restrain mechanical joint pipe and fittings to the plain end of ductile iron pipe and fittings. Restrainer glands shall be manufactured of ductile iron per ASTM A536.

11. Corrosion-resistant bolts used with ductile iron joints shall be high-strength, low-alloy steel as specified in ANSI/AWWA C111/A21.11.

12. **Welded Outlets**: Welded outlets in ductile iron pipe shall be provided where specified and indicated on the Plans. Outlets shall be fabricated by welding sections of ductile iron pipe manufactured in accordance with ANSI/AWWA C151/A21.51. Welded outlet pipe shall be fabricated only by the pipe manufacturer. The minimum ductile iron pipe thickness for fabrication of welded outlet pipe shall be Thickness Class 53 for 4 inch to 54 inch (100 mm to 1350 mm) diameter pipe. All joints on welded-on branch outlets shall be provided in accordance with the latest revision of ANSI/AWWA C111/A21.11 and/or ANSI/AWWA C115/A21.15 as applicable. After the outlets are welded together and prior to finishing, the assembly shall be subjected to a 15 psi air test for leakage. The maximum size and laying length of the welded-on branch outlets shall be recommended by the pipe manufacturer and acceptable to the Utility Owner for the field conditions and connecting pipe or valve.

### B. Polysylin Chloride (PVC) Pipe

1. C900 PVC pipe diameters 4-inch (100 mm) through 12-inch (300 mm) shall meet ANSI/AWWA C900 requirements, and shall be a minimum pipe dimension ratio (DR) 18. Pressure Class 235 psi. C905 PVC pipe diameters 14-inch (350 mm) and greater shall meet ANSI/AWWA C905 requirements, shall be DR 18 minimum, Pressure Class 235 psi. Pipe shall have a bell with an integral wall section with a factory installed, solid cross section elastomeric ring in accordance with ASTM F477.

2. PVC solid wall gravity sewer pipe shall be integral bell and spigot joint pipe, and shall comply with ASTM D3034 for pipes 15-inch (380 mm) and smaller, with minimum standard dimension ratio (SDR) 26. Pipes larger than 15-inch shall comply with ASTM F679 with the minimum thickness as specified in the Plans or The Facility Owner’s specification document. Joints shall be of the bell and spigot gasketed type in accordance with ASTM D3212 and ASTM F477.

3. All PVC pipe shall be formulated for sunlight exposure and shall be green in color to designate wastewater.

4. PVC pipe shall have the same outside diameter (OD) as ductile iron pipe and be compatible for use with ductile iron fittings.

5. Fittings for PVC pipe 4 inches (100 mm) and larger shall be ductile iron mechanical joint and comply with the requirements set forth in the specifications for Ductile Iron Pipe and Fittings.

6. **Restrained Joints**: Restrained joints shall be provided as shown on the Plans and where required for thrust
restraint. Restrained joints shall comply with the requirements set forth in the specifications for Ductile Iron Pipe and Fittings, with assembly in conformance with AWWA C600 and manufacturer’s recommendations.

7. Unless specified otherwise in the Plans or The Facility Owner’s specification document, 2-inch (50 mm) and 3-inch (80 mm) diameter PVC pipe shall conform to the requirements of ASTM D2241 Class 1120 or 1220 (SDR 21) with a working pressure rating of 200 psi with integral bell gasketed joints. Pipe is to be manufactured to IPS standard pipe equivalent outside diameters.

8. Schedule 80 PVC pipes smaller than 4-inch (100 mm) nominal diameter shall be in accordance with ASTM D1785. Schedule 80 pipe shall have threaded joints. Solvent cemented joints shall not be used. Threaded type fittings for Schedule 80 PVC pipe shall be in conformance with ASTM D2464. All threaded joints shall be watertight.

9. Flanges for Schedule 80 PVC pipe shall be rated for a 150 psi working pressure with ANSI B16.1 dimensions and bolting pattern. Flanges shall be connected to PVC piping with threaded joints in accordance with ASTM D2467 or ASTM 2464, respectively.

C. Fusible PVC Pipe

1. Fusible PVC pipe sizes 4-inch (100 mm) to 36-inch (900 mm) shall conform to AWWA C900/C905 as applicable and follow the dimension ratios (DR) set forth in the requirements listed for C900 PVC pipe.
2. Fusible PVC pipe shall be green in color to designate wastewater.
3. Fusible PVC pipe shall be extruded with plain ends. The ends shall be square to the pipe and free of any bevel or chamfer. There shall be no bell or gasket of any kind incorporated into the pipe.
4. Fusible PVC pipe shall be manufactured in a standard 40-foot nominal length or custom lengths as specified.
5. Joints shall be made by butt fusing sections of pipe with manufacturer-approved equipment.
6. Fittings shall be ductile iron mechanical joint and comply with the requirements set forth in the specifications for Ductile Iron Pipe and Fittings.

D. High Density Polyethylene (HDPE) Pipe

HDPE pipe sizes 4-inch (100 mm) and larger shall be a PE 4710/3408 high density, extra-high molecular weight polyethylene manufactured from first-quality high density polyethylene resin containing no additives, fillers, or extenders. The HDPE pipe shall have an ASTM D3350 cell classification of PE 445574C, and shall meet the requirements of AWWA C906, and shall be sized based upon the ductile iron pipe size (DIPS), outside diameter (OD) sizing system. HDPE shall be a minimum DR 11, pressure class 160 psi. For gravity sewer pipe, the DR of the pipe shall be as indicated in the Plans or The Facility Owner’s Standard Specifications.

1. HDPE pipe shall be green or marked with a permanent green stripe to designate wastewater.
2. Joints shall be made by butt fusing sections of pipe with manufacturer-approved equipment.
3. Fittings shall be ductile iron mechanical joint meeting the requirements of ANSI/AWWA C110/A21.10 and ANSI/AWWA C111/A21.11.
4. The pipe shall have fusion welded restrainer ring, follower gland, and a 12-inch (300 mm) stainless steel insert for the mechanical joint connection.
5. HDPE sewer mains shall be properly sized utilizing the inside diameter of the nominal pipe diameter. If during construction HDPE is substituted for other pipe materials, the Contractor shall verify that the inside diameter of the HDPE is the same or larger than the inside diameter of the pipe originally specified.

E. Concrete Pipe

1. Concrete pipe for gravity sewers shall be epoxy lined, reinforced concrete bell and spigot pipe with type two cement and calcareous aggregate conforming to ASTM C76 for Wall C pipe. Pipe shall be supplied in lengths of at least eight feet (2.5 m).
2. Pipe shall have rubber gasket type joints with steel end rings conforming to ASTM C443. A rectangular groove shall be supplied in the spigot end to receive the rubber gasket, and it shall be so formed to a rectangular shape and confined on all four sides. Bell and spigot surfaces shall be accurately formed and smooth to provide a close sliding
fit with a nominal clearance of 1/16-inch (1.5 mm).

3. Pipe shall not have cracks, blisters, imperfect surfaces, damaged ends, or damaged gasket grooves. Repaired or patched pipe or pipe with repaired or patched gasket grooves or shoulders shall not be used.
4. The testing of concrete pipe for crushing strength, absorption, hydrostatic requirements, and permeability shall be at the direction of the Utility Owner/GDOT Project Coordinators and shall be performed in accordance with ASTM C497.

F. Steel Casing Pipe
1. All materials, design, fabrication, handling, and testing of steel casing pipe shall conform to the requirements of ASTM A139, AWWA C200 and AWWA Manual M11 "Steel Pipe – A Guide for Design and Installation."
2. Steel casing pipe shall be new, smooth-wall, carbon steel pipe conforming to ASTM Specification A139, Grade B with minimum yield strength of 35,000 psi. Steel casings shall be used with the size, minimum thickness, length, and coating specified on the Plans or The Facility Owner's specification document.
3. Additional anti-corrosion measures, as specified by the manufacturer or indicated on the Plans, shall be provided at connectors, couplings, rollers, restraints, etc.
4. Unless specified otherwise in the Plans or The Facility Owner’s specification document, casing pipe end seals shall consist of 1/4-inch (6 mm) thick flexible synthetic rubber boot with adjustable stainless steel banding straps. The annular space of the casing shall not be filled with concrete or grout.
5. Casing spacers shall consist of a stainless steel shell, PVC ribbed liner, and non-conducting separators to keep the carrier pipe from touching the casing pipe. Spacers shall be provided at a maximum of 10-foot intervals and within 2 feet (0.6 m) of the end of the casing pipe.

G. Cured-In-Place-Pipe (CIPP) Liners
1. CIPP liners shall be installed at the locations indicated on the Plans for the renovation of existing sanitary sewer pipes. The CIPP process shall consist of furnishing and inserting a resin-impregnated flexible tube within an existing sanitary sewer pipe and permanently forming the tube to the original conduit by curing with hot water under hydrostatic pressure or by a compressed air/stream combination.
2. CIPP pipeliner components shall be made from approved materials and manufactured in accordance with ASTM F1216, ASTM F1743, ASTM D5813, and ASTM D790.
3. CIPP tube shall meet the following criteria:
4. Made up of one or more layers of felt fabric
5. Meets or exceed ASTM F1216 or ASTM F1743, Section 5
6. Withstands installation pressure and is strong enough to bridge missing pipe sections where necessary.
7. Stretches to fit irregular pipe sections
8. After wetout (impregnating of the tube with resin), shall maintain a uniform thickness meeting or exceeding the design thickness when compressed at installation pressures
9. Sewn to a size fitting tightly within the internal circumference and length of the original pipe when installed and shall provide required allowance for circumferential stretching during inversion
10. Does not utilize overlapping layers of felt in longitudinal seams causing lumps in the final product
11. Utilizes an impermeable, flexible membrane coated on the outside layer of the tube prior to wetout to contain the resin and facilitate monitoring of resin saturation during the wetout procedure
12. Is homogenous across the entire wall thickness and contains no intermediate or encapsulated elastomeric layers
13. Does not utilize material in the tube causing delamination in the CIPP pipeliner
14. Seams in the tube are stronger than the non-seamed felt
15. Outside of the tube is marked for distance at regular intervals along its length. Marking intervals do not exceed 5 feet (1.5 meters) and include the Manufacturers name or identifying symbol.
16. CIPP resin in system shall produce CIPP pipeliners which comply with the structural and chemical resistance requirements of this specification. Resin systems shall be corrosion resistant, consist of a vinyl ester and catalyst system, and contain 5% or less resin filler. When properly cured within the tube composite, the resin shall meet or
exceed the requirements of ASTM F1216 and ASTM F1743, the physical properties herein, and those which are to be utilized in the design of the CIPP liner.
17. CIPP pipeliners shall meet the following criteria:
18. Requirements of ASTM F1216, Appendix XI.
19. No bonding to original pipe wall assumed
20. Utilizes a long-term, time dependent flexural modulus value obtained from long-term testing results for flexural creep of the CIPP material installed by the installer on previous projects consisting of the same work
21. Utilizes a percentage of the instantaneous flexural modulus value as measured by ASTM D790 testing in design calculation for external buckling. Does not use values in excess of 50% unless substantiated by qualified independent testing laboratory data.
22. Produced using materials of equal quality or better than the materials used in the long-term test with respect to the initial flexural modulus used in design.
23. Utilizes an enhancement factor “K” value of 7 for “partially deteriorated” design conditions. Does not use Enhancement (K) factors in excess of 7 unless substantiated by qualified independent testing laboratory data.
24. Produced with uniformly bonded layers. Any two layers cannot be cleanly separated with a probe or point of a knife blade or separated in a manner that allows the probe or knife to move freely between layers.
25. Produces with light, a reflective interior wall color to allow clear, detailed examination with closed circuit television inspection equipment.
26. Conforms to the structural properties listed in the following table:

<table>
<thead>
<tr>
<th>MINIMUM STRUCTURAL PROPERTIES</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Property</strong></td>
</tr>
<tr>
<td>Modulus of Elasticity</td>
</tr>
<tr>
<td>flexural Stress</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

a. Produced with a minimum wall thickness of 1/4 in (6 mm) throughout the line. Wall thickness is based on the physical properties listed in the table above and the design equations in the appendix of ASTM F1216, using the design parameters listed in the following table:

<table>
<thead>
<tr>
<th>DESIGN PARAMETERS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design Safety Factor</td>
</tr>
<tr>
<td>Retention Factor for Long-Term Flexural Modulus (determined by long-term testing described above)</td>
</tr>
<tr>
<td>Ovality</td>
</tr>
<tr>
<td>Enhancement Factor, k</td>
</tr>
</tbody>
</table>
b. Layers of the tube not saturated with resin prior to insertion into the existing pipe are not included in the structural CIPP pipeliner wall thickness computation.

c. Meets or exceeds chemical resistance requirements of ASTM F116, Appendix X2

d. Contains no dry or saturated layers

H. Pipe Detection Wire

Unless otherwise specified in the Plans or The Facility Owner’s Standard Specifications, open cut installations of non-metallic pipe shall include minimum #12 gauge tracing wire. Pipe installed by directional drill shall include two (2) insulated 8 gauge tracer wire. Wire shall be solid copper insulated with HDPE installed along pipe, wrapped around service line stub outs and stubbed into valve boxes for locating purposes. Wire shall be properly spliced to provide continuous conductivity.

I. Warning Tape

Sanitary sewer mains shall be installed with polyethylene film warning tape manufactured for marking and identifying underground wastewater utilities. Tape shall be a minimum of 2 inches (50 mm) wide and 4 mils thick, green in color, with continuously printed letters reading “CAUTION BURIED SEWER LINE BELOW”.

J. Gate Valves

1. Gate valves sizes 3-inch (80 mm) and larger shall be of the resilient seat type meeting the requirements of AWWA C509 or C515. Valves shall be iron body, bronze trimmed, with non-rising stems, and shall be fusion-bonded epoxy coated per ANSI/AWWA C550. Valves shall have a minimum design working pressure of 200 psi.

Valves shall be manually operated by nut and open counter-clockwise unless specified otherwise in the Plans or The Facility Owner’s Standard Specifications.

2. The resilient seating arrangement shall provide zero leakage at the design working pressure when installed with line flow in either direction. All ferrous surfaces inside and outside shall have a fusion bonded epoxy coating. All valves shall be provided with O-ring seals. The design and machining of valves shall be such as to permit replacing the O-ring seals in the valves while in service without leakage.

3. All gate valves, when fully opened, shall have an unobstructed waterway diameter equal to or larger than the full nominal diameter of the valve.

4. In general, valves shall be designed for vertical installation. Valves installed in the horizontal position shall be provided with bevel gears, extended gear case, rollers, tracks, and scrapers.

5. Exposed or above-ground gate valves shall be outside screw and yoke (OS&Y) flanged joint type with an operating hand wheel. The face-to-face dimensions and drilling shall conform to ANSI B16.10 for Class 125 flanged joint end gate valves.

6. Valves shall include mechanical joints, bolts, glands, gaskets, and all other materials necessary to join to existing work.

7. Provide brass identification tag imprinted with “SEWER”, valve size, valve type, and direction and number of turns to open. Provide a ¼-inch (8 mm) hole in the brass tag and attach the tag to the end of the locate wire (twist wire around tag). Tag shall be 2-inch (50 mm) diameter and ¼-inch thick brass with a ¼-inch (8 mm) hole.

K. Insertion Valves

1. Insertion type valves shall be resilient wedge gate valves designed to be installed into an existing pressurized force main without interruption of flow through the pipe and no reduction of line pressure.

a. Valve shall be fusion-bonded epoxy coated in compliance with AWWA C550.

b. The construction of the resilient wedge shall comply with AWWA C509 requirements.

c. The resilient wedge shall be fully encapsulated with EPDM rubber and shall seat on the valve body and not the pipe. The resilient wedge shall be totally independent of the carrier pipe.

d. Valve shall be restrained to the pipe.

e. Valves shall be suitable for operating pressures up to 250 psi.
L. Plug Valves
   1. All plug valves shall be of the non-lubricated eccentric type with resilient faced plugs and shall comply with AWWA C517 requirements. The pipe connections shall be flanged or mechanical joint as required. Flanged valves shall be in accordance with ANSI B16.1, Class 125 and ANSI B16.5, Class 150. Mechanical joint valves shall be in accordance ANSI/AWWA C111/A21.11. Buried plug valves shall have mechanical joint ends. Valve and gearing shall be rated for a minimum of 150 psi pressure rating.
   2. Valves shall be coated with an epoxy coating applied to both the exterior and the interior surfaces prior to assembly of the valves.
   3. Unless specified otherwise in the Plans or The Facility Owner’s Standard Specifications, the port area shall be 100% of standard full pipe area. The body of the valve shall be constructed of cast iron ASTM A126 Class B. Valves shall be furnished with permanently lubricated stainless steel or oil-impregnated bronze upper and lower plug stem bushings. These bearings shall comply with current AWWA Standards. Both nut and gear operated valves shall have a 2-inch (50 mm) square nut for operation.
   4. Provide brass identification tag imprinted with “SEWER”, valve size, valve type, and direction and number of turns to open. Provide a ¼-inch (8 mm) hole in the brass tag and attach the tag to the end of the locate wire (twist wire around tag). Tag shall be 2-inch (50 mm) diameter and ¼-inch (6 mm) thick brass with a ¼-inch (8 mm) hole.

M. Check Valves
   1. Swing check valves sizes 4-inch (100 mm) through 30-inch (750 mm) shall be constructed of a cast iron body with a bronze seating, and a noncorrosive shaft for attachment of weight and lever. Check valves shall comply with AWWA C508 requirements and have a 150 psi minimum pressure rating.
   2. The valve disc shall swing completely clear of the waterway when valve is fully open, permitting full flow. The disc shall be cast iron, rubber faced.
   3. Check valves shall be flanged in accordance with ANSI 16.1, Class 125, and installed inside a vault or pit.
   4. Provide brass identification tag imprinted with “SEWER”, valve size, valve type, and direction and number of turns to open. Provide a ¼-inch (8 mm) hole in the brass tag and attach the tag to the end of the locate wire (twist wire around tag). Tag shall be 2-inch (50 mm) diameter and ¼-inch (6 mm) thick brass with a ¼-inch (8 mm) hole.

N. Tapping Sleeves and Valve Assembly
   1. Tapping sleeves and valves sizes 4-inch (100 mm) and larger shall be stainless steel with wraparound gasket style, or ductile iron of the split-sleeve, mechanical joint type. Tapping sleeves shall be rated for a minimum 150 psi working pressure in accordance with ANSI/AWWA C110/A21.10.
   2. When tapping an existing asbestos cement pipe, a stainless steel tapping sleeve which contains a full gasketed surface within the sleeve body shall be used due to variances in the manufactured outside diameter of the asbestos cement pipe.
   3. Tapping sleeve shall have an outlet flange per ANSI B16.1, Class 125 standard.
   4. The Contractor shall determine the outside diameter of the existing main before ordering the sleeve.
   5. Tapping valves shall be mechanical joint outlet, non-rising stem, resilient seated gate valves meeting the applicable requirements of ANSI/AWWA C509/C515 and C550 with a minimum design working pressure of 200 psi.
   6. Tapping valves shall be specifically designed for pressure tapping with sufficient seat opening to allow full diameter taps to be made.
   7. Tapping valves shall be manufactured with an integral tapping flange having a raised lip design.
   8. Tapping valves shall be furnished with a combination flange and mechanical joint for connecting the branch to the main.

O. Valve Boxes
   1. All valves shall be equipped with valve boxes. The valve boxes shall be heavy, roadway type boxes. The valve box
cover shall be marked “SEWER VALVE” or “SEWER”.

2. Valve box materials shall conform to the requirements and standards set forth in The Facility Owner’s Standard Specifications.

3. The valve boxes shall be adjustable up or down from the nominal required cover over the pipe. Extensions shall be provided as necessary. A precast concrete ring shall be placed around the valve box opening when outside of paved areas.

4. Valves shall be furnished with extension stems as necessary to bring the operating nut to within 24 inches (600 mm) minimum of the top of the valve box.

P. Tapping Saddles

1. Tapping saddles shall have ductile iron or bronze body with stainless steel, double-tie straps and nuts with pressure rating not less than that of the pipe to which it is to be connected.

2. Saddles shall have a rubber gasket cemented to the body with compatible threading between the saddle and corporation stop. Saddles shall conform to ANSI/AWWA C800 standards.

3. The tapping saddle shall provide full support around the circumference of the pipe, providing a bearing area of sufficient width so that pipe will not distort when the saddle is tightened.

Q. Concrete Vault

1. Concrete vaults shall conform to the requirements and standards set forth in The Facility Owner’s Standard Specifications and standard details.

R. Air Release Valves

1. Air release, air/vacuum valves, and combination air valves shall be suitable for use with wastewater and manufactured in compliance with ANSI/AWWA C512.

2. Air release valves shall have a small venting orifice to vent the accumulation of air and other gases in the line or system under pressure.

3. Air/vacuum valves shall have a large venting orifice to permit the release of air as the line is filling or relieve the vacuum as the line is draining or is under negative pressure.

4. Combination air valves shall have operating features of both the air/vacuum valve and air release valve.

5. Valves shall be suitable for pressures up to 250 psi.

6. Air release, air/vacuum valves, and combination air valves shall conform to the requirements and standards set forth in The Facility Owner’s Standard Specifications and standard details.

S. Thrust Collars and Thrust Blocks

1. Concrete used for thrust collars or thrust blocks on force mains shall meet the “Class A” requirements for concrete listed in Section 500.

2. Thrust collars shall include welded-on collars attached by the pipe manufacturer or retainer glands. Concrete shall be poured continuous around the pipe and bear against undisturbed earth.

3. Reinforcing steel shall meet the requirements set forth in the Plans or The Facility Owner’s Standard Specifications.

4. Mechanical joint restraints shall be utilized in lieu of thrust blocks with the approval of the Utility Owner.

T. Manholes

1. Manholes shall be precast concrete or as indicated in the Plans and per The Facility Owner’s Standard Specifications.

2. The minimum diameter for manholes shall be 48 inches (1200 mm). The minimum diameter for inside drop manholes shall be 60 inches (1500 mm). Manhole Types and Classes are described in Section 668.

3. Precast reinforced manholes shall be manufactured in accordance with ASTM C478 and shall have a minimum wall
thickness of 5 inches (127 mm). All concrete shall have a minimum compressive strength of 4,000 psi when tested in accordance with ASTM C478.

4. The bases shall be monolithically cast and shall consist of a manhole bottom and a wall which shall extend a minimum of 6 inches (150 mm) above the top of the highest in-flowing sewer. The top of the base section shall be tongue and groove section.

5. There shall be a minimum distance of 6 inches (150 mm) between the invert of the lowest outflowing sewer and floor of the precast base to provide for the construction of a formed invert and bench wall within the manhole. There shall be a minimum 0.05-foot drop between the inlet and outlet inverts. Inverts shall be constructed of 4,000 psi plant mix concrete. Bench shape and discharge of force mains into manholes shall conform to the requirements of the Georgia EPD Guidelines for Sewage Collection Systems.

6. Joints between precast sections shall be sealed by means of rubber O-ring gaskets or flexible butyl rubber sealant.

7. Manholes shall have factory applied coatings on the interior and exterior. Surface preparation and coating application shall comply with the manufacturer's recommendations.

8. Manhole sections shall be rejected if abused during shipping or placement and if pipe openings are not properly aligned.

9. A protective coating or lining for corrosion protection shall be applied to all interior surfaces of manholes when called for in the Plans or the Facility Owner's Standard Specifications.

10. Pipe entry holes shall be either precast or cored. Connections between reinforced concrete manhole structures and sewer pipe shall be flexible connectors conforming to ASTM C923 latest revision.

11. Frame and covers shall be cast or ductile iron and set in a bed of mortar on the top of the manhole and flush with finished grade. Covers shall be marked as indicated in the Utility Owner standard details.

12. Watertight manhole rings and covers are to be used if the manhole is located within the 100-year floodplain boundary or may be flooded by street runoff.

13. Riser adjusting rings shall be a minimum of 3 inches (80 mm) on cone sections. Manhole adjustment rings shall be sealed with a flexible rubber seal.

14. Drop manhole: Inside or outside drop inlets shall be provided into sanitary sewer manholes for incoming lines having inverts 2 feet (0.6 m) or more above the inverts of the manhole outlet lines. Drop pipes shall be the same size as the sewer that they serve. Openings in walls of precast concrete manholes for outside drop connections shall not be made at joints. Outside drop piping materials and encasement/embedment shall be as indicated in the Plans. Concrete used to encase the outside drop piping shall be 4,000 psi plant mix concrete unless otherwise indicated on the Plans.

660.2.02 Delivery, Storage, and Handling

A. Handle pipe, fittings, valves, and accessories carefully to prevent damage. Handle pipe by rolling on skids, forklift, or front end loader. Do not use material damaged in handling. Slings, hooks, or pipe tongs shall be padded and used in such a manner as to prevent damage to the exterior coatings or internal lining of the pipe. Do not use chains in handling pipe, fittings, and appurtenances.

B. To unload pipe, carefully lift and lower it into position using approved padded slings, hooks, or clamps. Furnish equipment and facilities for unloading, handling, distributing, and storing pipe, fittings, valves, and accessories. Make equipment available at all times for use in unloading. Do not roll, drop, or dump materials. Any materials dropped or dumped shall be subject to rejection without additional justification.

C. Stored materials including salvaged materials shall be kept in suitable areas safe from damage. The interior of all pipe, fittings, and other appurtenances shall be kept free from dirt or foreign matter at all times. Store and support plastic pipe to prevent sagging and bending. Store plastic pipe and gaskets to prevent exposure to direct sunlight. Valves shall be stored and protected from damage by freezing.

D. Pipe shall not be stacked higher than the limits recommended by the manufacturer. The bottom tier shall be kept off the ground on timbers, rails, or concrete.

660.3 Construction Requirements
660.3.01 Personnel
A. General Provisions 101 through 150.
B. Construction and installation of all wastewater utilities shall be performed by a Contractor prequalified/registered with GDOT.
C. All work specified in this section shall be performed by a Contractor with a valid Utility Contractor’s license issued by the State of Georgia. Sewer service line installation shall be performed by either a Utility Contractor licensed in the State of Georgia or by a Master Plumber licensed in the State of Georgia.

660.3.02 Equipment
A. Ensure all equipment used is in conformance with the requirements and standards set forth in The Facility Owner’s Standard Specifications.

660.3.03 Preparation
General Provisions 101 through 150.

660.3.04 Fabrication
General Provisions 101 through 150.

660.3.05 Construction
A. Finding Existing Underground Utilities and Obstructions
2. According to the best information available to GDOT, all known sewer lines, water lines, gas lines, telephone conduits, drainage structures, etc. are shown on the Plans. However, to find such installations, use an electronic pipe and cable finder for locating existing installations or obstructions to the work.
3. Obtain approval from GDOT Project Manager and the Utility Owner prior to disruption of wastewater services required for the installation of the facilities shown on the project Plans.

B. Jack and Bore
Comply with Section 615 for sewer main installations by jack and bore.

C. Directional Drilling
1. Install sewer mains and services by means of directional drilling at locations shown on the Plans or where approved by GDOT or Utility Owner. Provide submittals and follow all relevant procedures and requirements set forth in The Facility Owner’s Standard Specifications.
2. The Contractor shall not initiate horizontal directional drilling until all submittals are received, reviewed, and accepted by GDOT and the Utility Owner, and all required permits are obtained.
3. The Contractor shall select drilling additives and fluid mixture proportions to ensure continuous circulation, bore stability, reduce drag on the pipe, and completely fill the annular space between the bore and the pipe to ensure stability and control settlement.
4. The Contractor shall submit contingency plans for remediation of potential problems that may be encountered during the drilling operations. The contingency plans shall address the observations that would lead to the discovery of the problem and the methods that would be used to mitigate the problem. Potential problems that shall be addressed include:
   a. Loss of returns/loss of circulation of drilling fluid.
   b. Encountering obstruction during pilot bore or reaming/pullback.
   c. Drill pipe or product pipe cannot be advanced.
   d. Deviations from design line and grade exceed allowable tolerances.
   e. Drill pipe or product pipe broken off in borehole.
f. Product pipe collapse or excessive deformation occurs

g. Utility strike.

h. Hydrolock occurs or is suspected.

i. Excessive ground settlement or heave of ground surface or existing utilities.

j. Inadvertent returns/hydraulic fracture or surface spills resulting in drilling fluids entering water or reaching the surface.

5. Pipe damaged in directional drilling operations shall be removed and replaced at no additional expense to GDOT or the Utility Owner.

6. Voids developed or encountered during the installation operation shall be pressure grouted with a grout mix approved by GDOT.

7. Installation shall include a locatable conduit system, with identification markers on each side of GDOT right-of-way where applicable. Two (2) insulated 8 gauge solid copper tracers wire shall be attached to the leading end of the pipe pulling head and shall extend the full length of the installed pipe.

8. The location and alignment of the pilot drill progress shall be continuously monitored for compliance with the proposed installation alignment and for verification of the depth of the bore. Monitoring shall be accomplished by computer generated bore logs which map the bore path based on x, y, z coordinate information provided by the locating/tracking system. Readings or plots shall be obtained on every drill rod, and shall be provided to the Inspector on a daily basis. Deviations between the recorded and design bore path shall be calculated and reported on the daily log. If the deviations exceed tolerances specified elsewhere, such occurrences shall be reported immediately to GDOT. The Contractor shall undertake all necessary measures to correct deviations and return to design line and grade.

9. Upon completion of the directional drill the Contractor shall furnish GDOT and the Utility Owner an as-built drawing along with a report of the monitoring of the drilling fluids during the pilot hole and backreamed hole.

10. Drilling fluid pressures, flow rates, viscosity, and density shall be monitored and recorded by the Contractor. The pressures shall be monitored at the pump. These measurements shall be included in daily logs submitted to GDOT. The Contractor shall document modifications to the drilling fluids, by noting the types and quantities of drilling fluid additives and the dates and times when introduced. The reason for the addition of drilling fluid additives or other modifications shall be documented and reported.

11. Management and disposal of drilling fluids shall be the Contractor’s responsibility. Excess drilling fluids shall be contained at the entry and exit points until recycled or removed from the site. All drilling fluids shall be disposed of in a manner acceptable to the appropriate local, state and federal regulations. The Contractor’s work will be immediately suspended by GDOT whenever drilling fluids seep to the surface other than in the boring entrance or exit pit, or when a paved surface is displaced.

12. Surfaces damaged by the work shall be restored to their preconstruction conditions at no additional cost to GDOT or Utility Owner, and with no increase in contract time.

13. The following items shall be as shown on the Plans, unless otherwise approved in writing by GDOT:

a. Entry / exit points

b. Drill entry/exit angles

c. Pilot bore path
   1) Radius of Curvature
   2) Entry / exit tolerances: Contractor shall be solely responsible for all work necessary to correct excessive deviations from line and grade, including re-drilling, redesigning connections, and acquiring additional easement, at no additional cost to GDOT or Utility Owner and without schedule extension.

14. The pilot bore shall be pre-reamed and reamed using equipment and methods submitted by the Contractor. The Contractor shall completely ream the bore to the final diameter prior to pullback.

15. Pullback: The pipe shall be installed by pulling it into the reamed bore path in a continuous operation, behind a final reaming tool selected by the Contractor. The pipe shall be isolated from excessive torsional and axial stresses by a
swivel device with a pre-established breakaway tensile capacity that is lower than the allowable tensile strength of the pipe. The maximum pull (axial tension force) exerted on the pipelines shall be measured continuously and limited to the maximum allowed by the pipe manufacturer with an appropriate factor of safety so that the pipe or joints are not overstressed. The end of the pipe shall be closed during the pullback operation.

16. Pipelines shall be adequately supported during installation so as to prevent overstressing or buckling. The Contractor shall provide adequate support/rollers along the pipe layout area to support the required length of pipe for the bore. The pipe layout area shall be cleared of all large stones, construction debris, or other foreign objects that could damage the pipe during pullback. The Contractor shall monitor and inspect pipe rollers and method for suspending pipe at entry during the pullback operation to avoid damage to the pipe.

17. The end of the pipe shall be closed during the pullback operation.

18. Each length of pipe shall be inspected and cleaned as necessary to be free of debris immediately before joining.

19. The Contractor shall at all times handle the pipe in a manner that does not overstress or otherwise damage the pipe. Vertical and horizontal curves shall be limited so that wall stresses do not exceed 50% of yield stress for flexural bending of the pipe. If the pipe is buckled or otherwise damaged, the damaged section shall be removed and replaced by the Contractor at his expense. The Contractor shall take appropriate steps during pullback to ensure that the pipe and tracer wires will be installed without damage.

20. If necessary, the pipe shall have water added as it enters the bore to achieve neutral buoyancy and reduce pullback loads and to ensure that adequate internal pressure is maintained at all points to counter balance collapse pressures.

21. The Contractor shall cease pullback operations if the pipe is damaged and shall remove the pipe from the bore and repair the pipe using the manufacturer’s recommended procedure or replace the damaged pipe before resuming installation.

22. Damage to the pipe resulting from manufacturer defects, installation, or grouting is the responsibility of the Contractor, including costs for replacement and labor and materials. To confirm no damage to the pipe, upon completion of pullback, the Contractor shall pull a sphere or pig through the entire length of the pipeline. The pig shall be one inch less in diameter than the internal diameter of the product pipe, capable of allowing water to pass through it, complete with a pulling cable on either side. If the pig or sphere cannot pass through the pipe, it shall be considered collapsed and damaged.

23. After the carrier pipe is completely pulled through the bore, a sufficient relaxation period as recommended by the pipe manufacturer shall be provided before the final pipe tie-in.

24. The Contractor shall conduct a final hydrostatic test of the installed pipeline. Final test shall be in accordance with these specifications. The Contractor shall repair any defects discovered during this test, and repeat until the pipe passes the test.

D. Excavating Trenches

1. The Contractor shall provide all necessary shoring and bracing materials as required to assure safe working conditions and to protect the excavations. The Contractor shall be required to fully comply with all applicable OSHA Excavation Safety Standards. No separate payment shall be made for any special procedure used in connection with the excavation.

2. Excavate trenches to the proper depth and width as follows:
   a. Trench to Grade: Excavated trench bottoms shall be firm, free from boulders, and conform to the established grade. Limit open trench excavation to a maximum of three 300 feet (90 m) ahead of completed backfill.
   b. Care shall be taken not to over excavate except where necessary to remove unstable material, irregularities, lumps, rock, and projections. Unnecessary over excavation shall be replaced at the Contractor’s sole expense and in accordance with Subsection 660.3.05.
   c. Excavation carried below the established grade lines shown or established by the Utility Owner shall be backfilled according to Section 207 and Subsection 660.3.05. Use Class I or Class II Soils (defined in Section 810) and firmly compact the soil.
d. Where the established grade of a trench is in rock, undercut the bottom of the trench by at least 6 inches (150 mm) beneath the pipe or conduit and the greater of 24 inches (600 mm) wider than the pipe/conduit (12 inches or 300 mm each side) or 42 inches (1050 mm) wide, then backfill and compact according to Subsection 660.3.05.

e. Open cut excavation in pavement and pavement patching shall be according to GA Standard No. 1401. Remove the pavement according to Section 444, except no separate payment shall be made for sawed joints.

f. Dewatering: Remove all water from excavations and maintain the excavations free of water while construction therein is in progress. Provide dewatering equipment as necessary to conform to this requirement. Dewatering procedures must meet all state and local regulatory requirements.

3. Minimum Trench Depth

a. Excavate trenches to provide at least 48 inches (1.2 m) cover depth directly above the pipe to the finished pavement surface, sidewalk, grass, etc. unless indicated otherwise on the Plans or by GDOT Project Manager and Utility Owner. In order to avoid existing utilities, it may be necessary for the pipe to be laid shallower or deeper than the minimum cover specified. At such time the Contractor shall not be allowed extra compensation for additional excavation necessary for deeper installations.

b. Side slopes of the trenches shall be as nearly vertical as practicable. Trenches in excess of 5 feet (1.5 m) deep shall either have the trench sides laid back to conform to OSHA requirements for trench safety, if such area is available within the limits of excavation, or, alternatively, trenches deeper than 5 feet (1.5 m) shall be excavated via trench box or shored and braced.

4. Trench Width: Excavate trenches to uniform widths, wide enough to allow proper installation of pipe, fittings, and other materials, a minimum of 6 inches (150 mm) and a maximum of 12 inches (300 mm) each side of the pipe or conduit.

5. Trench Bell Holes: Excavate bell holes deeply and widely enough to make joints and to allow the pipe barrel to rest firmly on the trench bottom.

6. Trench bottom: Excavate and shape trench bottoms to provide uniform bearing and support of pipes and conduits. Shape subgrade to provide continuous support of bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits/pipes. Remove projecting stones, tree roots, debris, and sharp objects along trench subgrade. Abrupt changes in grade of the trench bottom shall be avoided. Unless otherwise indicated in the Plans or The Facility Owner’s Standard Specifications, trenches for force mains shall be graded to avoid high and low points that necessitate air release valves.

7. Excavations may be excavated and refilled either by hand or by machinery. Hand tool excavation shall be conducted where necessary to protect existing utilities and structures.

8. In the event that unsuitable material is encountered at or below the excavation depth specified or shown on the Plans, GDOT Project Manager shall be notified immediately before proceeding with any additional work. Such material shall be removed and replaced with suitable material in accordance with Section 205.

E. Connecting to Existing Mains

1. Connect to an existing main with the appropriate fittings according to the Plans or The Facility Owner’s Standard Specifications and GDOT Project Manager. When making connections under pressure, furnish and use a tapping sleeve and valve assembly or line stop fittings as indicated. Coordinate with Utility Owner 72 hours in advance for wastewater service interruptions and temporary shut-offs. Evening or weekend work may be required to complete direct connections and tie-ins. Connect to existing mains as follows:

a. Before opening new pipeline trenches, locate the various points of connection to be made into existing pipelines. If necessary, uncover pipelines for the Utility Owner and GDOT Project Manager to prescribe the connections and fittings needed.

b. Connect to existing pipelines only to meet operating requirements. Cut existing lines only after obtaining the Utility Owner and GDOT Project Manager’s permission.

c. Provide temporary line stops, associated fittings, and bypass pumping as indicated on the Plans and as necessary.
when cutting and plugging existing sewer mains to prevent service interruptions. Line stop and associated fittings shall be suitable for working pressures of 250 psi.

d. Connections to existing asbestos cement pipe shall be performed as indicated on the Plans or in The Facility Owner’s Standard Specifications. Cutting, removing, handling, and disposing of asbestos cement pipe shall be in accordance with requirements established by EPA, OSHA, GDOT, NIOSH, and the State of Georgia Environmental Protection Division, and any other applicable laws and ordinances.

F. Laying Sewer Mains and Appurtenances

1. Preparing and Handling Pipes
   a. Thoroughly clean the pipe and fittings before laying them. Keep them clean until accepted.
   b. Use suitable tools and equipment. Do not damage the pipe, especially the lining inside the pipe.
   c. Cut pipe in a manner to avoid damage to pipe or lining, leaving a smooth end at right angles to pipe axis. Smooth and bevel edges of cut pipe for push-on, gasket type joints.
   d. Bedding shall be provided as specified by the Utility Owner or pipe manufacturer for the type of conditions encountered. Bedding typically consists of granular soil free of lumps, clods, cobbles, and frozen materials, and shall be graded to a firm-but-yielding surface without abrupt changes in bearing value. Unstable soils and rock ledges shall be undercut from the bedding zone and replaced with suitable material.
   e. Bed pipe on coarse granular material in flat bottom trench with entire pipe barrel bearing uniformly on coarse granular material, except for an approximately 18-inch (450 mm) gap at pipe balance point for sling removal. Hand excavate and backfill as required to provide uniform and continuous bearing and support for the pipe. Do not support pipe on hubs or end bells. Consolidate coarse granular material under and around pipe up to pipe centerline by tamping.
   f. Join pipe with bells facing direction in which laying operation is progressing. Lay pipe upgrade wherever line grade exceeds 10%.
   g. Carefully examine pipe for cracks and other defects and do not lay defective pipe. If pipe or castings appear to be cracked, broken, or defective after laying, remove and replace those sections.

2. Alignment and Gradient
   a. Ensure that pipe alignment and gradient are according to the lines and grades on the Plans. Pressure pipe alignment shall be either straight or deflected to closely follow true curves. Deflect pipe lines only where required, within allowable horizontal and vertical deflection angles according to the manufacturer.
   b. Sewers shall be laid at least 10 feet (3 m) horizontally from any existing or proposed water main. The distance shall be measured edge-to-edge. When local conditions prevent a horizontal separation of 10 feet (3 m), the sewer may, on a case-by-case basis, be laid closer to a water main provided the water main is in a separate trench or on an undisturbed earth shelf located on one side of the sewer at such an elevation that the bottom of the water main is at least 18 inches (450 mm) above the top of the sewer.
   c. Maintain a vertical separation of at least 18 inches (450 mm) between the crown of sanitary sewers and the invert of existing or proposed water mains with the sewer main located below the water main.
   d. Where a vertical separation of 18 inches (450 mm) cannot be provided, and the sewer main cannot be relocated to provide adequate clearance, the section of sewer main passing over or under water mains shall be constructed of materials and with joints that are equivalent to water main standards of construction and in accordance with Section 670, or the sewer line shall be encased in a watertight carrier pipe in accordance with Section 670, extending 10 feet (3 m) on both sides of the crossing measured perpendicular to the water main and shall be pressure tested to assure water-tightness to 150 psi prior to backfilling.

3. Special Requirements for Laying Sewer Mains
   a. Excavate, clean, lay, joint, and backfill progressively and uniformly according to these requirements:
      1) Never leave pipe in the trench overnight without completely jointing and capping.
      2) Do not leave completed pipeline exposed in the trench. Backfill and compact the trench as soon as possible after laying, jointing, and testing are complete.
3) At the close of work each day and when laying pipe, close the exposed end of the pipeline in the trench with an approved wood or metal head or barrier.
4) If necessary to cover the end of an incomplete pipeline with backfill, close the end of the pipe with a satisfactory cap or plug.

G. Installing Sewer Mains by Open Cut

1. Use the following flexible joints for connections inside the roadway shoulders or curbs and gutters:
   a. Mechanical Joints
      1) When using mechanical joints, thoroughly wash bell sockets, spigots, gland, gasket, nuts, and bolts with soapy water before assembly. Keep these parts wet until the jointing operation is complete.
      2) Tighten nuts within the torque range recommended by the manufacturer. Check the tightening tolerance with a torque wrench.
      3) If effective sealing is not attained at the maximum recommended torque, disassemble, thoroughly clean, and then reassemble the joint.
      4) Do not overstress bolts to compensate for improper installation or defective parts.
   b. Push-On Type Joints
      1) Use push-on joints made according to the manufacturer’s recommendations.
      2) Install PVC pipe in accordance with AWWA C605.
      3) Install ductile iron pipe in accordance with AWWA C600.

2. Restraints for pipe joints and fittings shall be provided as specified and as shown on the Plans. Restraints shall be installed per manufacturer’s recommendations.

3. Buried ductile iron pipe and fittings shall be polyethylene encased as specified and as indicated on the Plans. Polyethylene encasement tubing shall be secured with polyethylene tape and installed in accordance with ANSI/WWA C105/A21.5.

4. Unless otherwise specified by The Facility Owner’s Standard Specifications, provide pipe detection wire on all non-metallic pipe systems. Tape the tracer wire to the top center of the pipe at intervals which prevent wire displacement during backfilling operations. Stub tracer wire up 6 inches (150 mm) above finished grade at all valves. For splices, use direct bury kits. After backfilling is complete, test electrical continuity of each tracer wire segment and provide test results to Utility Owner and GDOT Project Manager.

5. Install continuous underground warning tape during backfilling of trench for underground water distribution piping. Install 12 inches (300 mm) below finished grade, or 6 inches (150 mm) below subgrade under pavements and walkways, and buried directly over piping.

6. Use pipe cutters when cutting pipe or special castings. Do not use a hammer, chisel, or a cutting torch.

7. Force mains that do not meet minimum depth of cover, vertical clearance requirements, or other installation requirements at special locations (e.g. creek crossings) shall include concrete encasement. Concrete encasement shall be installed per The Facility Owner’s Standard Specifications.

8. If HDPE pipe is to be installed where high groundwater table or water surrounding the pipe is expected, precautions shall be taken to provide neutral buoyancy to prevent flotation or a change in alignment.

9. Valves on Sewer Mains: Install and joint gate, plug, and check valves in accordance with AWWA C600. Include the valve box and valve marker where required.

10. Air release valves shall be installed at high elevation points on the force main and at locations indicated on the Plans. Air release valves shall be installed in accordance with manufacturer’s recommendations.
    a. Unless specified otherwise in the Plans or The Facility Owner’s Standard Specifications, air release valves shall be installed in a shallow manhole or vault. Automatic air relief valves shall not be used in areas where flooding of the manhole or vault may occur.
    b. An isolation valve shall be installed between the air release assembly and the connection to the main.
    c. The Contractor shall furnish and install at no additional cost to GDOT or Utility Owner all necessary fittings.
for the installation of air release valves at high points.

11. Thrust Collars and Thrust Blocks: If required, furnish materials and install thrust collars or concrete blocking along force mains as indicated in Subsection 660.2.01. Form and pour concrete thrust collars or blocks in accordance with the Plans and The Facility Owner’s Standard Specifications. Blocking shall be poured against undisturbed earth and all forms shall be removed before backfilling.

12. Backfilling
   a. Furnish equipment, labor, and when necessary, suitable material to conform with The Facility Owner’s Standard Specifications required for backfilling the pipe line trenches according to Section 207, and as follows:
      1) When testing for leaks in open trenches, do not backfill until testing is complete and leaks are eliminated.
      2) When retaining pavement adjacent to trenches, replace removed pavement with the same or better material when approved in accordance with the appropriate Section for the pavement type replaced.
      3) Place backfill on subgrades free of mud, frost, snow, or ice.
      4) Place and compact bedding course on trench bottoms and where indicated. Shape the bedding course to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits/pipes.
      5) Backfill shall include Class I or Class II Soils as defined in Section 810 or suitable material that conforms with The Facility Owner’s Standard Specifications.
      6) Backfill shall be placed in two stages: first, side fill to a height of 12 inches (300 mm) above the top of pipe; second, overfill to former surface grade. Side fill shall consist of granular material laid in 6-inch (150 mm) layers each consolidated by mechanical tamping and controlled addition of moisture, to a density of 95% as determined by the Standard Proctor test (AASHTO T-99 Method D) or GDT 67. Overfill shall be layered and consolidated to match the entrenched material in cohesion and compaction. The top 12 inches (300 mm) shall be compacted to 100% of specified density. Consolidation by saturation or ponding shall not be permitted.
      7) Soil Moisture Control: Uniformly moisten and aerate subgrade and each subsequent fill or backfill soil layer before compaction to within 2% of optimum moisture content. Remove and replace, or scarify and air dry, otherwise satisfactory soil material that exceeds optimum moisture content by 2% and is too wet to compact to specified dry unit weight.
      8) Initial backfill shall be carefully compacted under pipe haunches and evenly up on both sides and along the full length of piping or conduit to avoid damage or displacement of piping or conduit. Place and compact fill and backfill of satisfactory soil to final subgrade elevation. Backfill voids with satisfactory soil while removing shoring and bracing and/or trench boxes.
      9) After backfilling, maintain temporary surface restoration per GA Standard No. 1401 until permanent repaving is complete. No separate payment shall be made for replaced pavement.

H. Installation of Manholes
   1. Each manhole location within the trench shall be over excavated to receive a minimum of 8 inches (200 mm) of No. 57 stone to establish a firm foundation for the manhole. Where the excavation reveals an unsuitable foundation, whether rock or muck, the Contractor shall remove unsuitable material and install No. 57 stone in 6-inch (150 mm) lifts to a maximum of 2 feet (0.6 m) as a foundation for the structure.
   2. All manholes shall be installed plumb.
   3. Horizontal joint sealant protruding into the manhole shall be cut smooth against the interior wall. Interior joints shall not be grouted unless otherwise directed.
   4. Exterior wrap shall be installed centered over joints between manhole sections. Exterior manhole wall shall be clean prior to installing wrap.
   5. Backfill adjacent to manholes shall be mechanically compacted in 12-inch (300 mm) lifts symmetrically around the perimeter of the manhole up to the frame and cover, and in accordance with Subsection 660.3.05.
   6. Manholes shall be set flush with finished pavement grades where located beneath roadways, sidewalks, or other paved surfaces.
7. All lifting holes or equipment mounting holes shall be filled completely and made watertight per manufacturer’s recommendations.

I. Connections to Existing Manholes
   1. Whenever new sewers are connected to existing manholes, pipe openings shall be core drilled with approved equipment to accommodate new pipe. Such connections to existing manholes shall be installed in accordance with manufacturer’s recommendations for neoprene boot, link seal or equal. All cuts shall be coated with an appropriate protective coating.
   2. The bottom of the manhole shall be reworked and shaped to accommodate the new connections.

J. Laying Sewer Laterals and Appurtenances
   1. Except as modified in this Section, construct and install sewer laterals according to the Plans and the requirements for laying sewer mains. Install service lines at locations shown on the Plans or where designated by the Utility Owner and GDOT Project Coordinators.
   2. Trench depth and backfill cover may be adjusted at the discretion of the Utility Owner and GDOT Project Coordinators to provide at least 18 inches (450 mm) of cover.
   3. Install wyes or tees in the locations shown on the Plans for connection of existing or future service lines. Install laterals with proper grade and alignment to the property line shown on the Plans.
   4. New laterals shall extend from the sewer main to the edge of the right-of-way (no more than 5 feet (1.5 m) from the edge of the right-of-way line) where they shall be plugged using a stopper of appropriate size. Sewer laterals shall be tapped into sewer trunk lines using the appropriate tapping machine.
   5. Laterals shall be bedded and backfilled in accordance with bedding requirements shown on the Plans and specified herein.
   6. Lateral connections shall not be made by knocking a hole in the main or manhole, inserting the lateral pipe, and sealing with grout.
   7. Unless otherwise indicated in the Plans or The Facility Owner’s Standard Specifications, sewer laterals shall be a minimum of 6 inches (150 mm) in diameter and shall extend from the main and terminate with a clean-out constructed at the edge of right-of-way.

K. Cutting and Capping Existing Sewer Mains
   Disconnect by sawing or cutting and removing a segment of existing pipe where cutting and capping or plugging is shown on the Plans or directed by The Facility Owner’s or GDOT Project Coordinators. Provide a watertight pipe cap or plug and restraint mechanism to seal off existing mains indicated to remain in service. If sewer main is to be abandoned or removed and not specified to be grout filled, seal ends with a pipe cap or plug or with a masonry plug and minimum 6-inch (150 mm) cover of concrete on all sides around the end of the pipe.
   1. The Contractor shall be responsible for uncovering and verifying the size and material of the existing main to be capped or plugged.
   2. Abandoned manholes and sewer mains larger than 6 inches (150 mm) shall be removed or filled with flowable fill per Section 600 at the locations indicated on the Plans. Air release valves along abandoned pressure pipe shall be plugged prior to grouting. Prior to backfilling, the bottom of the manhole shall be broken up in such a manner that water will readily pass through and all pipes entering the manhole shall be plugged or grout filled. The top portion of the manhole structure shall be removed in order to establish a minimum of 3 feet cover from subgrade or finished grade when not under the pavement and filled with sand or suitable backfill.
   3. Sewer mains shall be cleaned prior to placement of flowable fill. Use concrete or grout pumps capable of continuous delivery at planned placement rate with sufficient pressure to overcome friction and fill the sewer main.

L. Cured-In-Place Pipe (CIPP) Liner Installation
   1. Work shall only be performed by personnel trained, experienced, and skilled in the CIPP process.
2. Bypass Pumping: Provide bypass pumping for the flow of sewage around the section or sections of pipe designated for renovation. Accomplish bypass pumping by plugging the line at an existing upstream manhole and pumping the flow into a downstream manhole. Pump sizing shall be adequate to handle the flow. Provide bypass pumping during pre-installation and post-installation video inspections and during the CIPP liner installation.

3. Pre-Installation: Inspect pipelines for breaks, obstacles, and service connections by close circuit television (CCTV) and produce permanent video record (DVD). Camera used for inspection shall be equipped with rotating head that is capable of 90 degree rotation for horizontal and 360 degree rotation about its centerline and has a minimum resolution of 400 vertical lines and 460 horizontal lines. Camera shall be operative in 100% humidity. Utilize power winches, TV cable, and power rewinds to move camera through sewer line at a speed less than 30 feet (10 m) per minute. Provide voice over description on the video with stationing of services and areas for point repair indicated on the video. Inspect interior of pipeline to determine existing conditions that may prevent proper installation of the CIPP liner. Designate areas for point repair by evaluating any obstructions that can’t be removed by conventional sewer cleaning equipment such as a protruding service connection, dropped joint, or collapse. Confirm locations for all branch service connections. Transfer procession and property rights of the inspection video record to the Utility Owner.

4. Cleaning: Clear the line of all solids and roots. Remove all internal debris from the sewer line to prevent interference with the CIPP. Properly dispose of all debris removed from the sewer line.

5. Point Repair: Excavate and repair any protruding service connection, dropped joint, or collapsed pipe observed during the inspection process.

6. Customer sewer service shall be maintained throughout the duration of the project whenever possible. If maintaining customer sewer service is not possible, limit outage duration for sewer customers to a maximum of 8 hours. Each home or business being affected shall be contacted and informed of the work being conducted, when service will be unavailable, and the duration of the outage. Contact shall be made a minimum of 7 calendar days prior to service outage. Deliver a written notice to affected home or business a minimum of one business day prior to beginning work informing them when service will be unavailable, the duration of the outage, and a local telephone number for customers to call and discuss any issues.

7. Install CIPP in accordance with ASTM F1216, Section 7, or ASTM F1743, Section 6 with the following modifications:
   a. Quantity of resin used for tube impregnation is sufficient to fill the volume of air voids in the tube with additional allowances for polymerization shrinkage and the loss of resin through cracks and irregularities in the original pipe wall.
   b. Thorough resin saturation is achieved throughout the length of the felt tube.
   c. Point of vacuum is not further than 25 feet from the point of initial resin introduction.
   d. Vacuum point is no further than 75 feet from the leading edge of the resin after a vacuum in the tube is established.
   e. Leading edge of the resin slug is as near to perpendicular as possible.

8. Tube insertion: Position the wetout tube in the pipeline using either inversion or a pull-in method. If pulled into place, utilize power winching equipment suitable for intended purpose and ensure the tube is not damaged as a result of pull-in friction. The tube shall be pulled-in or inverted through an existing manhole or approved access point and shall extend fully to the next designated manhole or termination point.

9. Temperature Monitoring: Place temperature gauges inside the tube at the invert level of each end and monitor the temperature during the CIPP cure cycle.

10. Reopen service connections without excavation.

11. Following installation and reinstatement of service connections, perform post-installation inspection utilizing CCTV requirements for pre-installation.

12. Perform visual inspection of the CIPP pipeliner in accordance with ASTM F1743, Section 8.6.
13. Prepare CIPP pipeliner samples and test physical properties in accordance with ASTM F1216 or ASTM F1743, Section 8, using either method proposed. Flexural properties shall meet or exceed the values listed in Table 1 of the applicable ASTM. Provide for testing of flexural properties and reporting of test data for each line segment by an independent testing laboratory accredited by AASHTO Accreditation Program.

14. Obtain wall thickness samples for analysis from each line segment installed and at the end farthest from the cure source. Determine wall thickness of samples as described in paragraph 8.1.6 of ASTM F1743. The minimum wall thickness at any point shall not be less than 87.5% of the design thickness as specified in Subsection 660.2.01. Provide for testing of wall thickness samples and reporting of test data for each line segment by an independent testing laboratory accredited by AASHTO Accreditation Program.

M. Relocating, Adjusting, and Removing

1. Sewer Valves and Air Release Valves
   a. Relocate, adjust to grade, or remove valves and valve boxes according to the Plans or as designated by the GDOT Project Manager and Utility Owner.
   b. Protect items during removal and relocation. Contractor shall replace lost or damaged Items at no expense to GDOT.
   c. Disconnect each joint before removing items from the trench.
   d. Test for leakage, adjust, and retest until no leaks appear.
   e. Backfill as specified in Subsection 660.3.05.
   f. Consider valve boxes part of the valve assembly and remove them intact with the valve.

2. Existing Valve Boxes
   a. Lower, raise, or relocate existing valve boxes to the location and grade established on the Plans or by the GDOT Project Manager and Utility Owner according to Section 611.

3. Lift Stations
   a. Demolish and install new lift station (if required) as indicated on the Plans.

4. Manholes
   a. Frames and covers shall be removed and manhole shall be adjusted to grade. Adjustment shall be made by adding or removing brickwork, concrete, riser rings, or other materials in accordance with the Plans and The Facility Owner’s.
   b. Within roadways, manholes shall be brought to final grade prior to paving. A minimum area of 12 inches (300 mm) wide (from edge of manhole ring) and a minimum of 12 inches deep shall be excavated around the adjusted frame and cover prior to final paving. The excavated area shall be brought to the grade of the roadway base material with a minimum of 3,000 psi concrete in preparation of final paving.

5. Utility related items identified on the Plans to be salvaged are the property of the Utility Owner. Contractor shall coordinate with Utility Owner on delivery of salvaged materials. Should the Utility Owner choose to not accept these materials they shall be removed from the project site as soon as practical.

N. Aerial Crossings

1. When the aerial crossing is accomplished by attachment to a bridge or drainage structure, the crossing shall meet all requirements of the agencies that own or have jurisdiction over such structures.

2. Support must be provided for all joints in pipes utilized for aerial crossings. The supports must be installed to prevent frost heave, overturning, and settlement. Precautions against freezing, such as insulation and increased slope, must be provided.

3. Expansion joints shall be provided between above ground and below ground sewers. Where buried sewers change to aerial sewers, construction shall minimize frost heaving.

4. Aerial installations shall avoid or minimize stream blockage during normal high water events.
5. For pressure pipe, underground valves shall be provided at both ends of the aerial crossing so that the section can be isolated for testing or repair. The valves shall be restrained, easily accessible, and not subject to flooding. An air release/vacuumrelief valve shall be installed at all high points along the aerial crossing.

6. Appropriate guards shall be installed at both ends of the aerial crossing to prevent public access to the pipe.

660.3.06 Quality Acceptance

A. Materials Certification

For certain products, assemblies and materials, in lieu of normal sampling and testing procedures by the Contractor, the GDOT, and Utility Owner may accept from the Contractor the manufacturer’s certification with respect to the product involved under the conditions set forth in the following paragraphs:

1. Material certifications shall be provided to GDOT, who shall distribute to the Utility Owner. Material certifications shall be approved by GDOT and the Utility Owner prior to construction. The certification shall state/specify that the named product conforms to these specifications and requirements of the Utility Owner and GDOT, and representatives samples thereof have been sampled and tested as specified.

2. The certification shall either:
   a. Be accompanied by a certified copy of the test results, or on GDOT QPL list, or
   b. Certify such test results are on file with the manufacturer and will be furnished to the GDOT Project Manager and Utility Owner upon demand.

3. The certification shall state/specify the name and address of the manufacturer and the testing agency and the date of tests; and sets forth the means of identification which shall permit field determination of the product delivered to the project as being the product covered by the certification.

4. Submit certification with two copies of the covered product to the GDOT Project Manager, and Utility Owner.

5. GDOT or the Utility Owner will not be responsible for any costs of certification or for any costs of the sampling and testing of products in connection therewith.

6. GDOT and the Utility Owner reserve the right to require samples and test products for compliance with pertinent requirements irrespective of prior certification of the products by the manufacturer. Any materials that fail to meet specification requirements will be rejected.

7. In accordance with the BUY AMERICA requirements of the Federal regulations (23 U.S.C. 313 and 23 CFR 635.410) all manufacturing processes for steel and iron products or predominantly of steel or iron (at least 90% steel or iron content) furnished for permanent incorporation into the work on this project shall occur in the United States. The only exception to this requirement is the production of pig iron and the processing, pelletizing and reduction of iron ore, which may occur in another country. Other than these exceptions, all melting, rolling, extruding, machining, bending, grinding, drilling, coating, etc. must occur in the United States.
   a. Products of steel include, but are not limited to, such products as structural steel piles, reinforcing steel, structural plate, steel culverts, guardrail steel supports for signs, signals and luminaires. Products of iron include, but are not limited to, such products as cast iron frames and grates and ductile iron pipe. Coatings include, but are not limited to, the applications of epoxy, galvanizing and paint. The coating material is not limited to this clause, only the application process.
   b. Records to be provided by the Contractor for this certification shall include a signed mill test report and a signed certification by each supplier, distributor, fabricator, and manufacturer that has handled the steel or iron product affirming that every process, including the application of a coating, performed on the steel or iron product has been carried out in the United States of America, except as allowed by this Section. The lack of these certifications will be justification for rejection of the steel and/or iron product or nonpayment of the work.
   c. The requirements of said law and regulations do not prevent the use of miscellaneous steel or iron components, subcomponents and hardware necessary to encase, assemble and construct the above products, manufactured products that are not predominantly steel or iron or a minimal use of foreign steel and iron materials if the cost
of such materials used does not exceed one-tenth of one percent (0.1%) of the total contract price or $2,500.00, whichever is greater.
B. Hydrostatic Testing of Pressure Pipe

1. When the Utility Owner and GDOT Project Manager approve a section of pressure pipe for testing, the Contractor shall furnish the materials, equipment, and labor to conduct the pressure and leakage tests. Use a test pump, pressure gauge, and a means of measuring the water necessary to maintain the required pressure during the prescribed testing time. All pressure and leakage testing shall be done in the presence of the Utility Owner and GDOT Project Manager as a condition precedent to the approval and acceptance of the system. All pipes shall have been thoroughly flushed prior to testing. Simultaneous or separate pressure and leakage tests may be performed.

2. All water for testing and flushing shall be water provided by the Contractor, at no cost to the Utility Owner or GDOT, from an approved source. Flow velocity during line filling shall not exceed 2 feet (0.6 m) per second (fps).

3. Testing Requirements
   a. Force main testing shall be done immediately after installation and backfilling has been completed.
   b. Force mains shall be tested in accordance with the latest revision of AWWA C600 for ductile iron and C605 for PVC under an average hydrostatic pressure of the greater of 1.5 times the maximum working pressure or 150 psi as measured at the lowest point in the system for a minimum of 2 hours. Pressure shall be maintained until all sections under testing have been checked for evidence of leakage.
   c. While the system is being filled with water, air shall be carefully and completely exhausted. If permanent air vents are not located at all high points, the Contractor shall install corporation stops or fittings and valves at such points at no additional expense to the Utility so the air can be expelled as the pipe system is slowly filled.
   d. Makeup water shall be added, as required, to maintain the pressure within 5 psi of the test pressure. The quantity used shall be measured by pumping from a calibrated container. The maximum amount of makeup water allowed shall be determined by the following formula:

   \[ L = \frac{S \times D \times P^{0.5}}{148,000} \]

   in which,

   \( L \) = Allowable Leakage in gallons per hour
   \( S \) = Length of pipe being tested in feet
   \( D \) = Nominal pipe diameter in inches
   \( P \) = Average test pressure during the test in psi gauge

   e. Visible leaks shall be corrected regardless of total leakage shown by test. All pipe fittings and other materials found to be defective under test shall be removed and replaced. Lines which fail to meet test requirements shall be repaired and retested as necessary until test requirements are met. No additional compensation shall be made for repairs or retesting.

C. Alignment Testing

1. Straight alignment of gravity sewers shall be checked by either using a laser beam or lamping. Each segment between manholes shall show at least 90% of the full pipe circle visible when looking from manhole to manhole.

D. CCTV Inspection

1. All new gravity sewers shall be inspected via closed-circuit televising (CCTV) in accordance with The Facility Owner’s Standard Specifications. The Contractor shall thoroughly clean the entire sewer system by jetting or applicable methods prior to the TV inspection. If conditions indicate repairs are necessary, re-televising may be required. The initial inspection shall be scheduled with the Utility Owner and GDOT Project Manager when the Contractor advises that all sewer lines are ready for testing.
2. All TV inspections shall be performed by persons and/or firms qualified in such work.
3. The Contractor shall provide the TV inspection deliverables according to the format indicated in The Facility Owner’s Standard Specifications.

E. Manhole Vacuum Testing
1. A vacuum test shall be performed on each manhole to assure water-tightness in accordance with ASTM C1244. The manholes shall be tested separately from sewer lines.
2. If the manhole fails the initial test, necessary repairs shall be made at the Contractor’s expense and the manhole retested until a satisfactory test is obtained.

F. Deflection Testing
Utility Owner may require deflection tests utilizing a mandrel to be performed on flexible gravity sewer pipes. Deflection tests shall be conducted after the final backfill has been in place to permit stabilization of the soil-pipe system and follow the requirements of The Facility Owner’s Standard Specifications. No mechanical pulling devices shall be used. All pipes not passing this mandrel shall be re-laid or replaced by the Contractor at no additional cost to GDOT or Utility Owner.

G. Leakage Testing
1. The Contractor shall conduct tests to determine the water-tightness of gravity sewers when completed. The Utility Owner shall observe the tests with the Contractor furnishing all required labor, equipment, and materials.
2. Sewers shall be tested in sections with each section extending between two adjacent manholes or from the end of the sewer to the nearest manhole. The Contractor shall utilize an infiltration test, an exfiltration test, or a low pressure air test at the direction of the Utility Owner and in accordance with The Facility Owner’s Standard Specifications.
   a. Infiltration: Each section shall be covered with no less than two feet (0.6 m) of water above the top of the pipe at the highest point. The infiltration will be measured by means of a weir located in the downstream manhole. The pressure head of 2 feet (0.6 m) shall be maintained for a period of not less than 24 hours before the weir measurements are made.
   b. Exfiltration: The sewer at the upstream side of the lower manhole and the upstream side of upper manhole in each section shall be closed with a watertight bulkhead and the sewer filled with water until the water elevation in the upstream manhole is not less than two feet (0.6 m) above the top of the sewer pipe or two feet (0.6 m) above ground water elevation in the trench, whichever is higher. The exfiltration will be determined by measuring the amount of water required to maintain the above stated water elevation for a period of one hour from the start of the test. The entire length of section to be tested shall be filled and maintained full of water for a period of approximately 24 hours prior to the start of the test.
   c. The amount of exfiltration or infiltration shall not exceed 50 gallons per inch of pipe diameter per 24 hours per mile of sewer in each and every section tested in accordance with the above.
   d. In the event the allowable leakage rates are not met, the Contractor shall determine the location(s) where excess water is entering or leaving the sewer. The sewer and/or the manholes shall be repaired and retested until the leakage in the sewer is within the allowable limits.
3. Air test: Low pressure air testing shall be completed to detect leaks in sewers where hydrostatic testing is not practical. The Contractor shall perform the low pressure air test as specified in ASTM C924 for concrete and Uni-Bell UNI-B-6-98 for plastic pipe.

660.3.07 Contractor Warranty and Maintenance
General Provisions 101 through 150.
660.4 Measurement

Incidentals including excavation, rock removal, backfilling, flushing, testing, temporary water connections, pavement removal, pavement replacement, and other incidentals required for the installation of sanitary sewer items are not measured for separate payment and shall be included in the applicable Pay Items below. Gravity sewer mains, manholes, force mains, and laterals, and associated items of work in this Specification, complete, in place, and accepted, are measured for payment as follows:

A. Ductile Iron Sewer Main
   Ductile iron sewer mains shall be measured in linear feet (meters) for each size and thickness class installed. Measurement shall be horizontally above the centerline of the pipe and shall include the length of valves and fittings.

B. PVC Sewer Force Main
   PVC sewer mains shall be measured in linear feet (meters) for each size and thickness installed. Measurement shall be horizontally above the centerline of the pipe and shall include the length of valves and fittings.

C. PVC Sewer Gravity Main
   PVC sewer mains shall be measured in linear feet (meters) for each size and thickness installed. Measurement shall be horizontally above the centerline of the pipe and shall include the length of valves and fittings.

D. Fusible PVC Sewer Main
   Fusible PVC sewer mains shall be measured in linear feet (meters) for each size and type installed. Measurement shall be horizontally above the centerline of the pipe and shall include the length of valves and fittings.

E. HDPE Sewer Main
   HDPE sewer mains shall be measured in linear feet (meters) for each size and type installed. Measurement shall be horizontally above the centerline of the pipe and shall include the length of valves and fittings.

F. Concrete Sewer Main
   Concrete sewer mains shall be measured in linear feet (meters) for each size and type installed. Measurement shall be horizontally above the centerline of the pipe and shall include the length of valves and fittings.

G. Ductile Iron Fittings
   Ductile iron fittings shall be included in the overall pipe measurements acceptably installed. This Item includes, but is not limited to, wyes, tees, bends, crosses, sleeves, plugs and caps, and reducers.

H. Restrained Joints
   Joint restraints used with the installation of PVC or ductile iron pipe shall be included in the overall pipe measurements acceptably installed on the number of each size restraint device installed.

I. Manholes
   Manholes shall be measured on an individual basis on the depth and type of manhole acceptably installed in accordance to Section 668.

J. Drop Manholes
   Drop Manholes shall be measured on an individual basis on the depth and type of manhole acceptably installed in accordance to Section 668.

K. Connection to Existing Manholes
   Connections to existing manholes shall be included in the Contract price for sewer line connection acceptably installed.

L. Gate Valves
   Gate valves shall be measured on an individual basis for each size valve and box assembly acceptably installed.
L. **Check Valves**
   Check valves shall be measured on an individual basis on the number of each size valve and box assembly acceptably installed.

M. **Plug Valves**
   Plug valves shall be measured on an individual basis on the number of each size valve and box assembly acceptably installed.

N. **Tapping Sleeve and Valve Assembly**
   Tapping sleeve and valve assemblies shall be measured on an individual basis on the number of each size tapping sleeve and valve assembly acceptably installed.

O. **Sewer Laterals**
   Sewer laterals shall be measured on an individual basis on the size of lateral acceptably installed.

P. **Cleanouts**
   Sewer laterals shall be measured on an individual basis on the number of each cleanout acceptably installed.

Q. **Air Release Valve Assemblies**
   Air release valve assemblies shall be measured on an individual basis on the number of each size and type of air release valve assembly acceptably installed.

R. **Steel Casing**
   Steel casing pipe of the wall thickness and diameter specified shall be measured by the linear foot for each size and thickness of steel casing pipe installed. Measurement shall be horizontally above the centerline of the casing.

S. **Relocation of Existing Air Release Valves**
   Relocation of existing air release valves shall be measured on an individual basis on the number of each acceptably relocated.

T. **Adjustment of Existing Valve Boxes to Grade**
   Adjustment of existing valve boxes adjusted to grade in their original locations shall be measured on an individual basis on the number of each valve box acceptably adjusted in accordance with section 611.

U. **Removal of Air Release Valves**
   Removal of existing air release valves shall be measured on an individual basis on the number of each removed.

V. **Removal of Manholes**
   Removal of existing manholes shall be measured on an individual basis on the number of each manhole removed in accordance to Section 610.

W. **Adjustment of Manholes**
   Adjustment of existing manholes adjusted to grade in their original locations shall be measured on an individual basis on the number of each manhole acceptably adjusted in accordance to Section 611.

X. **Reconstruct Manhole**
   Reconstruction of existing manholes to grade in their original locations shall be measured on an individual basis on the number of each acceptably reconstructed manhole in accordance to Section 611.

Y. **Adjustment of Cleanout**
   Adjustment of cleanouts to grade shall be measured on an individual basis on the number of each cleanout acceptably adjusted in accordance to Section 611.
Z. Concrete Thrust Blocks
   Concrete thrust blocking installed shall be measured as indicated in Section 500 per cubic yard of concrete acceptably installed. When Concrete Thrust Blocks is not shown as a pay item, include the cost of the work in the bid price for the sewer pipe.

AA. Concrete Thrust Collars
   Thrust collars shall be measured on an individual basis on the number of each size thrust collar acceptably installed. When Concrete Thrust Collars is not shown as a pay item, include the cost of the work in the bid price for the sewer pipe.

BB. Cut and Plug Sewer Main
   Cutting and plugging of sewer mains shall be measured on an individual basis per each instance of cutting and plugging existing mains as shown on the Plans.

CC. Removal of Sewer Mains
   Removal of sewer mains shall be measured per linear foot for each size pipe actually removed in accordance to Section 610. Measurement shall be horizontally above the centerline of the pipe removed and shall include the length of valves and fittings.

DD. Line Stop
   Line stops shall be measured on an individual basis on the number of each size line stop actually installed.

EE. Flowable Fill
   Flowable fill shall be measured as indicted in Section 600 per cubic yard of flowable fill acceptably installed. When flowable fill is not shown as a pay item, include the cost of the work in the bid price for the appropriate item.

FF. Cured-In-Place-Pipe (CIPP) Liners
   CIPP liners shall be measured per linear foot for each size CIPP installed. Measurement shall be horizontally above the centerline of the host pipe from center of manhole to center of manhole.

GG. Insertion Valve
   Insertion valves shall be measured on an individual basis on the number of each size valve acceptably installed.

HH. Closed Circuit Television (CCTV) Inspection
   CCTV inspection shall be measured per linear foot of CCTV inspection price to be included in the Contract price for sewer pipe acceptably performed.

II. Three-Dimensional (3D) Survey
   Three-dimensional survey shall be measured as one lump sum for a complete and accepted survey price to be included in the Contract price for sewer pipe acceptably performed.

660.4.01 Limits
   General Provisions 101 through 150.

660.5 Payment
   The Contract Unit Price for each Item, complete and accepted, shall include all costs incidental to the construction of the item according to the Plans and as specified in this Section. The unit prices bid shall include due allowance for the salvage value of all materials removed from existing or temporary lines and not installed in the completed work. All such surplus items shall become the property of the Contractor unless such surplus items are specified to be salvaged. Payment for any item listed below is full compensation for the Item or Items complete in place.
A. Ductile Iron Sewer Mains

Ductile iron sewer mains shall be paid for at the unit price per linear foot for each diameter pipe installed and shall cover the cost for all materials, transportation, labor, equipment, excavation, sheeting and shoring, installation of pipe, joints and jointing materials, anchoring, warning tape, polyethylene encasement, protection of existing utilities, connections to existing mains, flushing, backfilling, backfill materials, disposal of unsuitable backfill material, clean backfill, tamping, testing, densities, utility crossings, dewatering, trench stabilization, clean-up, restoration, and all work and materials necessary to place the pipe into service.

B. PVC Force Main

PVC sewer mains shall be paid for at the unit price per linear foot for each diameter and thickness pipe installed and shall cover the cost for all materials, transportation, labor, equipment, excavation, sheeting and shoring, installation of pipe, joints and jointing materials, anchoring, tracer wire, warning tape, protection of existing utilities, connections to existing mains, flushing, backfilling, backfill materials, disposal of unsuitable backfill material, clean backfill, tamping, testing, densities, utility crossings, dewatering, trench stabilization, clean-up, restoration, and all work and materials necessary to place the pipe into service.

C. PVC Gravity Main

PVC sewer mains shall be paid for at the unit price per linear foot for each diameter and thickness pipe installed and shall cover the cost for all materials, transportation, labor, equipment, excavation, sheeting and shoring, installation of pipe, joints and jointing materials, tracer wire, warning tape, protection of existing utilities, connections to existing mains, flushing, backfilling, backfill materials, disposal of unsuitable backfill material, clean backfill, tamping, testing, densities, utility crossings, dewatering, trench stabilization, clean-up, restoration, and all work and materials necessary to place the pipe into service.

D. Fusible PVC Sewer Main

Fusible PVC sewer mains shall be paid for at the unit price per linear foot for each diameter pipe installed and shall cover the cost for all materials, transportation, labor, equipment, excavation, sheeting and shoring, entry/exit pits, installation of pipe, joints and jointing materials, tracer wire, warning tape, mechanical joint adapters, protection of existing utilities, connections to existing sewer mains, fusion process materials and equipment, directional drilling materials and equipment, tracking system, assembling, welding, supporting, stringing, pulling, pigging, cleaning, flushing, backfilling, backfill materials, disposal of unsuitable backfill material, clean backfill, tamping, testing, densities, utility crossings, dewatering, trench stabilization, clean-up, and restoration, and all incidentals necessary to place the pipe into service except where such items are shown to be paid for under a separate Pay Item.

E. HDPE Sewer Main

HDPE sewer mains shall be paid for at the unit price per linear foot for each diameter pipe installed and shall cover the cost for all materials, transportation, labor, equipment, excavation, sheeting and shoring, entry/exit pits, installation of pipe, tracer wire, warning tape, mechanical joint adapters, protection of existing utilities, connections to existing mains, fusion process materials and equipment, directional drilling materials and equipment, tracking system, assembling, welding, supporting, stringing, pulling, pigging, cleaning, flushing, backfilling, disposal of unsuitable backfill material, clean backfill, tamping, testing, densities, utility crossings, dewatering, trench stabilization, clean-up, and restoration, and all incidentals necessary to place the pipe into service except where such items are shown to be paid for under a separate Pay Item.

F. Concrete Sewer Main

Concrete sewer mains shall be paid for at the unit price per linear foot for each diameter pipe installed and shall cover the cost for all materials, transportation, labor, equipment, excavation, sheeting and shoring, installation of pipe, anchoring, tracer wire, warning tape, protection of existing utilities, connections to existing mains, flushing, backfilling, backfill materials, disposal of unsuitable backfill material, clean backfill, tamping, testing, densities, utility crossings, dewatering, trench stabilization, clean-up, restoration, and all work and materials necessary to place the pipe into service.

G. Ductile Iron Fittings
Ductile iron fittings will not be paid for separately but shall be included in the overall pipe measurements acceptably installed each fitting as denoted in the manufacturers’ catalogues and shall cover the cost for all materials, transportation, labor, equipment, excavation, sheeting and shoring, installation of fittings, joints and jointing materials, anchoring, warning tape, polyethylene encasement, protection of existing utilities, flushing, backfilling, backfill materials, disposal of unsuitable backfill material, clean fill, tamping, testing, densities, utility crossings, dewatering, trench stabilization, clean-up, restoration, all other related and necessary materials, work, and equipment required to install a complete and operable pipeline fitting. This Item includes, but is not limited to, wyes, tees, bends, crosses, sleeves, plugs and caps, couplings, and reducers.

H. Restrained Joints
Restrained joints not be paid for separately but shall be included in the overall pipe measurements acceptably installed each fitting as denoted and shall cover the cost for all materials, transportation, labor, equipment, excavation, sheeting, shoring, installation of the restraint device, polyethylene encasement, protection of existing utilities, backfilling, backfill material, disposal of unsuitable backfill materials, clean fill, tamping, testing, densities, utility crossings, dewatering, trench stabilization, clean-up, restoration, and all work and materials necessary to install the restrained joint.

I. Gate Valves
Gate valves shall be paid for at the unit price per each size gate valve and box assembly installed and shall cover the cost for all materials, transportation, labor, equipment, excavation, sheeting and shoring, installation of the gate valves including valve box, concrete pad or collar, valve identification disc, valve marker, valve tag, polyethylene encasement, protection of existing utilities, backfilling, backfill material, disposal of unsuitable backfill materials, clean fill, tamping, testing, densities, utility crossings, dewatering, trench stabilization, clean-up, restoration, and all work and materials necessary to install the gate valve and place it in service.

J. Plug Valves
Plug valves shall be paid for at the unit price per each size plug valve and box assembly installed and shall cover the cost for all materials, transportation, labor, equipment, excavation, sheeting and shoring, installation of the butterfly valves (including valve box), concrete pad or collar, valve identification disc, valve marker, valve tag, polyethylene encasement, protection of existing utilities, backfilling, backfill material, disposal of unsuitable backfill materials, clean fill, tamping, testing, densities, utility crossings, dewatering, trench stabilization, clean-up, restoration, and all work and materials necessary to install the plug valve and place it in service.

K. Check Valves
Check valves shall be paid for at the unit price per each size check valve and box assembly installed and shall cover the cost for all materials, transportation, labor, equipment, excavation, sheeting and shoring, installation of the check valves, concrete vault or manhole, concrete pad or collar, valve identification disc, valve marker, valve tag, polyethylene encasement, protection of existing utilities, backfill material, disposal of unsuitable backfill materials, clean fill, tamping, testing, densities, utility crossings, dewatering, trench stabilization, clean-up, restoration and all work and materials necessary to install the check valve and place it in service.

L. Tapping Sleeve and Valve Assembly
Tapping sleeve and valve assemblies shall be paid for at the unit price per each size tapping sleeve and valve assembly installed and shall cover the cost for all materials, transportation, labor, equipment, excavation, sheeting and shoring, installation of tapping sleeves and valve assemblies including valve box, concrete pad or collar, valve marker, polyethylene encasement, protection of existing utilities, tapping the force main, backfilling, backfill material, disposal of unsuitable backfill materials, clean fill, tamping, testing, densities utility crossings, dewatering, trench stabilization, clean-up, restoration, and all work and necessary hardware to install the tapping sleeve and valve assembly and place it in service.

M. Manholes
Sanitary sewer manholes shall be paid for at the unit price in accordance to Section 668, according to the depth and type of each manhole installed and shall cover the cost for all materials, transportation, labor, equipment, excavation, sheeting
and shoring, installation of manholes including ring and covers, inverts, coatings, protection of existing utilities, backfill material, disposal of unsuitable backfill materials, clean fill, tamping, testing, densities, utility crossings, dewatering, trench stabilization, clean-up, restoration, and all work and materials necessary to install the manhole and place into service.

N. **Drop Manholes**

Sanitary sewer drop manholes shall be paid for at the unit price per each manhole installed in accordance to Section 668 and shall cover the cost for all materials, transportation, labor, equipment, excavation, sheeting and shoring, installation of manholes including ring and covers, inverts, coatings, outside drop piping and fittings, concrete encasement, protection of existing utilities, backfill material, disposal of unsuitable backfill materials, clean fill, tamping, testing, densities, utility crossings, dewatering, trench stabilization, clean-up, restoration, and all work and materials necessary to install the manhole and place into service.

O. **Connections to Existing Manholes**

Connections to existing manholes shall be paid for in the Contract Price for sewer pipe and shall cover the cost for all materials, transportation, labor, equipment, excavation, sheeting and shoring, installation of manhole connection, rework of inverts, grout, coatings, protection of existing utilities, backfill material, disposal of unsuitable backfill materials, clean fill, tamping, testing, densities, utility crossings, dewatering, trench stabilization, clean-up, bypass pumping (as required), restoration, and all work and materials necessary to acceptably install the manhole connection.

P. **Sewer Laterals**

Sewer laterals shall be paid for at the unit price per size of each size installed to the property line and shall cover the cost for all materials, transportation, labor, equipment, excavation, sheeting and shoring, piping, installation of sewer lateral including connection to existing pipe, cleanout, cleanout marker, fittings including wyes, bends, pipe, cap with screw plug, tracer wire, casting, concrete collar or pad, valve box and cover, bypass pumping (as required), protection of existing utilities, backfilling, backfill materials, disposal of unsuitable backfill material, clean fill, tamping, testing, densities, utility crossings, dewatering, trench stabilization, clean-up, restoration, and all work and materials necessary to place the sewer lateral into service.

Q. **Cleanouts**

Sewer cleanouts shall be paid for at the unit price per each cleanout installed and shall cover the cost for all materials, transportation, labor, equipment, excavation, sheeting and shoring, piping, installation of cleanout including connection to existing pipe, fittings including wyes, bends, pipe, cap with screw plug, tracer wire, casting, concrete collar or pad, valve box and cover, bypass pumping (as required), protection of existing utilities, backfilling, backfill materials, disposal of unsuitable backfill material, clean fill, tamping, testing, densities, utility crossings, dewatering, trench stabilization, clean-up, restoration, and all work and materials necessary to place the cleanout into service.

R. **Air Release Valve Assembly**

Air release valves shall be paid for at the unit price per each size and type of air release valve installed and shall cover the cost for all materials, transportation, labor, equipment, excavation, sheeting and shoring, installation of the air release assembly, tapping saddle, isolation valve, reducers, piping, restraints, fittings, tracer wire, concrete manhole or vault, protection of existing utilities, backfilling, backfill materials, disposal of unsuitable backfill material, clean fill, tamping, testing, densities, utility crossings, dewatering, trench stabilization, clean-up, restoration, and all work and materials necessary to place the air release assembly into service.

S. **Steel Casing**

Steel casing pipe shall be paid for at the unit price per linear foot according to the diameter and thickness of the steel casing installed and shall cover the cost for all materials, transportation, labor, equipment, excavation, sheeting and shoring, protection of existing utilities, steel casing pipe, skid, steel straps, coatings, casing spacers, end seals, boring and jacking pits, backfilling, backfill materials, disposal of unsuitable backfill material, clean fill, tamping, testing, densities, dewatering, trench stabilization, clean-up, restoration, and all work and materials necessary to install the steel casing except where such items are shown to be paid for under a separate Item. The carrier pipe shall be paid for as a separate
Pay Item.

T. Relocation of Existing Air Release Valves

Relocation of air release valves shall be paid for at the unit price per each air release valve assembly relocated and shall cover the cost for all materials, transportation, labor, equipment, excavation, sheet and shoring, removal of existing air release valve assembly, installation at location indicated in Plans, piping, restraints, tracer wire, fittings, adjustment to final grade, polyethylene encasement, protection of existing utilities, backfilling, backfill material, disposal of unsuitable backfill materials, clean fill, tamping, testing, densities, dewatering, trench stabilization, clean-up, restoration, and all work necessary to locate, remove, and relocate the air release valve except where such items are shown to be paid for under a separate Pay Item.

U. Adjustment of Existing Valve Boxes to Grade

Adjustment of existing valve boxes shall be paid for which shall be paid for in accordance with Section 611, at the unit price per each valve box adjusted to final grade and shall cover the cost of all materials, transportation, labor, equipment, excavation, sheeting and shoring, valve case and lid, trench adapter and operating nut extensions/reductions, tracer wire and splices, tracer wire riser and threaded plug, concrete pad, valve identification disc, backfilling, backfill material, disposal of unsuitable backfill materials, clean fill, tamping, testing, densities, dewatering, trench stabilization, clean-up, restoration, and all work and materials necessary to adjust the valve box.

V. Adjustment of Existing Manhole

Manhole tops to be raised or lowered 2 feet (0.6 m) or less are considered adjustment of existing manholes, which shall be paid for in accordance with Section 611, at the unit price per each manhole adjusted to final grade and shall cover the cost of all materials, including new ring and covers for sanitary manholes, transportation, labor, equipment, plugs, riser sections, brick and mortar, adjustment rings, excavation, sheeting and shoring, backfilling, backfill material, disposal of unsuitable backfill materials, clean fill, tamping, testing, densities, dewatering, trench stabilization, clean-up, bypass pumping (as required), restoration, and all work and materials necessary to install the new ring and cover and adjust to final grade.

W. Reconstruct Existing Manhole

Manhole tops to be raised between 2 feet (0.6 m) and 6 feet (1.5 m), or tops to be lowered more than 2 feet (0.6 m) are considered the reconstruction of an existing manhole, which shall be paid for which shall be paid for in accordance with Section 611, at the unit price per each manhole adjusted to final grade and shall cover the cost of all materials, including new ring and covers for sanitary manholes, transportation, labor, equipment, plugs, riser sections, brick and mortar, excavation, sheeting and shoring, backfilling, backfill material, disposal of unsuitable backfill materials, clean fill, tamping, testing, densities, dewatering, trench stabilization, clean-up, bypass pumping (as required), restoration, and all work and materials necessary to reconstruct the manhole. Tapping a new pipeline into an existing manhole is not considered reconstruction.

X. Adjustment of Cleanout

Adjustment of cleanouts shall be paid for at the unit price per each cleanout adjusted to finished grade and shall cover the cost of all materials, including transportation, labor, equipment, excavation, sheeting and shoring, backfilling, backfill material, disposal of unsuitable backfill materials, clean fill, tamping, testing, densities, dewatering, trench stabilization, clean-up, bypass pumping (as required), restoration, and all work and materials necessary to adjust the cleanout to final grade.

Y. Removal of Manhole

Removal of manholes shall be paid for which shall be paid for in accordance with Section 610, at the unit price per each manhole removed and shall cover the cost for all materials, transportation, labor, equipment, excavation, sheet and shoring, protection of existing utilities, backfilling, backfill material, disposal of unsuitable backfill materials, clean fill, tamping, testing, densities, dewatering, trench stabilization, clean-up, bypass pumping (as required), restoration, and all work necessary to remove and dispose of manholes including ring and covers.

Z. Removal of Air Release Valve
Removal of air release valves shall be paid for which shall be paid for in accordance with Section 610, at the unit price per each air release valve removed and shall cover the cost for all materials, transportation, labor, equipment, excavation, sheeting and shoring, removal of air release valve assemblies, piping, manholes, concrete vaults and fabricated enclosures, backfilling, backfill materials, disposal of unsuitable backfill materials, clean fill, tamping, testing, densities, dewatering, trench stabilization, clean-up, restoration, storage and delivery of air release valves identified to be salvaged, and all work necessary to remove the air release valve.

AA. Concrete Thrust Blocks

Concrete thrust blocks shall be paid for at the unit price per cubic yard of concrete complete in place as indicated in Section 500 and shall cover the cost of all materials, transportation, labor, equipment, excavation, sheeting and shoring, concrete, forming, reinforcement, protection of existing utilities, backfilling, backfill material, disposal of unsuitable backfill materials, clean fill, tamping, testing, densities, dewatering, trench stabilization, clean-up, restoration, and all work and materials necessary to install a complete thrust block. Concrete Thrust Blocks is not shown as a pay item; include the cost of the work in the bid price for the sewer pipe.

BB. Concrete Thrust Collars

Concrete thrust collars shall be paid for at the unit price per each size of thrust collar and shall cover the cost of all materials, transportation, labor, equipment, excavation, sheeting and shoring, reinforced concrete thrust collars, retainer glands, reinforcement, protection of existing utilities, backfilling, backfill material, disposal of unsuitable backfill materials, clean fill, tamping, testing, densities, dewatering, trench stabilization, clean-up, restoration, and all work and materials necessary to install a complete thrust collar. Concrete Thrust Collars is not shown as a pay item; include the cost of the work in the bid price for the sewer pipe.

CC. Removal of Sewer Mains

Removal of sewer mains shall be paid for which shall be paid for in accordance with Section 610, at the unit price per linear feet (meters) of the size of sewer main to be removed and shall cover the cost for all materials, transportation, labor, equipment, excavation, sheeting and shoring, protection of existing utilities, backfilling, backfill material, disposal of unsuitable backfill materials, clean fill, tamping, testing, densities, dewatering, trench stabilization, clean-up, bypass pumping (as required), restoration, and all work and materials necessary to locate, remove and dispose of the pipe and associated appurtenances. Unless indicated for removal as a separate Pay Item, appurtenances to be removed shall include but not be limited to fittings, isolation valves, air release valves, valve boxes, steel casings, casing spacers, service laterals, thrust blocks, and concrete. All such surplus items shall become the property of the Contractor unless specified to be salvaged by the Utility Owner.

DD. Cut and Plug Existing Sewer Main

Cutting and plugging of existing sewer mains shall be paid for at the unit price per each installation and shall cover all materials, transportation, labor, equipment, excavation, sheeting and shoring, protection of existing utilities, backfilling, backfill material, disposal of unsuitable backfill materials, clean fill, tamping, testing, densities, dewatering, trench stabilization, clean-up, restoration, and all work and materials necessary to cut and plug existing sewer mains except where such items are shown to be paid for under a separate Pay Item.

EE. Line Stops

Line stops shall be paid for at the unit price per each size line stop installed and shall cover the cost for all materials, transportation, labor, equipment, excavation, sheeting and shoring, installation of the line stop assemblies, valves, valve boxes, fittings, restraints, protection of existing utilities, backfilling, backfill material, disposal of unsuitable backfill materials, tamping, testing, densities, utility crossings, dewatering, trench stabilization, clean-up, restoration, and all work and materials necessary to install the gate valve and place it in service.

FF. Flowable Fill

Flowable fill shall be paid for at the unit price per cubic yard of flowable fill installed as indicated in Section 600 and shall cover the cost for all materials, transportation, labor, equipment, excavation, sheeting and shoring, flushing,
plugging air release valves and service connections, installation of flowable fill, protection of existing utilities, backfilling, backfill material, disposal of unsuitable backfill materials, clean fill, tamping, testing, densities, dewatering, trench stabilization, clean-up, restoration, and all work and materials necessary to complete the installation. When flowable fill is not shown as a pay item for the sewer items, include the cost of the work in the bid price for the appropriate item.

GG. Cured-In-Place-Pipe (CIPP) Liner

CIPP liners shall be paid for at the unit price per linear foot and diameter of liner acceptably installed and shall cover the cost for all materials, transportation, labor, equipment, bypass pumping, cleaning, root removal, flushing, coordination with and protection of existing utilities, distributing project notices, removal of protruding service connections, supplying and installing liner, reinstatement of service connections, inspection, testing, clean-up, restoration, and all work and materials necessary to complete the liner installation including incendentals and associated labor for which payment is not provided under a separate Pay Item. Point repairs shall be paid for under the unit price per linear foot of the diameter and material of pipe being replaced.

HH. Insertion Valve

Insertion valves shall be paid for at the unit price per each size valve inserted and shall cover the cost for all materials, transportation, labor, equipment, excavation, sheeting and shoring, installation of the valve, valve boxes, fittings, restraints, concrete pad or collar, valve identification disc, valve marker, polyethylene encasement, protection of existing utilities, backfilling, backfill material, disposal of unsuitable backfill materials, clean fill, tamping, testing, densities, dewatering, trench stabilization, clean-up, restoration, and all work and materials necessary to install the insertion valve and place it in service.

II. Closed Circuit Television (CCTV) Inspection

CCTV inspection shall be included in the Contract price for sewer pipe inspection acceptably performed and shall cover the costs for all materials, transportation, labor, equipment, excavation, sheeting, shoring, bypass pumping, protection of existing utilities, CCTV inspection, CDs / DVDs, inspection reports, clean-up, restoration, and all work and materials necessary to perform the CCTV inspection.

JJ. Three-Dimensional (3D) Survey

Three-dimensional survey shall be price to be included in the Contract price for sewer pipe, and shall cover the costs for all non-destructive methods of locating installed utilities and associated electronic deliverables per Utility Owner specifications.

Payment will be made under:

<table>
<thead>
<tr>
<th>Item No. 660</th>
<th>Sewer Force Main, _____ in (mm)</th>
<th>Per linear foot (meter)</th>
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<td>Item No. 660</td>
<td>Sewer Gravity Main, _____ in (mm)</td>
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<tr>
<td>Item No. 660</td>
<td>Sewer Main, Ductile Iron, _____ in (mm)</td>
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<td>Item No. 660</td>
<td>Sewer Main, Fusible PVC, _____ in (mm)</td>
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<td>Item No. 660</td>
<td>Cured-in-Place Pipe (CIPP) Liner, _____ in (mm)</td>
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<td>Item No. 660</td>
<td>Sewer Main, _____ in (mm)</td>
<td>Per linear foot (meter)</td>
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<tr>
<td>Item No. 660</td>
<td>Steel Casing, _____ in (mm)</td>
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<td>Item No. 660</td>
<td>Cleanouts, _____ in (mm)</td>
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<td>Removal of Air Release Valve, in (mm)</td>
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<td>Cut and Plug Sewer Main, in (mm)</td>
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<td>Concrete Thrust Collar, in (mm)</td>
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<td>Gate Valve, in (mm)</td>
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<td>Check Valve, in (mm)</td>
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<td>Plug Valve, in (mm)</td>
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<td>Insertion Valve, in (mm)</td>
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<td>Sewer Lateral, in (mm)</td>
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<tr>
<td>Line Stop, in (mm)</td>
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**660.5.01 Adjustments**

General Provisions 101 through 150.
DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

SPECIAL PROVISION
PROJECT:
COUNTY: Richmond GA and
Aiken SC
PI NO: 210327-

Add the following: Section 663 - Electric Transmission Systems

663.1 General Description

This Work consists of furnishing material, labor, tools, equipment, and other items necessary for the installation, relocation, and adjustment of overhead and underground electric transmission systems in accordance with the Project plans, Job Specification Book, and Specifications. Correct all deficiencies in the Work indicated by testing, inspecting, and as directed by the Engineer.

663.1.01 Definitions

General Provisions 101 through 150

Whenever the terms “Company” or “Georgia Power Company” are used in this Special Provision and its related documents, they mean Georgia Power Company, Inc., its subsidiaries, successors and/or assigns. Whenever the term “Plan” is used in this Special Provision and related documents, this includes the Electric Transmission Relocation Plans. The term “Southern Company” is synonymous with Georgia Power Company.

The term “Transmission Engineer” means the Company’s authorized individual having the authority to give instructions pertaining to the Work. The Transmission Engineer has authority to approve or reject the Work and otherwise represent the Company. The “Transmission Engineer” is not authorized to revoke, alter, enlarge, relax, or release any requirements of the Contract, Plans, and Specifications nor will they act as an agent for the Contractor. Ensure Transmission Engineer has access to all of the Work for inspection and testing. Ensure Transmission Engineer attends Closing Conference and Final Inspection.

During emergency situations involving the Company’s facilities, such as weather related incidents or power outages, or for system maintenance, the Transmission Engineer has the authority to direct the Work and to add Company crews as necessary. Additional items required for any emergency work, power outages, or system maintenance will be addressed as specified in Section 104.03 Alteration of Plans or Character of Work.

663.1.02 Related References

General Provisions 101 through 150
Section 663 - Electric Transmission Systems

A. Standard Specifications

Section 201-Clearing and Grubbing
Section 205-Roadway Excavation
Section 207-Excavation and Backfill for Minor Structures
Section 208-Enbankments
Section 209-Subgrade Construction
Section 310-Graded Aggregate Construction
Section 400-Hot Mix Asphaltic Concrete Construction
Section 441-Miscellaneous Concrete
Section 500-Concrete Structures
Section 852-Miscellaneous Steel Materials
Section 861-Piling and Round Timber
Section 863-Preservative Treatment of Timber Products

B. Related Documents

1. Core Function, Line Design Segment of the Southern Company Transmission Playbook (online)
   Available from the Institute of Electrical and Electronics Engineers
   http://www.ieee.org/portal/site/iptools/

For access to and copies of the Related Documents, please contact:

Georgia Power Company
Mr. Mark Tilden
Bin 10140
241 Ralph McGill Boulevard, NE
Atlanta, Georgia 30308-3374
404-506-4203

If there is a conflict or discrepancy between the Specifications and the Core Function, Line Design Segment of the Southern Company Transmission Playbook or the National Electric Safety Code, perform the Work in accordance with the Core Function, Line Design Segment of the Southern Company Transmission Playbook and National Electric Safety Code, current editions. If the Southern Company Standards and National Electric Safety Codes are revised after notice to contractors date, perform the Work specified in the Plans, Job Specification Book, and Specifications using the revised standards and codes. If revisions to the Southern Company Standards and National Electric Safety Codes are dated on or after the letting date shown on the bid proposal, notify the Engineer in writing of such revisions.

663.1.03 Submittals

General Provisions 101 through 150

Office of Utilities
Section 663 - Electric Transmission Systems

Refer to the Core Function, Line Design Segment of the Southern Company Transmission Playbook, current published edition, for electric utility submittal requirements.

A. Completion Letter and As-Built Documentation

Provide no later than 30 days after the completion of the work a Completion Letter and As-Built Documentation to both the Engineer and the Contract Coordinator consisting of the following information.

1. Include in the Completion Letter the date all electrical transmission pay items are completed and ready to be turned over to the Company. Also, include a detailed estimate of quantities in place and explanation of any deviations or overruns.
2. Provide As-Built Documentation of the in-place and accepted electrical transmission facilities. Documentation shall consist of two sets of full size plans and electronic files in the form of a Bentley MicroStation file using the same version and format in which the Electrical Transmission Plans were created.

663.2 Materials

A. Overhead and Underground Electric Transmission System

Any new materials required for the construction of proposed electric facilities shown on the Plans and listed in the Job Specification Book are to be purchased by the Contractor from Georgia Power Company. When required by the Plans and Job Specification Book, transfer all existing materials to the required locations as specified. Replace in-kind any material damaged during transfer.

Any other materials needed to complete the electric transmission system installation shall be transferred from the existing locations specified in the Plans. Incidental materials required to complete the Work will be supplied by the Contractor.

Ensure all materials used are in conformance with the requirements and standards set forth in the Core Function, Line Design Segment of the Southern Company Transmission Playbook. Items required for the Work but not shown in the Plans or the Job Specification Book will require the review and approval by the Engineer and Transmission Engineer prior to incorporating such material into the Work. If there are revisions to the Work, the Company will provide a revised material list. The additional items required for the Work will be addressed as specified in Section 104.03 Alteration of Plans or Character of Work.

Because Georgia Power Company is supplying materials necessary for the Work, do not request a Materials Allowance as provided for in Section 109.07 Partial Payments.

663.2.01 Delivery, Storage, and Handling

General Provisions 101 through 150

Coordinate with the Georgia Power Company representative listed below to ensure all necessary materials are available for installation as required on the Plans, including the roadway staging plans. Follow any delivery, storage and handling procedures set forth in the Core Function, Line Design Segment of the Southern Company Transmission Playbook.

Coordinate with Georgia Power Company to take delivery of required material, load required material, and transport all required material to the project. All of the material may be received by Georgia Power Company at once or receipt can be made on an as needed basis. If material storage is required, properly store the material at pre-approved locations within the project limits or at pre-approved locations off the project limits. Return or dispose of all unused and remaining material as detailed in subsection 663.3.05.H.
Section 663 - Electric Transmission Systems

The Contractor is responsible for all materials from the time of delivery from Georgia Power Company to the return of remaining materials to Georgia Power Company or disposal. When all Work is complete, the Transmission Engineer, in the presence of the Engineer and Contractor, will field verify and document the Work’s in-place material. From the Transmission Engineer’s field work, verify with the Engineer and Transmission Engineer material quantities used are in-line with what was taken from the Company and what was returned to the Company.

Georgia Power Company
Mr. Mark Tilden
Bin 10140
241 Ralph McGill Boulevard, NE
Atlanta, Georgia 30308-3374
404-506-4203

663.3 Construction Requirements

663.3.01 Personnel

General Provisions 101 through 150

Ensure the construction and installation of all electric transmission facilities is performed by a subcontractor who is prequalified with Georgia Power Company and is registered with the Department. Contact the Georgia Power Company representative listed below to obtain a list of prequalified electric contractors. Electric contractors not prequalified with Georgia Power Company will not be registered and approved as a subcontractor for the Department. Ensure the transmission contractor selected for the bidding process is prequalified with Georgia Power Company.

Georgia Power Company
Mr. Mark Tilden
Bin 10140
241 Ralph McGill Boulevard, NE
Atlanta, Georgia 30308-3374
404-506-4203

663.3.02 Equipment

General Provisions 101 through 150

Ensure all equipment used is in conformance with the requirements and standards set forth in the Core Function, Line Design Segment of the Southern Company Transmission Playbook, current edition. Obtain prior approval from the Engineer before starting Work on specialty items such as boring equipment and others of similar complexity.

663.3.03 Preparation

General Provisions 101 through 150

Follow all preparation procedures set forth in the Core Function, Line Design Segment of the Southern Company Transmission Playbook. Perform necessary preliminary engineering, field engineering, survey, and construction staking and layout for the installation of the specified electric transmission system.

663.3.04 Fabrication

Office of Utilities
Section 663 - Electric Transmission Systems

General Provisions 101 through 150

Ensure fabrication procedures and requirements conform to those set forth in Core Function, Line Design Segment of the Southern Company Transmission Playbook. Submit shop drawings to the Engineer and Transmission Engineer for any items requiring fabrication. Obtain approval from the Engineer and Transmission Engineer prior to ordering materials.

For projects with joint use poles, coordinate with the Transmission Engineer, Engineer, pole owner, and attaching utility owners. Prior to fabrication, obtain approval of shop drawings from the Transmission Engineer, Engineer, pole owner, and attaching utility owners. If poles are supplied by the pole owner, provide the necessary design information including attachment heights and loads to the pole owner. Coordinate with all parties to ensure the poles meet the requirements of the Plans and Specifications, can accommodate the attaching owner’s requirements, and comply with the pole owner’s standards.

663.05 Construction

Review the Plans and Job Specification Book to ensure all items required for the Work are included in the price bid for each electric transmission bid item. Provide a detailed list of materials required to complete the Work to the Engineer and Transmission Engineer prior to ordering and taking delivery from Georgia Power Company. In the required detailed list of materials, identify any material required to complete the Work not shown in the Plans or in the Job Specification Book. The contractor will need to confirm that all easements have been acquired and dependent activities have been completed before any work can commence in the affected areas.

A. Permission to Enter Private Property

Comply with Section 107—Legal Regulations and Responsibility to the Public.

Through an agreement between the Department and the Company; the Contractor is given the permission to enter upon private properties found outside the project’s construction limits. This permission is granted for the sole purpose of activities relating to the installation and/or adjustments of transmission facilities only and is limited to the area of existing easements obtained by the company. Such permission to enter upon private properties is temporary and such rights commence upon project award and automatically expire upon completion and project final acceptance by the Department.

In all cases where it is necessary to enter upon private property; it is the Contractors sole responsibility to minimize any disruptions to personal property in the commencement of such work thereof. Additionally, the following restrictions and requirements apply:

1. All Work is limited to the installation, relocation, or replacement of transmission facilities, including the Work necessary to restore each private property as required in number 6 of this subsection.
2. Notify the Engineer and the private property owner, and resident 72 hours before commencing Work on said private property.
3. Only vehicles and equipment required for the Work are allowed on any private property.
4. Do not store any materials, vehicles, or equipment on any private property longer than the duration required to perform the Work.
5. Do not use any private property as an on-site detour or vehicle path.
6. Immediately following any construction located on private property, restore all areas of the same parcel to a condition substantially the same as existed immediately prior to any such disturbances, including without limitation, any and all necessary repairs, and replacement of grassing, landscaping and pavement which may be removed and
Section 663 - Electric Transmission Systems

excavated by the Contractor. Ensure all necessary repairs are made to restore the original contours and re-establish the ground cover to control erosion.

B. Finding Existing Underground Utilities and Obstructions

Comply with Subsection 107.13 and Subsection 107.21. When unforeseen conflicts or site conditions require Plan changes, perform the Work as altered according to Subsection 104.03 and Subsection 104.04.

Follow all customer notification requirements and obtain approval from the Transmission Engineer prior to disrupting existing services required for the installation of the transmission facilities shown on the Plans and Job Specification Book and for the installation of any required temporary transmission facilities.

C. Installation of Electric Transmission Systems

Follow all relevant procedures set forth in the Core Function, Line Design Segment of the Southern Company Transmission Playbook. Construct all temporary and proposed electric transmission facilities in accordance with the requirements set forth in the Plans, Job Specification Book, and as instructed by the Transmission Engineer.

D. Excavating Trenches

Excavate trenches to the proper grade, depth, and width as follows:

1. Trench to Grade
   
   Ensure excavated trench bottoms are firm, free from boulders, and conform to the established grade.
   
   a. Backfill, according to Section 207, any part of the trench excavated below the established grade. Use Class I or Class II Soils (Section 810), and firmly compact the soil.
   
   b. Where the established grade of a trench is in rock, undercut the bottom of the trench by at least 6 in (150 mm), then backfill and compact according to Section 207.
   
   Conduct blasting operations according to Subsection 107.12.
   
   c. Excavate trenches under pavement to grade as follows:
      
      i. To remove the pavement, cut it at least 12 in (300 mm) wider than each trench edge to provide solid bearing for the pavement edges when replaced. Remove the pavement according to Section 444, except no separate payment will be made for sawed joints.
      
      ii. Directional bore under existing sidewalks, curbs, gutters, and pavements according to Section 615.

2. Minimum Trench Depth

   Excavate trenches to provide at least 48 in (1.2 m) cover depth from the Work to the finished pavement surface, sidewalk, grass plot, etc. unless indicated otherwise on the Plans or by the Engineer.

   If any part of a transmission facility is to be placed in or under a new embankment, finish the embankment to at least a 2 ft (600 mm) plane above the top of the proposed facility before excavating the trench.

3. Trench Width

   Excavate trenches wide enough to allow proper installation of the Work.

E. Directional Boring

This Work consists of installing various sizes of bores by directional boring through whatever materials may be encountered.

Furnish, for the Engineer’s approval, a plan showing the proposed methods for the installation of the horizontal directional bore. The Engineer will review the proposed installation plan within 10 working days of receipt by the Department. No
directional boring Work will be allowed until the Contractor's submitted plan is approved by the Engineer. Include the following detail in the plan, as a minimum:

1. List of projects completed by the company performing the boring operation, environment of installation (urban work, river crossing, freeway), diameter of product installation and length of bores. Include the name, address and phone number of an owner’s representative with knowledge of the performance of the Work. Provide at least five previously completed projects of similar scope as the boring Work included in this contract.

2. List of the Contractor’s key personnel with a resume of boring experience. The Department will be the sole judge of the qualifications of the foreman and the drill operators.

3. Location of all proposed boring entry and exit pits.

4. Proposed alignment of bore both horizontal and vertical. For the proposed alignment, maintain a minimum clearance of 18 inches (450 mm) or 2 times the diameter of the final product installation, whichever is greater, at any obstruction. Do not perform boring in select backfill areas such as at mechanically stabilized wall locations.

5. Proposed diameter of bore. This diameter is the diameter of the final product installation.

6. Proposed diameter of pilot borehole.

7. Proposed diameter of back reamer. Do not allow the diameter of the back reamer to exceed 1.5 times the diameter of the final product installation.

8. Proposed depth of cover. Ensure the depth of cover will be equal to or greater than 10 times the diameter of the final product installation. Under paved shoulders, maintain a minimum depth of cover of 4 feet (1.22 meters). Under travel lanes or outside of paved shoulders, maintain a minimum depth of cover of 8 feet (2.44 meters).

9. Evaluation of soil conditions to be encountered. A complete soil survey is not required. As a minimum, excavate the entrance and exit pits for the proposed bore and determine the nature of the material likely to be encountered. Base the drilling fluid composition on the evaluation of the materials encountered in the bore pit excavation.


11. Proposed drilling fluid pressure and flow rates.


13. Proposed pull back rate.

14. Type of tracking system.

Excavate suitable pits or trenches for the boring operation and for placing end joints or termination connectors of conduit when required. Securely sheet and brace pits or trenches where necessary to prevent caving. Where directional boring is required under railroads, highways, streets or other facilities, perform construction in a manner that will not interfere with the operation of the facility, and not weaken the roadbed or structure. Do not disturb or excavate any roadway pavement, subgrade, roadbed, paved shoulder, or unpaved median as part of the boring or pipe placing operation for any reason without written authorization by the Engineer.

In the above areas, unless otherwise authorized in writing by the Engineer, abandon in place any broken or damaged boring rod/stem, boring head (including transmitter/transponder locating heads and cutter heads), couplings (including back reaming, swivel or connector couplings), or any other material that cannot be retrieved as part of the pullback operation. Abandoned material will become the property of the Department. No additional payment for abandoned material will be made.
Section 663 - Electric Transmission Systems

Continuously monitor the location and alignment of the pilot drill progress to insure compliance with the proposed installation alignment and to verify depth of the bore. Accomplish monitoring by manual plotting based on location and depth readings provided by the locating/ tracking system or by computer generated bore logs which map the bore path based on information provided by the locating/tracking system. Obtain readings or plots on every drill rod and provide to the Engineer on a daily basis for as-built plans.

Monitor drilling fluids such as the pumping rate, pressures, viscosity and density during the pilot bore, back reaming, and/or pipe installation stages to ensure adequate removal of soil cuttings and to ensure the stability of the borehole is maintained. Do not allow drilling fluid pressures to exceed that which can be supported by the overburden (soil) pressure to prevent heaving or a hydraulic fracture of the soils. Contain excessive drilling fluids at the entry and exit points until recycled or removed from the site. Dispose of all drilling fluids in a manner acceptable to the appropriate local, state and federal regulations. The Work will be immediately suspended whenever drilling fluids seep to the surface other than in the boring entrance or exit pit. Propose a method to prevent further seepage and remove and dispose of any drilling fluid on the surface prior to resuming the boring operation.

To minimize heaving during pullback, determine the pullback rate to maximize the removal of soil cuttings and minimize compaction of the ground surrounding the borehole. Ensure the pullback rate minimizes overcutting of the borehole during the back reaming operation to ensure excessive voids are not created resulting in post installation settlement. Restore any surfaces damaged by the Work to their preconstruction conditions. All costs associated with the restoration are to be borne by the Contractor.

The distance the excavation extends beyond the end of the bore will depend upon the character of the excavated material. Do not exceed 2 feet (0.61 meters) in any case. If the character of the material being excavated makes it desirable, decrease the distance on instructions from the Engineer. Once the directional boring has commenced, insofar as practical, continue the operation without interruption. After the boring has been completed, immediately backfill the pits or trenches excavated to facilitate boring operations.

Proceed with the Work from a surface staging area provided for the boring equipment and workers. Obtain approval from the Engineer on the proposed location of the staging area. Bore the holes mechanically. Place excavated material near the top of the working pit and dispose of as required. Water or other fluids in connection with the boring operation will be permitted only to the extent necessary to lubricate cutting. Do not perform jetting. Excavation will not be measured for payment.

In unconsolidated soil formations, a gel-forming colloidal drilling fluid consisting of at least 10% high grade carefully processed bentonite may be used to consolidate excavated material, seal the walls of the hole, and furnish lubrication for subsequent removal of material and immediate back reaming/installation of conduit. Continuously monitor and maintain the flow pressure on the drilling fluid at the minimal pressure required to place the fluid. In normal circumstances, do not exceed a flow pressure of 200 psi (1379 kPa). At any time during boring operations, do not exceed a flow pressure of 500 psi (3448 kPa). Remove all drilling fluid spoils from both ends of the bore and properly dispose of material at a properly permitted location.

The maximum allowable variation fromline and grade is a maximum of 2 percent. Pressure grout any voids, with an approved mix, that develop during the installation operation and are determined by the Engineer to be detrimental to the Work.

Directional boring operations inherently include the risk of encountering below grade obstructions that begin to alter the bore direction. Should an obstruction be encountered, notify the Engineer immediately. Boring deeper or shallower (if minimum pipe depth can be maintained), moving the boring head to the right or left of the obstruction, or attempt to bore through the obstruction (if other than solid rock) are acceptable corrective measures to restore bore alignment. To restore the bore alignment, perform a minimum of three attempts at each encountered obstruction with different corrective measures. The Engineer may authorize a relocation of the bore if a suitable bore alignment cannot be restored.

F. Removals

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Follow all relevant procedures set forth in the Core Function, Line Design Segment of the Southern Company Transmission Playbook. Remove all temporary and existing electric transmission facilities in accordance with the requirements set forth in the Plans, Job Specification Book, and as instructed by the Transmission Engineer. Cutting of poles specified for removal or abandonment will not be permitted. Remove pole(s) and backfill void in accordance with Section 207. Backfill any voids remaining from the removal of underground facilities in accordance with Section 207. Replace, in-kind (material and depth), any voids remaining in roadway structures.

G. Transfers

Follow all relevant procedures set forth in the Core Function, Line Design Segment of the Southern Company Transmission Playbook. Transfer all electric transmission facilities in accordance with the requirements set forth in the Plans, Job Specification Book, and as instructed by the Transmission Engineer.

H. Remaining Material

1. Material Originating from Georgia Power Company

   Return all unused material to Georgia Power Company. The Transmission Engineer will verify and accept or reject all returned material. No credit will be given the Contractor for any material rejected by Georgia Power Company due to, but not limited to, damage, material loss, or material theft.

2. Material Originating from the Project Site – Existing or Surplus Material

   Properly dispose of all surplus material. With exception to transformers, surplus and properly dispose of any material originating from the project and is not required, or no longer required, for the completion of the Work. Return all transformers to Georgia Power Company.

I. Staging, Mobilization, and De-mobilization

Perform the Work in accordance with the staging plans. If there are changes to the staging plans, obtain concurrence from the Engineer and Transmission Engineer. There will be no separate measurement and payment for mobilization or de-mobilization required by the staging plans or required by the staging plans proposed by the Contractor.

663.3.06 Quality Acceptance

A. Testing

Follow all relevant procedures set forth in the Core Function, Line Design Segment of the Southern Company Transmission Playbook, current edition. Ensure Transmission Engineer is present at all inspection and testing.

B. Semi-Final Utility Inspection

When the contractor has finished the Electrical Transmission System Work, the Contractor may, by written notice, request that a semi-final utility inspection be made. The Engineer, along with the Transmission Engineer, will determine if the Electrical Transmission System Work is ready for semi-final utility inspection. The Engineer, in agreement with the Transmission Engineer, will have the final decision on whether the Electrical Transmission System Work is complete and thereby ready for semi-final utility inspection. If all the Electrical Transmission System Work provided for and contemplated by the Contract is found to be complete to the Engineer’s satisfaction and all documents required in connection with the Electrical Transmission System Work has been submitted and accepted then, the Contractor may request transfer of the completed Electrical Transmission System Work to the Owner.
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Once the new facilities are in service and accepted by the Owner, provide written correspondence notifying the Engineer and Owner that utility location services will be the responsibility of said Owner.

Such partial acceptance shall in no way relieve the Contractor of the responsibility for satisfactory completion of the Contract, or for failure of any portion of the Electrical Transmission System Work prior to Final Acceptance of the Project.

663.3.07 Contractor Warranty and Maintenance

General Provisions 101 through 150

663.4 Measurement

Overhead and underground electric transmission systems, and other items of Work in this Specification, in place, operational, and accepted, are measured for payment as follows:

A. Overhead Electric Transmission

Overhead Electric Transmission is measured in linear feet for each size (kV) facility installed. The facility is measured along the centerline of the facility from pole structure to pole structure through all fittings, switches, and transformers and shall include the installation of the pole structures and any materials required by the Core Function, Line Design Segment of the Southern Company Transmission Playbook, current edition. Measurement includes all wire to complete the work regardless of the number of phase conductors specified. Measurement will begin and end at existing pole structures where the newly installed Work ties back to the existing facility or specified ending structure. There will be no compensation for replacement of damaged or lost materials. There will be no separate measurement and payment for the transfer of existing materials to new location. Include the costs of transferring materials in the costs for the installation of Overhead and Underground Electric Transmission System, temporary or permanent. If shown on the Plans, installation of transmission secondary/service lines will be measured from the newly installed pole structure to the existing residential or commercial pole structure or first attachment.

Obtain measurements with electronic survey equipment and provide Engineer with printout of installed facilities indicating State Plane Coordinates and station numbers of each pole structure and indicate distances between pole structures starting from the beginning of the Work (existing facility pole structure).

B. Overhead Electric Transmission (Temporary)

Temporary Overhead Electric Transmission is measured in linear feet for each size (kV) facility installed. The facility is measured along the centerline of the facility from pole structure to pole structure through all fittings, switches, and transformers and shall include the installation of the pole structures and any materials required by the Core Function, Line Design Segment of the Southern Company Transmission Playbook, current edition. Measurement includes all wire to complete the work regardless of the number of phase conductors specified. Measurement will begin and end at existing pole structures where the newly installed Work connects to the existing facility or specified ending structure. There will be no compensation for replacement of damaged or lost materials. There will be no separate measurement and payment for the transfer of existing materials to new location. Include the costs of transferring materials in the costs for the installation of Overhead and Underground Electric Transmission System, temporary or permanent.

Obtain measurements with electronic survey equipment and provide Engineer with printout of installed facilities indicating State Plane Coordinates and station numbers of each pole structure and indicate distances between pole structures starting from the beginning of the Work (existing facility pole structure).

C. Underground Electric Transmission

Underground Electric Transmission is measured in linear feet for each size (kV) facility installed. The facility is measured along the center following the existing ground line from structure to structure through junction boxes, transformers, and
Section 663 - Electric Transmission Systems

vaults and shall include the installation of the pole structures and any materials required by the Core Function, Line Design Segment of the Southern Company Transmission Playbook, current edition. Measurement includes all wire to complete the work regardless of the number of phase conductors specified. Measurement will begin and end at existing pole structures, vault structures, splice point, or termination cabinet where the newly installed Work connects to the existing facility. All measurements will begin and terminate at the intersection of the structure and grade. Measurement for buried facilities that transition up pole structures to tie to the overhead facilities will not be made. There will be no compensation for replacement of damaged or lost materials. There will be no separate measurement and payment for the transfer of existing materials to new location. Include the costs of transferring materials in the costs for the installation of Overhead and Underground Electric Transmission System, temporary or permanent. Measurement of unsuccessful boring attempts will not be made. Successful directional bores will not be measured for payment.

Obtain measurements with electronic survey equipment and provide Engineer with printout of installed facilities indicating State Plane Coordinates and station numbers of each underground structure and pole structure and indicate distances between structures starting from the beginning of the Work (existing facility structure).

D. Installation of Poles

Installation of Steel, Concrete, and Wood Poles will not be measured separately for payment. Steel, Concrete, and Wood Poles are included in the measurement of the overhead or underground electric transmission, permanent or temporary.

E. Installation of Electric Wire

Installation of Electric Wire will not be measured separately for payment. Wire is included in the measurement of the overhead or underground electric transmission, permanent or temporary.

F. Removal of Overhead Electric Transmission

Removal of the Overhead Electric Transmission is measured in linear feet for each size (kV) facility removed. The facility is measured along the centerline of the facility from pole structure to pole structure through the equipment mounted on the poles including, but not limited to, wire, transformers, switches, capacitor banks, street lights, and reclosers. Measurement will begin and end at existing pole structures where the transmission facility specified for removal connects to the existing facility to remain. There will be no compensation for replacement of damaged or lost materials. There will be no separate measurement and payment for the transfer of existing materials to new location. Include the costs of transferring materials in the costs for the installation of Overhead and Underground Electric Transmission System, temporary or permanent. There will be no separate measurement and payment for backfilling of voids remaining from removal or replacement of roadway section. Measurement includes the removal of all wire regardless of the number of phase conductors specified. If shown on the Plans, removal of transmission secondary/service lines will be measured from the existing transmission pole specified to be removed to the existing residential or commercial pole structure or first attachment.

Obtain measurements with electronic survey equipment and provide Engineer with printout of existing facilities indicating State Plane Coordinates and station numbers of each pole structure and indicate distances between pole structures starting from the beginning of the Work (existing facility pole structure). Obtain approval from the Engineer of existing measurements prior to beginning removal Work.

G. Removal of Overhead Electric Transmission (Temporary)

Removal of the Overhead Electric Transmission (Temporary) is measured in linear feet for each size (kV) facility removed. The facility is measured along the centerline of the facility from pole structure to pole structure through the equipment mounted on the poles including, but not limited to, wire, transformers, switches, capacitor banks, street lights, and reclosers. Measurement will begin and end at existing pole structures where the transmission facility specified for removal connects to the existing facility to remain. There will be no compensation for replacement of damaged or lost materials. There will be no separate measurement and payment for the transfer of existing materials to new location. Include the costs of transferring materials in the costs for the installation of Overhead and Underground Electric Transmission System, temporary or permanent. There will be no separate measurement and payment for backfilling of voids remaining from removal or
Section 663 - Electric Transmission Systems

replacement of roadway section. Measurement includes the removal of all wire regardless of the number of phase conductors specified.

Obtain measurements with electronic survey equipment and provide Engineer with printout of existing facilities indicating State Plane Coordinates and station numbers of each pole structure and indicate distances between pole structures starting from the beginning of the Work (existing facility pole structure). Obtain approval from the Engineer of existing measurements prior to beginning removal Work.

H. Removal of Underground Electric Transmission

Removal of Underground Electric Transmission is measured in linear feet for each size (kV) facility removed. The lines are measured along the center following the existing ground line from structure to structure through junction boxes, transformers, and vaults and shall include the removal, if required by the plans, of any materials that are integral to the temporary facility. This includes, but is not limited to, junction boxes, transformers, switching cubicle, and vaults. Measurement will begin and end at existing pole structures or vault structures where the newly installed facility connects to the existing facility. There will be no compensation for replacement of damaged or lost materials. There will be no separate measurement and payment for the transfer of existing materials to new location. Include the costs of transferring materials in the costs for the installation of Overhead and Underground Electric Transmission System, temporary or permanent. There will be no separate measurement and payment for backfilling of voids remaining from removal or replacement of roadway section. Measurement includes the removal of all wire regardless of the number of phase conductors specified.

Obtain measurements with electronic survey equipment and provide Engineer with printout of existing facilities indicating State Plane Coordinates and station numbers of each underground structure and pole structure and indicate distances between structures starting from the beginning of the Work (existing facility structure). There will be no measurement and payment for backfilling of voids left by removed underground equipment. Obtain approval from the Engineer of existing measurements prior to beginning removal Work.

I. Removal of Poles

Removal of Steel, Concrete, and Wood Poles will not be measured separately for payment. Removal is included in the measurement of the removal of overhead or underground electric transmission, permanent or temporary.

663.4.01 Limits

General Provisions 101 through 150

663.5 Payment

The Contract Unit Price for each Item shall include all costs incidental to the construction of the Item according to the Plans, Job Specification Book, and as specified in this Section. All such surplus items will become the property of Georgia Power Company unless otherwise specified. Payment for any Item listed below is full compensation for the Item or Items in place, operational, and accepted.

A. Overhead Electric Transmission

Overhead Electric Transmission will be paid for at the contract unit price per linear foot for each size (kV) facility installed. Payment is full compensation for materials, handling, delivery, and storage of material and installation of material in accordance with the Plans and Job Specification Book. Payment is full compensation for necessary handling and delivery of surplus material to Georgia Power Company. Payment is full compensation for all the necessary material, equipment and labor to install the Overhead Electric Transmission, including all items necessary and items specified in the Job Specification Book and Plans. Payment is full compensation for the entire linear feet required to span the portion of the project specified and to tie back to existing facilities. This includes items such as wire (regardless of the number of phase conductors
Section 663 - Electric Transmission Systems

specified), transformers, poles (wood, steel, or concrete), framing assemblies, utility assemblies, conductors, hardware, guy assemblies, street lights, switches, capacitor banks, reclosers and any other item(s) necessary to provide for an in place and accepted operational Overhead Electric Transmission of the size specified in the Plans and Job Specification Book. If shown on the Plans, installation of transmission service lines will be paid for as specified in this Section.

B. Overhead Electric Transmission (Temporary)

Temporary Overhead Electric Transmission will be paid for at the contract unit price per linear foot for each size (kV) facility installed. Payment is full compensation for material, handling, delivery, and storage of materials and installation of materials in accordance with the Plans and Job Specification Book. Payment is full compensation for any work required to accommodate project staging, detours, or structures not shown on the Plans or Job Specification Book. Payment is full compensation for necessary handling and delivery of surplus material to Georgia Power Company. Payment is full compensation for all the necessary material, equipment and labor to install the Temporary Electric Transmission, including all items necessary and items specified in the Job Specification Book and Plans. Payment is full compensation for the entire linear feet required to span the portion of the project specified and to tie back to existing facilities. This includes items such as wire (regardless of the number of phase conductors specified), transformers, poles (wood, steel, or concrete), framing assemblies, utility assemblies, conductors, hardware, guy assemblies, street lights, switches, capacitor banks, reclosers and any other item(s) necessary to provide for an in place and accepted operational Overhead Electric Transmission of the size specified in the Plans and Job Specification Book.

C. Underground Electric Transmission

Underground Electric Transmission will be paid for at the contract unit price per linear foot for each size (kV) facility installed. Payment is full compensation for material, handling, delivery, and storage of material and installation of material in accordance with the Plans and Job Specification Book. Payment is full compensation for necessary handling and delivery of surplus material to Georgia Power Company. Payment is full compensation for all the necessary material, equipment and labor to install the Underground Electric Transmission, including all items necessary and items specified in the Job Specification Book and Plans. Payment is full compensation for the entire linear feet required to traverse, below grade, the portion of the project specified and to tie back to existing facilities. This includes items such as directional boring, wire (regardless of the number of phase conductors specified), conduit, transformers, vaults, switching cubicle, hardware, and any other item(s) necessary to provide for an in place and accepted operational Underground Electric Transmission of the size specified in the Plans and Job Specification Book. Payment of unsuccessful boring attempts will not be made. Successful directional bores will not be paid for separately.

D. Installation of Poles

No separate payment will be made for the installation of Steel, Concrete, or Wood Poles. Costs for the installation of poles are included in the price for overhead or underground electric transmission, permanent or temporary.

E. Installation of Electric Wire

No separate payment will be made for the installation of electric wire. Costs for the installation of electric wire are included in the price for overhead or underground electric transmission, temporary or permanent.

F. Removal of Overhead Electric Transmission

Removal of Overhead Electric Transmission will be paid for at the contract unit price per linear foot for each size (kV) facility removed. Payment is full compensation for removal, handling, delivery, storage, and surplus of materials. Payment is full compensation for necessary handling and delivery of surplus material to Georgia Power Company. Payment is full compensation for all the necessary equipment and labor to remove the Overhead Electric Transmission. Payment is full compensation for the entire linear feet removed back to existing or new facilities as shown on the plans. This includes items such as wire (regardless of the number of phase conductors specified), transformers, poles (wood, steel, or concrete), framing assemblies, utility assemblies, conductors, hardware, guy assemblies, street lights, and any other item(s) necessary for complete removal. If shown on the Plans, removal of transmission service lines will be paid for as specified in this Section.
Section 663 - Electric Transmission Systems

All material removed and not re-used becomes the property of Georgia Power Company. Payment for Removal of Overhead Electric Transmission includes the removal, handling, delivery, and off-loading of all material at a Georgia Power Company Operating Headquarters specified by the Transmission Engineer.

G. Removal of Overhead Electric Transmission (Temporary)

Removal of Overhead Electric Transmission (Temporary) will be paid for at the contract unit price per linear foot for each size (kV) facility removed. Payment is full compensation for removal, handling, delivery, storage, and surplus of materials. Payment is full compensation for all the necessary equipment and labor to remove the Temporary Electric Transmission. Payment is full compensation for the entire linear feet removed back to existing or new facilities as shown on the Plans. This includes items such as wire (regardless of the number of phase conductors specified), transformers, poles (wood, steel, or concrete), framing assemblies, utility assemblies, conductors, hardware, guy assemblies, street lights, and any other item(s) necessary for complete removal.

All material removed and not re-used becomes the property of Georgia Power Company. Payment for Removal of Overhead Electric Transmission (Temporary) includes the removal, handling, delivery, and off-loading of all material at a Georgia Power Operating Headquarters specified by the Transmission Engineer.

H. Removal of Underground Electric Transmission

Removal of Underground Electric Transmission will be paid for at the contract unit price per linear foot for each size (kV) facility removed. Payment is full compensation for removal, handling, delivery, storage, and surplus of materials. Payment is full compensation for all the necessary equipment and labor to remove the Underground Electric Transmission. Payment is full compensation for the entire linear feet removed back to existing or new facilities as shown on the Plans. This includes removal of items such as wire (regardless of the number of phase conductors specified), conduit, transformers, vaults, hardware, and any other item(s) necessary for complete removal.

All material removed and not re-used becomes the property of Georgia Power Company. Payment for Removal of Overhead Electric Transmission includes the removal, handling, delivery, and off-loading of all material at a Georgia Power Operating Headquarters specified by the Transmission Engineer.

I. Removal of Poles

No separate payment will be made for the removal of Steel, Concrete, or Wood Poles. Costs for the removal of poles are included in the price for removal of overhead or underground electric transmission, permanent or temporary.

Payment will be made under:

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<th>Description</th>
<th>Per linear foot (meter)</th>
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<td>Overhead Electric Transmission - _______ kV</td>
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<td>663</td>
<td>Overhead Electric Transmission (Secondary/Service) - _______ kV</td>
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<td>Overhead Electric Transmission (Temporary) - _______ kV</td>
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<td>Removal of Overhead Electric Transmission - _______ kV</td>
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Section 663 - Electric Transmission Systems

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<td>Item No. 663</td>
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663.5.01 Adjustments

General Provisions 101 through 150.
DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

SPECIAL PROVISION
PROJECT:
COUNTY: Richmond GA and Aiken SC
PI NO: 210327-

Section 664 - Electric Distribution Systems

Add the following:

664.1 General Description
This Work consists of furnishing materials, labor, tools, equipment, and other items necessary for the installation, relocation, and adjustment of overhead and underground electric distribution systems in accordance with the Project plans, Work Summary Location Reports, and Specifications. Correct all deficiencies in the Work indicated by testing, inspecting, and as directed by the Engineer.

664.1.01 Definitions
General Provisions 101 through 150

Whenever the terms “Company” or “Georgia Power Company” are used in this Special Provision and its related documents, they mean Georgia Power Company, Inc., its subsidiaries, successors and/or assigns. Whenever the term “Plan” is used in this Special Provision and related documents, this includes the Electric Distribution Relocation Plans. The term “Southern Company” is synonymous with Georgia Power Company.

The term “Distribution Engineer” means the Company’s authorized individual having the authority to give instructions pertaining to the Work. The Distribution Engineer has authority to approve or reject the Work and otherwise represent the Company. The “Distribution Engineer” is not authorized to revoke, alter, enlarge, relax, or release any requirements of the Contract, Plans, and Specifications nor will they act as an agent for the Contractor. Ensure Distribution Engineer has access to all of the Work for inspection and testing. Ensure Distribution Engineer attends Closing Conference and Final Inspection.

During emergency situations involving the Company’s facilities, such as weather related incidents or power outages, or for system maintenance, the Distribution Engineer has the authority to direct the Work and to add Company crews as necessary. Additional items required for any emergency work, power outages, or system maintenance will be addressed as specified in Section 104.03 Alteration of Plans or Character of Work.
Section 664 - Electric Distribution Systems

664.1.02 Related References
General Provisions 101 through 150

A. Standard Specifications

Section 201-Clearing and Grubbing
Section 205-Roadway Excavation
Section 207-Excavation and Backfill for Minor Structures
Section 208-Embankments
Section 209-Subgrade Construction
Section 310-Graded Aggregate Construction
Section 400-Hot Mix Asphaltic Concrete Construction
Section 441-Miscellaneous Concrete
Section 500-Concrete Structures
Section 852-Miscellaneous Steel Materials
Section 861-Piling and Round Timber
Section 863-Preservative Treatment of Timber Products

B. Related Documents

   Available from the Institute of Electrical and Electronics Engineers
   http://www.ieee.org/portal/site/iportals/

For copies of Southern Company’s distribution standards, please contact:

Georgia Power Company
Mr. Mark Tilden
Bin 10140
241 Ralph McGill Boulevard, NE
Atlanta, Georgia 30308-3374
404-506-4203

If there is a conflict or discrepancy between the Specifications and the Southern Company Standards or the National Electric Safety Code, perform the Work in accordance with the Southern Company Standards and National Electric Safety Code, current editions. If the Southern Company Standards and National Electric Safety Codes are revised after notice to contractors date, perform the Work specified in the Plans, Work Location Summary Reports, and Specifications using the revised standards and codes. If revisions to the Southern Company Standards and National Electric Safety Codes are dated on or after the letting dates shown on the bid proposal, notify the Engineer in writing of such revisions.

664.1.03 Submittals
General Provisions 101 through 150

Refer to the Southern Company Overhead Distribution Standards and Southern Company Underground Distribution Standards, current published edition, for electric utility submittal requirements.
Section 664 - Electric Distribution Systems

A. Completion Letter and As-Built Documentation

Provide no later than 30 days after the completion of the work a Completion Letter and As-Built Documentation to both the Engineer and the Contract Coordinator consisting of the following information.

1. Include in the Completion Letter the date all electrical pay items are completed and ready to be turned over to the Company. Also, include a detailed estimate of quantities in place and explanation of any deviations or overruns.
2. Provide As-Built Documentation of the in-place and accepted electrical facilities. Documentation shall consist of two sets of full size plans and electronic files in the form of a Bentley MicroStation file using the same version and format in which the Electrical Distribution Plans were created.

664.2 Materials

A. Overhead and Underground Electric Distribution System

Any new materials required for the construction of proposed electric facilities shown on the Plans and listed in the Work Location Summary Reports are to be purchased from Georgia Power Company. When required by the Plans and Work Location Summary Reports, transfer all existing materials to the required locations as specified. Replace in-kind any existing material damaged during transfer.

Any other materials needed to complete the electric distribution system installation shall be transferred from the existing locations specified in the Plans. Incidental materials required to complete the Work will be supplied by the Contractor. Ensure all materials used are in conformance with the requirements and standards set forth in the Southern Company Overhead Distribution Standards and Southern Company Underground Distribution Standards, current edition. Items required for the Work but not shown in the Plans or the Work Location Summary Reports will require the review and approval by the Engineer and Distribution Engineer prior to incorporating such material into the Work. If there are revisions to the Work, the Company will provide a revised material list. The additional items required for the Work will be addressed as specified in Section 104.03 Alteration of Plans or Character of Work.

Because Georgia Power Company is supplying materials necessary for the Work, do not request a Materials Allowance as provided for in Section 109.07 Partial Payments

664.2.01 Delivery, Storage, and Handling

General Provisions 101 through 150

Coordinate with the Georgia Power Company representative listed below to ensure all necessary materials are available for installation as required on the Plans, including the roadway staging plans. Follow any delivery, storage and handling procedures set forth in the Southern Company Overhead Distribution Standards and Southern Company Underground Distribution Standards, current edition. Coordinate with Georgia Power Company to take delivery of required material, load required material, and transport all required material to the project. All of the material may be picked up from Georgia Power Company at once or receipt can be made on an as needed basis. If material storage is required, properly store the material at pre-approved locations within the project limits or at pre-approved locations off the project limits. Return or dispose of all unused and remaining material as detailed in subsection 664.3.05.H.

The Contractor is responsible for all materials from the time of receipt from Georgia Power Company to the return of remaining materials to Georgia Power Company or disposal. When all Work is complete, the Distribution Engineer, in the presence of the Engineer and Contractor, will field verify and document the Work’s in-place material. From the Distribution Engineer’s field work, verify with the Engineer and Distribution Engineer material quantities used are in-line with what was taken from the Company and what was returned to the Company.

Georgia Power Company
Section 664 - Electric Distribution Systems

Mr. Mark Tilden
Bin 10140
241 Ralph McGill Boulevard, NE
Atlanta, Georgia 30308-3374
404-506-4203

664.3 Construction Requirements

664.3.01 Personnel
General Provisions 101 through 150

Ensure the construction and installation of all electric distribution facilities is performed by a subcontractor who is prequalified with Georgia Power Company and is registered with the Department. Contact the Georgia Power Company representative listed below to obtain a list of prequalified electric contractors. Electric contractors not prequalified with Georgia Power Company will not be registered and approved as a subcontractor for the Department. Ensure the distribution contractor selected for the bidding process is prequalified with Georgia Power Company.

Georgia Power Company
Mr. Mark Tilden
Bin 10140
241 Ralph McGill Boulevard, NE
Atlanta, Georgia 30308-3374
404-506-4203

664.3.02 Equipment
General Provisions 101 through 150

Ensure all equipment used is in conformance with the requirements and standards set forth in the Southern Company Overhead Distribution Standards and Southern Company Underground Distribution Standards, current edition. Obtain prior approval from the Engineer before starting Work on specialty items such as boring equipment and others of similar complexity.

664.3.03 Preparation
General Provisions 101 through 150


664.3.04 Fabrication
General Provisions 101 through 150

Ensure fabrication procedures and requirements conform to those set forth in Southern Company Overhead Distribution Standards and Southern Company Underground Distribution Standards, current edition. Submit shop drawings to the
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Engineer and Distribution Engineer for any items requiring fabrication. Obtain approval from the Engineer and Distribution Engineer prior to ordering materials.

664.3.05 Construction
Review the Plans and Work Summary Location Reports to ensure all items required for the Work are included in the price bid for each electric distribution bid item. Provide a detailed list of materials required to complete the Work to the Engineer and Distribution Engineer prior to ordering and taking delivery from Georgia Power Company. In the required detailed list of materials, identify any material required to complete the Work not shown in the Plans or in the Work Summary Location Report. The contractor will need to confirm that all easements have been acquired and dependent activities have been completed before any work can commence in the affected areas.

A. Permission to Enter Private Property
Comply with Section 107—Legal Regulations and Responsibility to the Public.

Through an agreement between the Department and the Company; the Contractor is given the permission to enter upon private properties found outside the project’s construction limits. This permission is granted for the sole purpose of activities relating to the installation and/or adjustments of distribution facilities only and is limited to the area of existing easements obtained by the company. Such permission to enter upon private properties is temporary and such rights commence upon project award and automatically expire upon completion and project final acceptance by the Department.

In all cases where it is necessary to enter upon private property; it is the Contractors sole responsibility to minimize any disruptions to personal property in the commencement of such work thereof. Additionally, the following restrictions and requirements apply:

1. All Work is limited to the installation, relocation, or replacement of distribution facilities, including the Work necessary to restore each private property as required in number 6 of this subsection.
2. Notify the Engineer and the private property owner, and resident 72 hours before commencing Work on said private property.
3. Only vehicles and equipment required for the Work are allowed on any private property.
4. Do not store any materials, vehicles, or equipment on any private property longer than the duration required to perform the Work.
5. Do not use any private property as an on-site detour or vehicle path.
6. Immediately following any construction located on private property, restore all areas of the same parcel to a condition substantially the same as existed immediately prior to any such disturbances, including without limitation, any and all necessary repairs, and replacement of grassing, landscaping and pavement which may be removed and excavated by the Contractor. Ensure all necessary repairs are made to restore the original contours and re-establish the ground cover to control erosion.

B. Finding Existing Underground Utilities and Obstructions
Comply with Subsection 107.13 and Subsection 107.21. When unforeseen conflicts or site conditions require Plan changes, perform the Work as altered according to Subsection 104.03 and Subsection 104.04.

Follow all customer notification requirements and obtain approval from the Distribution Engineer prior to disrupting existing services required for the installation of the distribution facilities shown on the Plans and Work Summary Location Reports and for the installation of any required temporary distribution facilities.
C. Installation of Electric Distribution Systems
Follow all relevant procedures set forth in the Southern Company Overhead Distribution Standards and Southern Company Underground Distribution Standards, current published edition. Construct all temporary and proposed electric distribution facilities in accordance with the requirements set forth in the Plans, Work Location Summary Reports, and as instructed by the Distribution Engineer.

D. Excavating Trenches
Excavate trenches to the proper grade, depth, and width as follows:

1. Trench to Grade
   - Ensure excavated trench bottoms are firm, free from boulders, and conform to the established grade.
   - Backfill, according to Section 207, any part of the trench excavated below the established grade. Use Class I or Class II Soils (Section 810), and firmly compact the soil.
   - Where the established grade of a trench is in rock, undercut the bottom of the trench by at least 6 in (150 mm), then backfill and compact according to Section 207.
   - Conduct blasting operations according to Subsection 107.12.
   - Excavate trenches in pavement to grade as follows:
     i. Remove the pavement according to GDOT construction standard 1401.
     ii. Directional bore under existing sidewalks, curbs, gutters, and pavements according to Section 615.

2. Minimum Trench Depth
   - Excavate trenches to provide at least 48 in (1.2 m) cover depth from the Work to the finished pavement surface, sidewalk, grass plot, etc. unless indicated otherwise on the Plans or by the Engineer.
   - If any part of a distribution facility is to be placed in or under a new embankment, finish the embankment to at least a 2 ft (600 mm) plane above the top of the proposed facility before excavating the trench.

3. Trench Width
   - Excavate trenches wide enough to allow proper installation of the Work.

E. Directional Boring
This Work consists of installing various sizes of bores by directional boring through whatever materials may be encountered. Furnish, for the Engineer’s approval, a plan showing the proposed methods for the installation of the horizontal directional bore. The Engineer will review the proposed installation plan within 10 working days of receipt by the Department. No directional boring Work will be allowed until the Contractor’s submitted plan is approved by the Engineer. Include the following detail in the plan, as a minimum:

1. List of projects completed by the company performing the boring operation, environment of installation (urban work, river crossing, freeway), diameter of product installation and length of bores. Include the name, address and phone number of an owner’s representative with knowledge of the performance of the Work. Provide at least five previously completed projects of similar scope as the boring Work included in this contract.

2. List of the Contractor’s key personnel with a resume of boring experience. The Department will be the sole judge of the qualifications of the foreman and the drill operators.

3. Location of all proposed boring entry and exit pits.

4. Proposed alignment of bore both horizontal and vertical. For the proposed alignment, maintain a minimum clearance of 18 inches (450 mm) or 2 times the diameter of the final product installation, whichever is greater, at any obstruction. Do not perform boring in select backfill areas such as at mechanically stabilized wall locations.
Section 664 - Electric Distribution Systems

5. Proposed diameter of bore. This diameter is the diameter of the final product installation.

6. Proposed diameter of pilot borehole.

7. Proposed diameter of back reamer. Do not allow the diameter of the back reamer to exceed 1.5 times the diameter of the final product installation.

8. Proposed depth of cover. Ensure the depth of cover will be equal to or greater than 10 times the diameter of the final product installation. Under paved shoulders, maintain a minimum depth of cover of 4 feet (1.22 meters). Under travel lanes or outside of paved shoulders, maintain a minimum depth of cover of 8 feet (2.44 meters).

9. Evaluation of soil conditions to be encountered. A complete soil survey is not required. As a minimum, excavate the entrance and exit pits for the proposed bore and determine the nature of the material likely to be encountered. Base the drilling fluid composition on the evaluation of the materials encountered in the bore pit excavation.


11. Proposed drilling fluid pressure and flow rates.


13. Proposed pull back rate.

14. Type of tracking system.

Excavate suitable pits or trenches for the boring operation and for placing end joints or termination connectors of conduit when required. Securely sheet and brace pits or trenches where necessary to prevent caving. Where directional boring is required under railroads, highways, streets or other facilities, perform construction in a manner that will not interfere with the operation of the facility, and not weaken the roadbed or structure. Do not disturb or excavate any roadway pavement, subgrade, roadbed, paved shoulder, or unpaved median as part of the boring or pipe placing operation for any reason without written authorization by the Engineer.

In the above areas, unless otherwise authorized in writing by the Engineer, abandon in place any broken or damaged boring rod/stem, boring head (including transmitter/transponder locating heads and cutter heads), couplings (including back reaming, swivel or connector couplings), or any other material that cannot be retrieved as part of the pullback operation. Abandoned material will become the property of the Department. No additional payment for abandoned material will be made.

Continuously monitor the location and alignment of the pilot drill progress to ensure compliance with the proposed installation alignment and to verify depth of the bore. Accomplish monitoring by manual plotting based on location and depth readings provided by the locating/tracking system or by computer generated bore logs which map the bore path based on information provided by the locating/tracking system. Obtain readings or plots on every drill rod and provide to the Engineer on a daily basis for as-built plans.

Monitor drilling fluids such as the pumping rate, pressures, viscosity and density during the pilot bore, back reaming, and/or pipe installation stages to ensure adequate removal of soil cuttings and to ensure the stability of the borehole is maintained. Do not allow drilling fluid pressures to exceed that which can be supported by the overburden (soil) pressure to prevent heaving or a hydraulic fracture of the soils. Contain excessive drilling fluids at the entry and exit points until recycled or removed from the site. Dispose of all drilling fluids in a manner acceptable to the appropriate local, state and federal regulations. The Work will be immediately suspended whenever drilling fluids seep to the surface other than in the boring entrance or exit pit. Propose a method to prevent further seepage and remove and dispose of any drilling fluid on the surface prior to resuming the boring operation.

To minimize heaving during pullback, determine the pullback rate to maximize the removal of soil cuttings and minimize compaction of the ground surrounding the borehole. Ensure the pullback rate minimizes overcutting of the borehole during the back reaming operation to ensure excessive voids are not created resulting in post installation settlement. Restore any
Section 664 - Electric Distribution Systems

surfaces damaged by the Work to their preconstruction conditions. All costs associated with the restoration are to be borne by the Contractor.

The distance the excavation extends beyond the end of the bore will depend upon the character of the excavated material. Do not exceed 2 feet (0.61 meters) in any case. If the character of the material being excavated makes it desirable, decrease the distance on instructions from the Engineer. Once the directional boring has commenced, insofar as practical, continue the operation without interruption. After the boring has been completed, immediately backfill the pits or trenches excavated to facilitate boring operations.

Proceed with the Work from a surface staging area provided for the boring equipment and workers. Obtain approval from the Engineer on the proposed location of the staging area. Bore the holes mechanically. Place excavated material near the top of the working pit and dispose of as required. Water or other fluids in connection with the boring operation will be permitted only to the extent necessary to lubricate cutting. Do not perform jetting. Excavation will not be measured for payment.

In unconsolidated soil formations, a gel-forming colloidal drilling fluid consisting of at least 10% high grade carefully processed bentonite may be used to consolidate excavated material, seal the walls of the hole, and furnish lubrication for subsequent removal of material and immediate back reaming/installation of conduit. Continuously monitor and maintain the flow pressure on the drilling fluid at the minimal pressure required to place the fluid. In normal circumstances, do not exceed a flow pressure of 200 psi (1379 k Pa). At any time during boring operations, do not exceed a flow pressure of 500 psi (3448 k Pa). Remove all drilling fluid spoils from both ends of the bore and properly dispose of material at a properly permitted location.

The maximum allowable variation fromline and grade is a maximum of 2 percent. Pressure grout any voids, with an approved mix, that develop during the installation operation and are determined by the Engineer to be detrimental to the Work.

Directional boring operations inherently include the risk of encountering below grade obstructions that begin to alter the bore direction. Should an obstruction be encountered, notify the Engineer immediately. Boring deeper or shallower (if minimum pipe depth can be maintained), moving the boring head to the right or left of the obstruction, or attempt to bore through the obstruction (if other than solid rock) are acceptable corrective measures to restore bore alignment. To restore the bore alignment, perform a minimum of three attempts at each encountered obstruction with different corrective measures. The Engineer may authorize a relocation of the bore if a suitable bore alignment cannot be restored.

F. Removals

Follow all relevant procedures set forth in the Southern Company Overhead Distribution Standards and Southern Company Underground Distribution Standards, current published edition. Remove all temporary and existing electric distribution facilities in accordance with the requirements set forth in the Plans, Work Location Summary Reports, and as instructed by the Distribution Engineer. Cutting of poles specified for removal or abandonment will not be permitted. Remove pole(s) and backfill void in accordance with Section 207. Backfill any voids remaining from the removal of underground facilities in accordance with Section 207. Replace, in-kind (material and depth), any voids remaining in roadway structures.

G. Transfers

Follow all relevant procedures set forth in the Southern Company Overhead Distribution Standards and Southern Company Underground Distribution Standards, current published edition. Transfer all electric distribution facilities in accordance with the requirements set forth in the Plans, Work Location Summary Reports, and as instructed by the Distribution Engineer.

H. Remaining Material
Section 664 - Electric Distribution Systems

1. Material Originating from Georgia Power Company

    Return all unused material to Georgia Power Company. The Distribution Engineer will verify and accept or reject all returned material. No credit will be given the Contractor for any material rejected by Georgia Power Company due to, but not limited to, damage, material loss, or material theft.

2. Material Originating from the Project Site – Existing or Surplus Material

    Properly dispose of all surplus material. With exception to transformers, surplus and properly dispose of any material originating from the project and is not required, or no longer required, for the completion of the Work. Return all transformers to Georgia Power Company.

I. Staging, Mobilization, and De-mobilization

    Perform the Work in accordance with the staging plans. If there are changes to the staging plans, obtain concurrence from the Engineer and Distribution Engineer. There will be no separate measurement and payment for mobilization or de-mobilization required by the staging plans or required by the staging plans proposed by the Contractor.

664.3.06 Quality Acceptance

A. Testing

    Follow all relevant procedures set forth in the Southern Company Overhead Distribution Standards and Southern Company Underground Distribution Standards, current edition. Ensure Distribution Engineer is present at all inspection and testing. Correct all deficiencies in the Work indicated by testing, inspecting, and as directed by the Engineer or Distribution Engineer.

B. Semi-Final Utility Inspection

    When the contractor has finished the Electrical Distribution System Work, the Contractor may, by written notice, request that a semi-final utility inspection be made. The Engineer, along with the Distribution Engineer, will determine if the Electrical Distribution System Work is ready for semi-final utility inspection. The Engineer, in agreement with the Distribution Engineer, will have the final decision on when the Electrical Distribution System Work is complete and thereby ready for semi-final utility inspection. If all the Electrical Distribution System Work provided for and contemplated by the Contract is found to be complete to the Engineer's satisfaction and all documents required in connection with the Electrical Distribution System Work has been submitted and accepted then, the Contractor may request transfer of the completed Electrical Distribution System Work to the Owner.

    Once the new facilities are in service and accepted by the Owner, provide written correspondence notifying the Engineer and Owner that utility location services will be the responsibility of said Owner.

    Such partial acceptance shall in no way relieve the Contractor of the responsibility for satisfactory completion of the Contract, or for failure of any portion of the Electrical Distribution System Work prior to Final Acceptance of the Project.

664.3.07 Contractor Warranty and Maintenance

General Provisions 101 through 150
Section 664 - Electric Distribution Systems

664.4 Measurement
Overhead and underground electric distribution systems, and other items of Work in this Specification, in place, operational, and accepted, are measured for payment as follows:

A. Overhead Electric Distribution
Overhead Electric Distribution and secondary/service lines are measured in linear feet for each size (kV or V) facility installed. The facility is measured along the centerline of the facility from pole structure to pole structure through all fittings, switches, and transformers and shall include the installation of the pole structures and any materials required by the Southern Company Overhead Distribution Standards and Southern Company Underground Distribution Standards, current edition. Measurement includes all wire to complete the work regardless of the number of phase conductors specified or transferred. Measurement will begin and end at existing pole structures where the newly installed Work ties back to the existing facility or specified ending structure. There will be no compensation for replacement of damaged or lost materials. Measurement and payment for the transfer of existing materials to new location will be made in the same manner as a new installation. Include the costs of transferring materials in the costs for the installation of Overhead Electric Distribution System, temporary or permanent. If shown on the Plans, installation of distribution secondary/service lines will be measured from the newly installed pole structure to the existing residential or commercial pole structure or first attachment even if transferred. Obtain measurements with electronic survey equipment and provide Engineer with printout of installed facilities indicating State Plane Coordinates and station numbers of each pole structure and indicate distances between pole structures starting from the beginning of the Work (existing facility pole structure).

B. Overhead Electric Distribution (Temporary)
Temporary Overhead Electric Distribution and secondary/service lines are measured in linear feet for each size (kV or V) facility installed. The facility is measured along the centerline of the facility from pole structure to pole structure though all fittings, switches, and transformers and shall include the installation of the pole structures and any materials required by the Southern Company Overhead Distribution Standards and Southern Company Underground Distribution Standards, current edition. Measurement includes all wire to complete the work regardless of the number of phase conductors specified or transferred. Measurement will begin and end at existing pole structures where the newly installed Work connects to the existing facility or specified ending structure. There will be no compensation for replacement of damaged or lost materials. Measurement and payment for the transfer of existing materials to new location will be made in the same manner as a new installation. Include the costs of transferring materials in the costs for the installation of Overhead Electric Distribution System, temporary or permanent. Obtain measurements with electronic survey equipment and provide Engineer with printout of installed facilities indicating State Plane Coordinates and station numbers of each pole structure and indicate distances between pole structures starting from the beginning of the Work (existing facility pole structure).

C. Underground Electric Distribution
Underground Electric Distribution and secondary/service lines are measured in linear feet for each size (kV or V) facility installed. The facility is measured along the top and center of cable(s) from structure to structure through junction boxes, transformers, and vaults and shall include the installation of the pole structures and any materials required by the Southern Company Overhead Distribution Standards and Southern Company Underground Distribution Standards, current edition. Measurement includes all wire to complete the work regardless of the number of phase conductors specified. Measurement will begin and end at existing pole structures, vault structures, splice point, or termination cabinet where the newly installed Work connects to the existing facility. All measurements will begin and terminate at the intersection of the structure and grade. Measurement for buried facilities that transition up pole structures to tie to the overhead facilities will not be made. There will be no compensation for replacement of damaged or lost materials. There will be no separate measurement and
payment for the transfer or uncovering and relocating of existing materials to new location. Include the costs of transferring materials in the costs for the installation of Underground Electric Distribution System, temporary or permanent. Measurement of unsuccessful boring attempts will not be made. Successful directional bores will not be measured for payment.
Obtain measurements with electronic survey equipment and provide Engineer with printout of installed facilities indicating State Plane Coordinates and station numbers of each underground structure and pole structure and indicate distances between structures starting from the beginning of the Work (existing facility structure).

D. Installation of Poles
Installation of Steel, Concrete, and Wood Poles will not be measured separately for payment. Steel, Concrete, and Wood Poles are included in the measurement of the overhead or underground electric distribution, permanent or temporary.

E. Installation of Electric Wire
Installation of Electric Wire will not be measured separately for payment. Wire is included in the measurement of the overhead or underground electric distribution, permanent or temporary.

F. Removal of Overhead Electric Distribution
Removal of the Overhead Electric Distribution and secondary/service lines are measured in linear feet for each size (kV or V) facility removed. The facility is measured along the centerline of the facility from pole structure to pole structure through the equipment mounted on the poles including, but not limited to, wire, transformers, switches, capacitor banks, street lights, and reclosers. Measurement will begin and end at existing pole structures where the distribution facility specified for removal connects to the existing facility to remain. There will be no compensation for replacement of damaged or lost materials. There will be no separate measurement and payment for backfilling of voids remaining from removal or replacement of roadway section. Measurement includes the removal of all wire regardless of the number of phase conductors specified. If shown on the Plans, removal of distribution secondary/service lines will be measured from the existing distribution pole specified to be removed to the existing residential or commercial pole structure or first attachment. Measurement and payment where existing materials is to be transferred will be made in the same manner as removed.
Obtain measurements with electronic survey equipment and provide Engineer with printout of existing facilities indicating State Plane Coordinates and station numbers of each pole structure and indicate distances between pole structures starting from the beginning of the Work (existing facility pole structure). Obtain approval from the Engineer of existing measurements prior to beginning removal Work.

G. Removal of Overhead Electric Distribution (Temporary)
Removal of the Overhead Electric Distribution (Temporary) and secondary/service lines are measured in linear feet for each size (kV or V) facility removed. The facility is measured along the centerline of the facility from pole structure to pole structure through the equipment mounted on the poles including, but not limited to, wire, transformers, switches, capacitor banks, street lights, and reclosers. Measurement will begin and end at existing pole structures where the distribution facility specified for removal connects to the existing facility to remain. There will be no compensation for replacement of damaged or lost materials. There will be no separate measurement and payment for backfilling of voids remaining from removal or replacement of roadway section. Measurement includes the removal of all wire regardless of the number of phase conductors specified. If shown on the Plans, removal of temporary distribution secondary/service lines will be measured from the existing distribution pole specified to be removed to the existing residential or commercial pole structure or first attachment. Measurement and payment where temporary materials are to be transferred will be made in the same manner as removed.
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Obtain measurements with electronic survey equipment and provide Engineer with printout of existing facilities indicating State Plane Coordinates and station numbers of each pole structure and indicate distances between pole structures starting from the beginning of the Work (existing facility pole structure). Obtain approval from the Engineer of existing measurements prior to beginning removal Work.

H. Removal of Underground Electric Distribution
Removal of Underground Electric Distribution and secondary/service lines are measured in linear feet for each size (kV or V) facility removed. The facility is measured along the top and center of cable(s) from structure to structure through junction boxes, transformers, and vaults and shall include the removal, if required by the plans, of any materials that are integral to the temporary facility. This includes, but is not limited to, junction boxes, transformers, switching cubicle, and vaults. Measurement will begin and end at existing pole structures or vault structures where the newly installed facility connects to the existing facility. There will be no compensation for replacement of damaged or lost materials. There will be no separate measurement and payment for backfilling of voids remaining from removal or replacement of roadway section. Measurement includes the removal of all wire regardless of the number of phase conductors specified.

Obtain measurements with electronic survey equipment and provide Engineer with printout of existing facilities indicating State Plane Coordinates and station numbers of each underground structure and pole structure and indicate distances between structures starting from the beginning of the Work (existing facility structure). There will be no measurement and payment for backfilling of voids left by removed underground equipment. Obtain approval from the Engineer of existing measurements prior to beginning removal Work.

I. Removal of Poles
Removal of Steel, Concrete, and Wood Poles will not be measured separately for payment. Removal is included in the measurement of the removal of overhead or underground electric distribution, permanent or temporary.

664.01 Limits
General Provisions 101 through 150

664.5 Payment
The Contract Unit Price for each Item shall include all costs incidental to the construction of the Item according to the Plans, Work Summary Location Report, and as specified in this Section. All such surplus items will become the property of Georgia Power Company unless otherwise specified. Payment for any Item listed below is full compensation for the Item or Items in place, operational, and accepted.

A. Overhead Electric Distribution
Overhead Electric Distribution and secondary/service lines will be paid for at the contract unit price per linear foot for each size (kV or V) facility installed. Payment is full compensation for material, handling, delivery, and storage of material and installation of material in accordance with the Plans and Work Summary Location Reports. Payment is full compensation for necessary handling and delivery of surplus material to Georgia Power Company. Payment is full compensation for all the necessary material, equipment and labor to install the Overhead Electric Distribution, including all items necessary and items specified in the Work Summary Location Report and Plans. Payment is full compensation for the entire linear feet required to span the portion of the project specified and to tie back to existing facilities. This includes items such as wire (regardless of the number of phase conductors specified), transformers, poles (wood, steel, or concrete), framing assemblies, utility assemblies, conductors, hardware, guy assemblies, street lights, switches, capacitor banks, reclosers and any other item(s)
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necessary to provide for an in place and accepted operational Overhead Electric Distribution of the size specified in the Plans and Work Summary Location Report.

B. Overhead Electric Distribution (Temporary)
Temporary Overhead Electric Distribution and secondary/service lines will be paid for at the contract unit price per linear foot for each size (kV or V) facility installed. Payment is full compensation for material, handling, delivery, and storage of materials and installation of materials in accordance with the Plans and Work Summary Location Reports. Payment is full compensation for any work required to accommodate project staging, detours, or structures not shown on the Plans or Work Summary Location Reports. Payment is full compensation for necessary handling and delivery of surplus material to Georgia Power Company. Payment is full compensation for all the necessary material, equipment and labor to install the Temporary Electric Distribution, including all items necessary and items specified in the Work Summary Location Report and Plans. Payment is full compensation for the entire linear feet required to span the portion of the project specified and to tie back to existing facilities. This includes items such as wire (regardless of the number of phase conductors specified), transformers, poles (wood, steel, or concrete), framing assemblies, utility assemblies, conductors, hardware, guy assemblies, street lights, switches, capacitor banks, reclosers and any other item(s) necessary to provide for an in place and accepted operational Overhead Electric Distribution of the size specified in the Plans and Work Summary Location Report.

C. Underground Electric Distribution
Underground Electric Distribution will be paid for at the contract unit price per linear foot for each size (kV) facility installed. Payment is full compensation for material, handling, delivery, and storage of material and installation of material in accordance with the Plans and Work Summary Location Reports. Payment is full compensation for necessary handling and delivery of surplus material to Georgia Power Company. Payment is full compensation for all the necessary material, equipment and labor to install the Underground Electric Distribution, including all items necessary and items specified in the Work Summary Location Report and Plans. Payment is full compensation for the entire linear feet required to traverse, below grade, the portion of the project specified and to tie back to existing facilities. This includes items such as directional boring, wire (regardless of the number of phase conductors specified), conduit, transformers, vaults, switching cubicle, hardware, and any other item(s) necessary to provide for an in place and accepted operational Underground Electric Distribution of the size specified in the Plans and Work Summary Location Report. Payment of unsuccessful boring attempts will not be made. Successful directional bores will not be paid for separately.

D. Installation of Poles
No separate payment will be made for the installation of Steel, Concrete, or Wood Poles. Costs for the installation of poles are included in the price for overhead or underground electric distribution, permanent or temporary.

E. Installation of Electric Wire
No separate payment will be made for the installation of electric wire. Costs for the installation of electric wire are included in the price for overhead or underground electric distribution, temporary or permanent.

F. Removal of Overhead Electric Distribution
Removal of Overhead Electric Distribution and secondary/service lines will be paid for at the contract unit price per linear foot for each size (kV or V) facility removed. Payment is full compensation for removal, handling, delivery, storage, and surplus of materials. Payment is full compensation for necessary handling and delivery of surplus material to Georgia Power Company. Payment is full compensation for all the necessary material, equipment and labor to remove the Overhead Electric Distribution. Payment is full compensation for the entire linear feet removed back to existing or new facilities as shown on the plans. This includes items such as wire (regardless of the number of phase conductors specified), transformers, poles
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(wood, steel, or concrete), framing assemblies, utility assemblies, conductors, hardware, guy assemblies, street lights, and any other item(s) necessary for complete removal.

All material removed and not re-used becomes the property of Georgia Power Company. Payment for Removal of Overhead Electric Distribution includes the removal, handling, delivery, and off-loading of all material at a Georgia Power Company Operating Headquarters specified by the Distribution Engineer.

G. Removal of Overhead Electric Distribution (Temporary)
Removal of Overhead Electric Distribution and secondary/service lines (Temporary) will be paid for at the contract unit price per linear foot for each size (kV or V) facility removed. Payment is full compensation for removal, handling, delivery, storage, and surplus of materials. Payment is full compensation for all the necessary equipment and labor to remove the Temporary Electric Distribution. Payment is full compensation for the entire linear feet removed back to existing or new facilities as shown on the Plans. This includes items such as wire (regardless of the number of phase conductors specified), transformers, poles (wood, steel, or concrete), framing assemblies, utility assemblies, conductors, hardware, guy assemblies, street lights, and any other item(s) necessary for complete removal.

All material removed and not re-used becomes the property of Georgia Power Company. Payment for Removal of Overhead Electric Distribution (Temporary) includes the removal, handling, delivery, and off-loading of all material at a Georgia Power Operating Headquarters specified by the Distribution Engineer.

H. Removal of Underground Electric Distribution
Removal of Underground Electric Distribution and secondary/service lines will be paid for at the contract unit price per linear foot for each size (kV or V) facility removed. Payment is full compensation for removal, handling, delivery, storage, and surplus of materials. Payment is full compensation for all the necessary equipment and labor to remove the Underground Electric Distribution. Payment is full compensation for the entire linear feet removed back to existing or new facilities as shown on the Plans. This includes removal of items such as wire (regardless of the number of phase conductors specified), conduit, transformers, vaults, hardware, and any other item(s) necessary for complete removal.

All material removed and not re-used becomes the property of Georgia Power Company. Payment for Removal of Overhead Electric Distribution includes the removal, handling, delivery, and off-loading of all material at a Georgia Power Operating Headquarters specified by the Distribution Engineer.

I. Removal of Poles
No separate payment will be made for the removal of Steel, Concrete, or Wood Poles. Costs for the removal of poles are included in the price for removal of overhead or underground electric distribution, permanent or temporary.

Payment will be made under:

<table>
<thead>
<tr>
<th>Item No. 664</th>
<th>Overhead Electric Distribution - _______ kV</th>
<th>Per linear foot (meter)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item No. 664</td>
<td>Overhead Electric Distribution (Secondary/Service) - _______ kV</td>
<td>Per linear foot (meter)</td>
</tr>
<tr>
<td>Item No. 664</td>
<td>Overhead Electric Distribution (Temporary) - _______ kV</td>
<td>Per linear foot (meter)</td>
</tr>
<tr>
<td>Item No. 664</td>
<td>Underground Electric Distribution - _______ kV</td>
<td>Per linear foot (meter)</td>
</tr>
<tr>
<td>Item No. 664</td>
<td>Removal of Overhead Electric Distribution - _______ kV</td>
<td>Per linear foot (meter)</td>
</tr>
</tbody>
</table>
Section 664 - Electric Distribution Systems

<table>
<thead>
<tr>
<th>Item No. 664</th>
<th>Description</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>664</td>
<td>Removal of Overhead Electric Distribution (Secondary/Service) - _____kV</td>
<td>Per linear foot (meter)</td>
</tr>
<tr>
<td>664</td>
<td>Removal of Overhead Electric Distribution (Temporary) - _______kV</td>
<td>Per linear foot (meter)</td>
</tr>
<tr>
<td>664</td>
<td>Removal of Underground Electric Distribution - _______kV</td>
<td>Per linear foot (meter)</td>
</tr>
</tbody>
</table>

664.5.01 Adjustments

General Provisions 101 through 150

Office of Utilities
22.1 First Use Date: January 26, 2007

1st Revised: February 14, 2008

2nd Revised: March 30, 2011

3rd Revised: August 23, 2012

22.1.1

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

23 SPECIAL PROVISION
PROJECT NO:
PI NO: 210327-

Section 665—Gas Distribution System

Add the following:

665.1 General Description
This Work consists of furnishing materials, labor, tools, equipment, and other items necessary for the complete installation abandonment, removal, relocation, and adjustment of gas distribution systems in accordance to the plans and Specifications.

665.1.01 Definitions
General Provisions 101 through 150
Whenever the terms “Company” or [Name of Utility] Natural Gas are used in this Special provision and its related documents, it shall be understood to mean [Name of Utility] Natural Gas its subsidiaries, successors and/or assigns.

The term “Project Coordinator” shall mean the Company’s authorized individual having the authority to give instructions pertaining to the work, to approve or reject the work, and otherwise represent the Company. The “Project Coordinator” shall not however be authorized to revoke, alter, enlarge, relax, or release any requirements of the Contract, Plans, and Specifications nor will they act as an agent for the Contractor.

Blast/Hammer Rock: Any formation requiring blasting or means other than a backhoe or ditching machine.
Section 665—Gas Distribution System

665.1.02 Related References
General Provisions 101 through 150.

A. Standard Specifications
Section 104—Scope of Work
Section 107—Legal Regulations and Responsibility to the Public
Section 108—Prosecution and Progress
Section 205—Roadway Excavation
Section 207—Excavation and Backfill for Minor Structures
Section 210—Grading Complete
Section 400—Hot Mix Asphaltic Concrete Construction
Section 444—Sawed Joints in Existing Pavements
Section 500—Concrete Structures
Section 611—Relaying, Reconstructing or Adjusting to Grade of Miscellaneous Roadway Structures
Section 615—Jacking or Boring Pipe
Section 810—Roadway Materials

B. Related Documents
[Insert relevant documents from utility company]

665.1.03 Submittals
General Provisions 101 through 150.
Refer to the [insert utility company document], current published edition, for gas utility submittal requirements.

A. As-Built Documentation
Submit to the Project Coordinator and the Engineer as built documentation of all work provided in accordance with this specification prior to Final Acceptance of the Project. Include in the as-built documents the following documents as a minimum as they are applicable. Supply any installation diagrams at the time of installation. Deliver as-buils no later than 30 days after completion of installation.

1. As Built Drawings
Provide the Department and [name of utility company] Natural Gas with drawings that detail the final installation route of all gas facilities.

Except for standard bound materials, bind all 8.5”x11” (A4) documentation, including 11” x 17” (A3) drawings folded to 8.5”x11” (A4), in logical groupings in loose-leaf binders of either the 3-ring or plastic slide-ring type. Permanently and appropriately label each such bound grouping of documentation.

Furnish at least five (5) copies of all bound documentation to both the Engineer and the Project Coordinator.

665.2 Materials
Section 665—Gas Distribution System

A. Gas Main and Service Line Pipes, Fittings, and Appurtenances

Ensure all materials provided are in conformance with the requirements and standards set forth in the [name of utility company document], current published edition.

B. Gas Regulator Station

Materials to be included in a gas regulator station shall be as follows:

<table>
<thead>
<tr>
<th>Item #</th>
<th>Quantity</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3</td>
<td>2” Weld Tee Sch 40</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>2” Weld Ell 90 degree Sch 40</td>
</tr>
<tr>
<td>3</td>
<td>2</td>
<td>2” Kerotest Weldball Valve ANSI 300 Regular Port WxW</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1/2” Ball Valve 1000# rated, 1/2”x3” Sch 80 Nipple, 1/2”</td>
</tr>
<tr>
<td>4</td>
<td>5</td>
<td>Threadolet, 1/2” Heavy Steel Screw Plug</td>
</tr>
<tr>
<td>5</td>
<td>2</td>
<td>2” Fisher 627 Regulator - 1/4” orifice 40# set pressure</td>
</tr>
<tr>
<td>6</td>
<td>3</td>
<td>2” Kerotest Weldball Valve ANSI 150 Regular Port WxW</td>
</tr>
<tr>
<td>7</td>
<td>1</td>
<td>2” x 6” Sch 80 Steel Nipple Threaded One End</td>
</tr>
<tr>
<td>8</td>
<td>1</td>
<td>1” Fisher 1808 Right Angle Body Relief Valve set 45”</td>
</tr>
<tr>
<td>9</td>
<td>2</td>
<td>2” x 3” Sch 80 Steel Nipple</td>
</tr>
<tr>
<td>10</td>
<td>1</td>
<td>2”x2”x2” Heavy Steel Threaded Tee</td>
</tr>
<tr>
<td>11</td>
<td>3</td>
<td>2” Sch 80 Steel Pipe Cut to Length</td>
</tr>
<tr>
<td>12</td>
<td>1</td>
<td>2” Rain Cap</td>
</tr>
<tr>
<td>13</td>
<td>1</td>
<td>2” Heavy Steel Screw Cap</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1/2” Ball Valve 1000# rated, 1/2”x3” Sch 80 Nipple, 1/2”</td>
</tr>
<tr>
<td>14</td>
<td>1</td>
<td>Threadolet, 1/2” - 3” Dial Pressure Gauge 0-100# Range</td>
</tr>
<tr>
<td>15</td>
<td>1</td>
<td>1/2” Ball Valve 1000# rated, 1/2”x3” Sch 80 Nipple, 1/2”</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Threadolet, 1/2” - 3” Dial Pressure Gauge 0-500# Range</td>
</tr>
</tbody>
</table>

665.2.01 Materials Certification

For certain products, assemblies, and materials, in lieu of normal sampling and testing procedures by the Contractor, the Company, and the Department, the Engineer and Project Coordinator may accept from the Contractor the manufacturer’s certification with respect to the product involved, under the conditions set forth in the following paragraphs:

1. Ensure certification states/specifies the named product conforms to the [name of utility company document] and representative samples thereof have been sampled and tested as specified.
2. The certification shall either:
Section 665—Gas Distribution System

a. Is accompanied with a certified copy of the test results, or
b. Certify such test results are on file with the manufacturer and will be furnished to the Engineer and Project Coordinator upon demand.

3. Ensure certification states/specifies the name and address of the manufacturer and the testing agency and the date of tests; and sets forth the means of identification which will permit field determination of the product delivered to the project as being the product covered by the certification.

4. Submit certification in duplicate with one copy to be sent with the shipment of the covered product to the Department’s Project Engineer, and with one copy sent to the Department’s State Materials and Research Engineer at 15 Kennedy Drive, Forest Park, Georgia. Ensure certification specifies the project number and contract ID number.

No Certificate will be required for Portland Cement when furnished from a manufacturer approved by the Department.

5. The Department or the Company will not be responsible for any costs of certification or for any costs of the sampling and testing of products in connection therewith.

6. The Department and the Company reserves the right to require samples and to test products for compliance with pertinent requirements irrespective of prior certification of the products by the manufacturer. Any materials that fail to meet specification requirements will be rejected.

665.2.02 Delivery, Storage, and Handling
General Provisions 101 through 150.

Follow all delivery, storage and handling procedures set forth in the [name of utility company document], current published edition.

665.3 Construction Requirements

665.3.01 Personnel
General Provisions 101 through 150.

Ensure that the construction and installation of all gas utilities is performed by a contractor prequalified/registered by [name of utility company]. A prequalified contractor shall be used. Contact [name of utility company] at the following to obtain the current list of [name of utility company] prequalified Contractors:

[name of utility company]
[name of utility company contact person]
[utility company address]
[utility company phone numbers]

665.3.02 Equipment
General Provisions 101 through 150.

Ensure all equipment used is in conformance with the requirements and standards set forth in the [name of utility company document], current published edition.

665.3.03 Preparation
General Provisions 101 through 150.
Section 665—Gas Distribution System

Follow all preparation procedures set forth in the [name of the utility company document], current published edition.

665.3.04 Fabrication

General Provisions 101 through 150.

Ensure fabrication procedures and requirements conform to those set forth in the [name of the utility company document], current published edition.

665.3.05 Construction

A. Permission to Enter Private Property

Comply with Section 107—Legal Regulations and Responsibility to the Public

Through an agreement between the Department and the Company; the Contractor is given the permission to enter upon private properties found outside the project’s construction limits. This permission is granted for the sole purpose of installing gas service lines only and is limited to the area of existing easements obtained by the company. Such permission to enter upon private properties is temporary and such rights shall commence upon project award and automatically expire upon completion and project final acceptance by the Department.

In all cases where it is necessary to enter upon private property; it is the Contractor's sole responsibility to minimize any disruptions to personal property in the commencement of such work thereof. Additionally the following restrictions and requirements shall apply:

1. All work is limited to the installation, relocation, or replacement of gas service lines, including the work necessary to restore each private property as required in number 6 of this subsection.
2. Notify the Engineer and the private property owner, and resident 72 hours before commencing work on said private property.
3. No vehicles or equipment shall be allowed on any private property except for that which is normally required for the installation of said gas service lines.
4. Do not store any materials, vehicles, or equipment on any private property longer than the duration required to perform the said gas service line installation.
5. Do not use any private property as an on-site detour or vehicle path.
6. Immediately following any construction located on private property the contractor at its sole expense shall restore all areas of the same parcel to a condition substantially the same as existed immediately prior to any such disturbances, including without limitation, any and all necessary repairs, and replacement of grassing, landscaping and pavement which may be removed and excavated by the Contractor. Additionally, the Contractor shall be responsible for all necessary repairs to restore the original contours and re-establish the ground cover to control erosion.

B. Finding Existing Underground Utilities and Obstructions

Comply with Subsection 107.13 and Subsection 107.21.

When unforeseen conflicts require Plan changes, perform the work as altered according to Subsection 104.03 and Subsection 104.04.
Section 665—Gas Distribution System

Follow all customer notification requirements and obtain approval from the Project Coordinator prior to disrupting existing any gas services required for the installation of the gas facilities shown on the project plans.

C. Excavating Trenches

Excavate trenches to the proper grade, depth, and width as follows:

7. Trench to Grade
   Ensure excavated trench bottoms are firm, free from boulders, and conform to the established grade.
   a. Backfill, according to Subsection 665.3.05.G, any part of the trench excavated below the established grade. Use Class I or Class II Soils (Section 810), and firmly compact the soil.
   b. Where the established grade of a trench is in rock, undercut the bottom of the trench by at least 6 in (150 mm), then backfill and compact according to Subsection 665.3.05.G.
      Conduct blasting operations strictly according to Subsection 107.12.
   c. Excavate trenches under pavement to grade as follows:
      1) To remove the pavement, cut it at least 24 in (600 mm) wider than each trench edge to provide solid bearing for the pavement edges when replaced. Remove the pavement according to Section 444, except no separate payment will be made for sawed joints.
      2) Directional Bore under existing sidewalks, curbs, gutters, and pavements according to Section 555.
      3) Where possible, jack pipe under an existing pavement according to Section 615, except no separate payment will be made for jacking and boring pipe.

8. Minimum Trench Depth
   Excavate trenches to provide at least 48 in (1.2 m) cover depth from the pipe to the finished pavement surface, sidewalk, grass plot, etc. unless indicated otherwise on the Plans or by the Engineer.
   If any part of a gas main is to be placed in or under a new embankment, finish the embankment to at least a 2 ft (600 mm) plane above the pipe barrel before excavating the trench.

9. Trench Width
   Excavate trenches wide enough to allow proper installation of pipe, fittings, and other materials.

D. Directional Boring

1. Install gas mains and services by means of directional boring at locations shown on the plans or where approved by the Engineer.
2. Ensure the trench width of the excavation conforms to the outside diameter of the pipe as closely as possible.
3. Remove and replace pipe damaged in boring operations at no additional expense to the Department.
4. Use an approved mix to pressure grout voids developed during the installation operation and the Engineer determines are detrimental to the Work.
5. In unconsolidated soil formations, use a gel-forming colloidal drilling fluid with at least 10 percent of high grade carefully processed bentonite to consolidate excavated material, seal the walls of the hole, and lubricate subsequent removal of material and immediate pipe installation.
Section 665—Gas Distribution System

6. Follow all relevant procedures set forth in the [name of utility company document], current published edition.

7. Ensure the total installation includes a locatable conduit system, with identification markers on each DOT right-of-way fence line where applicable.

8. Continuously monitor the location and alignment of the pilot drill progress to ensure compliance with the proposed installation alignment and to verify depth of the bore. Ensure Monitoring is accomplished by computer generated bore logs which map the bore path based on information provided by the locating/tracking system. Ensure readings or plots are obtained on every drill rod, and are provided to the Inspector on a daily basis. Upon completion of the bore the Contractor will furnish the Engineer an As-built drawing along with a report of the Monitoring of the drilling fluids during the pilot hole and back reamed hole.

9. Ensure excess drilling fluids are contained at the entry and exit points until recycled or removed from the site as directed by the Engineer at no additional cost to the Department. Ensure that all drilling fluids are disposed of in a manner acceptable to the appropriate local, state and federal regulations. The Contractor’s work will be immediately suspended by the Engineer whenever drilling fluids seep to the surface other than in the boring entrance or exit pit, or when a paved surface is displaced. The Contractor shall then propose a method to prevent further seepage and/or displacement, and shall remove and dispose of any drilling fluid, slurry and soil from the paved surface prior to resuming the boring operation.

10. Ensure surfaces damaged by the work are restored to their preconstruction conditions at no additional cost to the Department, and with no increase in contract time.

E. Connecting to Existing Gas Mains

Connect to existing gas mains at locations shown on the Plans or where approved by the Engineer or Project Coordinator.

Follow all relevant procedures set forth in the [name of utility company document], current published edition.

F. Laying Gas Mains and Appurtenances

Follow all relevant procedures set forth in the [name of utility company document], current published edition.

G. Installing Gas Mains

Install gas mains at locations shown on the Plans or where approved by the Engineer or Project Coordinator.

Follow all relevant procedures set forth in the [name of utility company document], current published edition.

1. Backfilling

   Furnish equipment, labor, and when necessary material required for backfilling the pipe line trenches according to Section 207.

   d. When testing for leaks in open trenches, do not backfill until testing is complete and leaks are eliminated.
Section 665—Gas Distribution System

e. When retaining pavement adjacent to trenches, replace removed pavement with the same or better material when approved.

f. After backfilling, maintain a smooth riding surface until the repaving is complete. No separate payment will be made for replaced pavement unless a bid Item for this work is contained in the Proposal.

H. Laying Service Lines and Appurtenances

Install service lines at locations shown on the Plans or where approved by the Engineer or Project Coordinator. Install new pipe from the gas main to the final location of the meter or to points approved by the Engineer to connect with existing or future service lines on abutting property.

Follow all relevant procedures set forth in the [name of utility company document], current published edition.

I. Lowering Existing Gas Lines

Lower existing gas mains and services at locations shown on the plans or where approved by the Engineer or Project Coordinator.

Follow all relevant procedures set forth in the [name of utility company document], current published edition.

J. Service Line Tie-Over

Tie existing service line to new service line as shown on the plans or where approved by the Engineer or Project Coordinator. Install new pipe from the gas main to the final location of the Service Line Tie-Over or to points approved by the Engineer or Project Coordinator to connect with existing service lines on abutting property.

Follow all relevant procedures set forth in the [name of utility company document], current published edition.

K. Regulator Station

Install new gas regulator station at locations shown on the plans or where designated by the Engineer or Project Coordinator.

Construct all piping, valves, and regulator in accordance with the following detail.

L. Raising/Lower Existing Gas Valves

Raise/lower existing gas valves at locations shown on the plans or where approved by the Engineer or Project Coordinator.

Follow all relevant procedures set forth in the [name of utility company document], current published edition.
665.3.06 Quality Acceptance

A. Testing Gas Mains and Service Connections

Follow all relevant procedures set forth in the [name of utility company document], current published edition.

B. Semi-Final Utility Inspection

When the contractor has finished the Gas Distribution System Work, the Contractor may, by written notice, request that a semi-final utility inspection be made. The Engineer, along with the Project Coordinator, will determine if the Gas Distribution System Work is ready for semi-final utility inspection. The Engineer, in agreement with the Project Coordinator, will have the final decision on when the Gas Distribution System Work is complete and thereby ready for semi-final utility inspection. If all the Gas Distribution System Work provided for and contemplated by the Contract is found to be complete to the Engineer’s satisfaction and all documents required in connection with the Gas Distribution System Work has been submitted and accepted then, the Contractor may request transfer of the completed Gas Distribution System Work to [name of utility company].

Once the new facilities are in service and accepted by the Company, provide written correspondence notifying the Engineer and Owner that utility location services will be the responsibility of [name of utility company].

Such partial acceptance shall in no way relieve the Contractor of the responsibility for satisfactory completion of the Contract, or for failure of any portion of the Gas Distribution System Work prior to Final Acceptance of the Project.
Section 665—Gas Distribution System

665.3.07 Contractor Warranty and Maintenance

General Provisions 101 through 150.

665.4 Measurement

Gas mains, service lines, and other items of work in this Specification, complete, in place, and accepted, are measured for payment as follows:

A. Gas Mains

  Gas mains are measured in linear feet (meter) for each size installed. The mains are measured along the center, parallel to the slope of the pipe, from end of each installation through all valves and fittings, and shall include the installation of valves, anodes, test wires, and test stations as dictated by the [name of utility company document], current published edition.

B. Fittings

  Pipe fittings are considered incidental to the gas line in which they are used and are not measured for separate payment.

C. Tie-ins and Valves Installations

  All tie-ins and valve installations associated with tie-ins and regulator stations are not measured for separate payment and shall be included in the per foot price of installed gas main.

D. Service Line Tie-Over

  Service line Tie- Overs are measured by the number of each size, material, and type installed. The types specified will either be short side service tie-over for those that do not require the crossing of a street or roadway; and long side service tie-over when the installation will span a roadway.

E. Service Lines

  Service lines are measured by the number of each size, material, and type installed. The types specified will either be short side service for those that do not require the crossing of a street or roadway; and long side service when the installation will span a roadway.

F. Gas Facilities to be Abandoned or Removed

  The abandonment or removal of all deactivated facilities is not measured for separate payment and shall be included in the per foot price of installed gas main. Abandoned or removal of facilities include: main, valves, service, service risers and regulator stations and pits.

G. Blast/Hammer Rock

  Blast/Hammer Rock is not measured for payment separately.

H. Gas Main and Service Testing

  There is no separate measurement for payment on the testing of gas mains and services, as required by the Company and addressed in the [name of utility company document].
Section 665—Gas Distribution System

I. Steel Casing

Steel Casings are measured per linear foot (meter) for each size of casing installed. Payment is full compensation for furnishing all materials, excavating, backfilling, removing, and replacing pavement, and providing other incidentals necessary to complete the Item.

J. Regulator Station

This will be measured per each for each size of regulator installed.

K. Excavation for Trenches or Directional Boring

Excavation or Directional Boring is not measured for payment separately, but their costs are included in the amount bid for the Item to which it pertains.

L. Incidentals

Backfilling, pavement removed, pavement replaced, and other incidentals are not measured for separate payment.

M. Raise/Lower Gas Valves

This will be measured per each for gas valves raised or lowered.

665.4.01 Limits

General Provisions 101 through 150.

665.5 Payment

The Contract Unit Price for each Item, complete and accepted, will include all costs incidental to the construction of the Item according to the Plans and as specified in this Section.

The Unit Prices bid will include due allowance for the salvage value of all materials removed from existing or temporary lines, and not installed in the completed work. All such surplus items will become the property of the Contractor unless otherwise specified.

Payment for any Item listed below is full compensation for the Item or Items, complete in place. When placing gas mains or service lines in casings, receive separate payment for the cost of furnishing and installing the casings.

A. Gas Mains

Gas Mains will be paid for at the Contract Unit Price per linear foot (meter) for each size of pipe installed. Payment is full compensation for furnishing all materials including fittings, excavating, backfilling, removing, and replacing pavement, testing and sterilizing, and providing other incidentals necessary to complete the Item. Payment will also include the cost of laying pipe in casing when required.

B. Service Line Tie-Over

Service Line Tie-Overs will be paid for at the Contract Unit Price per each for each type (Long Side, or Short Side), size and material installed. Payment is full compensation for excavating, erosion control, backfilling, removing, and replacing pavement, testing and placing fittings, jointing, and connecting to the main, and providing other incidentals necessary to complete the Item. Payment will also include all work referenced in Section 665.3.05.A.6 of this specification and laying pipe in casing when required.
Section 665—Gas Distribution System

C. Service Lines

Service Lines will be paid for at the Contract Unit Price per each for each type (Long Side, or Short Side), size and material installed. Payment is full compensation for excavating, erosion control, backfilling, removing, and replacing pavement, testing and placing fittings, jointing, and connecting to the main, and providing other incidentals necessary to complete the Item. Payment will also include all work referenced in Section 665.3.05.A.6 of this specification and laying pipe in casing when required.

D. Excavation for Trenches or Directional Boring

No separate payment will be made for excavation or directional boring.

E. Blast/Hammer Rock

No separate payment will be made for Blast/Hammer Rock, but its costs are included in the project’s total amount bid for earthwork.

F. Steel Casing

Steel Casings will be paid for at the Contract Unit Price per linear foot (meter) for each size of casing installed. Payment is full compensation for furnishing all materials, excavating, backfilling, removing and replacing pavement, and providing other incidentals necessary to complete the Item.

G. Regulator Station

This will be paid for at the Contract Unit Price per each for each size of regulator installed. Payment is full compensation for furnishing all materials, excavating, backfilling, removing and replacing pavement, and providing other incidentals necessary to complete the Item.

H. Raising/Lowering Gas Valves

This will be paid for at the Contract Unit Price per each for gas valve raised or lowered. Payment is full compensation for furnishing all materials, excavating, backfilling, removing and replacing pavement, and providing other incidentals necessary to complete the Item.

Payment will be made under:

<table>
<thead>
<tr>
<th>Item No. 665</th>
<th>Plastic Gas Main____ in (mm)</th>
<th>Per linear foot (meter)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item No. 665</td>
<td>Steel Gas Main _____ in. (mm)</td>
<td>Per linear foot (meter)</td>
</tr>
<tr>
<td>Item No. 665</td>
<td>Steel Casing____ in (mm)</td>
<td>Per linear foot (meter)</td>
</tr>
<tr>
<td>Item No. 665</td>
<td>Long Side Service ___in (mm),(material)</td>
<td>Per each</td>
</tr>
<tr>
<td>Item No. 665</td>
<td>Short Side Service ___in (mm),(material)</td>
<td>Per each</td>
</tr>
<tr>
<td>Item No. 665</td>
<td>Long Side Service Tie-Over ___in (mm),(material)</td>
<td>Per each</td>
</tr>
<tr>
<td>Item No. 665</td>
<td>Short Side Service Tie-Over ___in (mm),(material)</td>
<td>Per each</td>
</tr>
<tr>
<td>Item No. 665</td>
<td>Regulator Station _____in. (mm)</td>
<td>Per each</td>
</tr>
<tr>
<td>Item No. 665</td>
<td>Raise/Lower Gas Valve</td>
<td>Per each</td>
</tr>
</tbody>
</table>
DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

SPECIAL PROVISION

PROJECT:
COUNTY: Richmond GA and Aiken SC
P.I.: 210327-

Section 670—Water Distribution System

Delete Section 670 and substitute the following:

670.1 General Description

This work consists of furnishing materials, labor, tools, equipment, and other items necessary for installing, removing, abandoning, relocating, and adjusting water distribution systems according to the Plans and Specifications.

670.1.01 Definitions

A. General Provisions 101 through 150

B. The term “The Facility Owner” shall be understood to mean “place utility company name” or “add if more than one company”.

C. The term “Project Manager” shall mean the authorized individual having the authority to give instructions pertaining to the work and to approve or reject the work. The “Project Manager” shall not however be authorized to revoke, alter, enlarge, relax, or release any requirements of the Contract, Plans, and Specifications, nor shall they act as an agent for the Contractor. All Contract items pertaining to the Utility Owner shall be coordinated with the Georgia Department of Transportation’s (GDOT) Project Manager and the Utility Owner.

670.1.02 Related References

A. Standard Specifications

Section 104—Scope of Work
Section 107—Legal Regulations and Responsibility to the Public
Section 108—Prosecution and Progress
Section 205—Roadway Excavation
Section 207—Excavation and Backfill for Minor Structures
Section 670—Water Distribution System

Section 210—Grading Complete
Section 400—Hot Mix Asphaltic Concrete Construction
Section 444—Sawed Joints in Existing Pavements
Section 500—Concrete Structures
Section 600—Controlled Low Strength Flowable Fill
Section 611—Relaying, Reconstructing or Adjusting to Grade of Miscellaneous Roadway Structures
Section 615—Jacking or Boring Pipe
Section 810—Roadway Materials

B. Related Documents
   1. General Provisions 101 through 150.
   2. All products supplied and all work performed shall be in accordance with The Facility Owner’s Standard Specifications, applicable standards from American Society for Testing and Material (ASTM), American Water Works Association (AWWA), American National Standards Institute (ANSI), GDOT Utility Accommodation Policy and Standards, and the Georgia Environmental Protection Division (EPD) Minimum Standards for Public Water Systems. Latest revisions of all standards shall apply.

670.1.03 Submittals

A. General Provisions 101 through 150.

B. Refer to The Facility Owner’s Standard Specifications, current published edition, for water utility submittal requirements. Copies of all submittals and documentation shall be submitted to GDOT, who shall distribute to the Utility Owner.

C. Shop Drawings / Product Data
   1. Submit [6] copies of the following submittals to the GDOT Project Manager:
      a. Product data, including size, dimension, capacity, pressure rating, accessories, and special features, installation instructions, and operating characteristics for all proposed materials to show compliance with the requirements of this Special Provision.
      b. Test reports specified in the Quality Acceptance section of this Special Provision.
      c. Pipe manufacturer certification of compliance with specifications.
      d. Operation and maintenance literature, warranties, and other specified information.

D. Construction Record Documentation
   1. The Contractor shall record on two sets of utility as-built drawings that will record changes and deviations from the Contract Drawings in sizes, lines or grade. Record also the exact final horizontal and vertical locations of underground utilities and appurtenances to an accuracy of +/-0.2 ft, referenced to permanent surface improvements. Drawings shall utilize State Plane Coordinates and shall be legibly marked to record actual construction and submitted to GDOT no later than 30 days after installation and prior to Final Acceptance of the Project. The Utility Owner shall determine if the utility record drawings are complete prior to Final Acceptance of the project.
   2. Record Drawings shall be signed and sealed by a professional engineer or land surveyor registered in the State of Georgia.
   3. Record Drawings shall also be submitted in digital format as indicated in accordance with the Department’s current Electronic Utility File Guidelines.
   4. Except for standard bound materials, bind all 8.5” x 11” (A4) documentation, including 11” x 17” (A3) drawings folded to 8.5” x 11” (A4), in logical groupings in loose-leaf binders of either the 3-ring or plastic slide-ring type. Permanently and appropriately label each such bound grouping of documentation.
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670.1.04 Quality Assurance

A. The Contractor shall comply with applicable codes, ordinances, rules, regulations and laws of local, municipal, state or federal authorities having jurisdiction over the Project.

B. Furnish manufactured items, pipe, fittings, valves, service components, and appurtenances from manufacturers having regularly produced such items as specified herein which have proven satisfactory in actual service, over at least a 2-year period, or as approved by the Utility Owner and GDOT.

C. Regardless of tolerances permitted by industry standards specified herein, the Utility Owner or the GDOT Project Manager may reject pipe or appurtenances at the manufacturing plant or project site which have cracks, chips, blisters, rough interior or exterior surface, evidence of structural weakness, joint defects, or other imperfections that might in the opinion of the Project Manager contribute to reduced functional capability, accelerated deterioration or reduced structural strength.

D. The Utility Owner and the Utility Owner’s consultant shall have the right to visit and inspect the work at any time. The Utility Owner may also have an Inspector assigned to the project authorized to inspect portions or all of the utility work done and the preparation, fabrication, or manufacture of the materials to be used. The Utility Owner shall be able to advise GDOT Project Manager of any observed discrepancies or potential problems. The cost of these inspections shall be the responsibility of the Utility Owner.

E. GDOT shall notify the Utility Owner before authorizing any changes or deviations which might affect the Utility Owner’s facilities. Contractor shall notify GDOT and Utility Owner a minimum of 24 hours prior to beginning work on utilities.

F. The Utility Owner shall be notified by GDOT Project Manager when all utility work is complete and ready for final inspection. The Utility Owner shall be invited to attend the final inspection and may provide a corrections list to GDOT Project Manager prior to the final inspection.

G. The Contractor shall verify the actual location and depth of all utilities prior to construction. All utilities and structures shall be protected during construction. Any damaged facilities shall be repaired or replaced at the Contractor’s expense.

670.2 Materials

All materials provided shall be in conformance with the requirements and standards set forth in The Facility Owner’s Standard Specifications, current published edition. All pipeline and appurtenance materials in contact with potable water shall be National Sanitation Foundation (NSF) 61 Certified and part of GDOT QPL list.

Pipes and appurtenances shall comply with Section 1417(a)(1) of the Safe Water Drinking Act as amended in 2011 which prohibits the use of any pipe, any pipe or plumbing fitting or fixture, and solder, or any flux, after June 1986, in the installation or repair of (i) any public water system; or (ii) any plumbing in a residential or non-residential facility providing water for human consumption, that is not lead free as defined in Section 1417(d).

670.2.01 Water Piping systems and Appurtenances

A. Ductile Iron Pipe and Fittings

1. Ductile iron pipe shall meet the latest edition of ANSI/AWWA C150/A 21.50 and C151/A 21.51 for the class and joint specified with a nominal laying length of 18 (5.5 m) to 20 feet (6 m). Joints for buried ductile iron pipe shall be mechanical or push-on joints. Unless specified otherwise in The Facility Owner’s Standard Specifications, ductile iron pipe diameters 12 inch (300 mm) or less shall be minimum Pressure Class 350, while pipe diameters greater than 12 inch (300 mm) shall be minimum Pressure Class 250.

2. Ductile iron pipe for the interior of structures and above ground installations shall be flanged. Flanges shall be ductile iron and shall be threaded-on flanges conforming to ANSI/AWWA C115/A21.15 or cast-on flanges conforming to ANSI/AWWA C110/A21.10. The minimum class thickness for ductile iron flanged pipe to be threaded is Class 53.

3. Interior surfaces of ductile iron pipe and fittings shall be cement mortar lined in accordance with AWWA C104.
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4. Ductile iron shall have an exterior coating as specified in AWWA C151 for ductile iron pipe and AWWA C153/C110 for ductile iron fittings.

5. Buried ductile iron pipe and fittings shall be polyethylene encased at locations indicated on the Plans or as conditions warrant. Polyethylene encasement tubing shall be in accordance with ANSI/AWWA C105/A21.5 and ASTM A674 and shall have a minimum thickness of 8 mils. Polyethylene encasement tubing shall be blue in color to designate potable water.

6. Fittings: Ductile iron fittings shall be epoxy coated and meet the requirements of ANSI/AWWA C153/A21.53 or ANSI/AWWA C110 A21.10 with a minimum pressure rating of 250 psi. Ends shall be restrained mechanical joint. All ductile iron fittings shall bear the NSF approval seal for potable water pipe.

7. Mechanical Joint Fittings: Mechanical joints consisting of bell, socket, gland, gasket, bolts, and nuts shall conform to ANSI/AWWA C111/A21.11.

8. Push-On Joints: Push-on joints shall be designed in accordance with ANSI/AWWA C111/A21.11. Joint lubrication shall be as furnished by the manufacturer.

9. Rubber gasket joints for push-on or mechanical joints shall conform to the requirements of ANSI/AWWA C111/A21.11.

10. Restrained Joints: Restrained joints shall be provided as shown on the Plans and where required for thrust restraint. Restrained joints shall not require field welding or grooves cut into the pipe barrel for restraint. The restraining joints for mechanical joint fittings shall conform to the requirements of ANSI/AWWA C111/A21.11 with assembly in conformance with AWWA C600 and manufacturer’s recommendations. Restrained joints for pipe shall be mechanical joints with ductile iron retainer or push-on type joints and shall have a minimum rated working pressure of 250 psi.

11. Mechanical joint retainer glands may be used to restrain mechanical joint pipe and fittings to the plain end of ductile iron pipe and fittings. Restrainer glands shall be manufactured of ductile iron per ASTM A536.

12. Corrosion-resistant bolts used with ductile iron joints shall be high-strength, low-alloy steel as specified in ANSI/AWWA C111/A21.11.

13. Welded Outlets: Welded outlets in ductile iron pipe shall be provided where specified and indicated on the Plans. Outlets shall be fabricated by welding sections of ductile iron pipe manufactured in accordance with ANSI/AWWA C151/A21.51. Welded outlet pipe shall be fabricated only by the pipe manufacturer. The minimum ductile iron pipe thickness for fabrication of welded outlet pipe shall be Thickness Class 53 for 4-inch to 54-inch (100 to 1350 mm) diameter pipe. All joints on welded-on branch outlets shall be provided in accordance with the latest revision of ANSI/AWWA C111/A21.11 and/or ANSI/AWWA C115/A21.15, as applicable. After the outlets are welded together and prior to finishing, the assembly shall be subjected to a 15 psi air test for leakage. The maximum size and laying length of the welded-on branch outlet shall be recommended by the pipe manufacturer and acceptable to the Utility Owner for the field conditions and connecting pipe or valve.

B. Polyvinyl Chloride (PVC) Pipe

1. PVC pipe diameters 4-inch through 12-inch (100 mm to 300 mm) shall meet ANSI/AWWA C900 requirements, and shall be a minimum pipe dimension ratio (DR) 18, Pressure Class 235 psi. PVC pipe diameters 14-inch (350 mm) and greater shall meet ANSI/AWWA C905 requirements, shall be DR 18 minimum, Pressure Class 235 psi. Pipe shall have a bell with an integral wall section with a factory installed, solid cross section elastomeric ring in accordance with ASTM F477.

2. All PVC pipe shall be formulated for sunlight exposure, be blue in color to designate potable water, and bear the NSF approval seal.

3. Joints for 4-inch (100 mm) and larger PVC pipe shall meet the requirements of AWWA C900/C905, latest edition. The rubber gaskets used for the joints shall consist of flexible elastomeric material conforming to ASTM F477.
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4. PVC pipe shall have the same outside diameter (OD) as ductile iron pipe and be compatible for use with ductile iron fittings.

5. Fittings for PVC pipe 4 inches (100 mm) and larger shall be ductile iron mechanical joint and comply with the requirements set forth in the specifications for Ductile Iron Pipe and Fittings.

6. Restrained Joints: Restrained joints shall be provided as shown on the Plans and where required for thrust restraint. Restrained joints shall comply with the requirements set forth in the specifications for Ductile Iron Pipe and Fittings.

7. Unless specified otherwise in the Plans or The Facility Owner’s Standard Specifications, 2-inch (50 mm) and 3-inch (75 mm) diameter PVC pipe shall conform to the requirements of ASTM D2241 Class 1120 or 1220 (SDR 21) with a working pressure rating of 200 psi with integral bell gasketed joints. Pipe is to be manufactured to IPS standard pipe equivalent outside diameters.

8. Schedule 80 PVC pipes smaller than 4-inch (100 mm) nominal diameter shall be in accordance with ASTM D1785. Schedule 80 pipe shall have threaded joints. Solvent cemented joints are not allowed for buried pipes. Threaded type fittings for Schedule 80 PVC pipe shall be in conformance with ASTM D2464. All threaded joints shall be watertight.

9. Flanges for Schedule 80 PVC pipe shall be rated for a 150 psi working pressure with ANSI B16.1 dimensions and bolting pattern. Flanges shall be connected to PVC piping with threaded joints in accordance with ASTM D2467 or ASTM 2464, respectively.

C. Fusible PVC Pipe

1. Fusible PVC pipe sizes 4-inch (100 mm) to 36-inch (900 mm) shall conform to AWWA C900/C905 as applicable and follow the dimension ratios (DR) set forth in the requirements listed for PVC pipe.

2. Fusible PVC pipe shall be blue in color to designate potable water.

3. Fusible PVC pipe shall be extruded with plain ends. The ends shall be square to the pipe and free of any bevel or chamfer. There shall be no bell or gasket of any kind incorporated into the pipe.

4. Fusible PVC pipe shall be manufactured in a standard 40-foot nominal length, or custom lengths as specified.

5. Joints shall be made by butt fusing sections of pipe with manufacturer-approved equipment.

6. Fittings shall be ductile iron mechanical joint and comply with the requirements set forth in the specifications for Ductile Iron Pipe and Fittings.

D. High Density Polyethylene (HDPE) Pipe

1. HDPE pipe sizes 4-inch (100 mm) and larger shall be a PE 4710/3408 high density, extra-high molecular weight polyethylene manufactured from first-quality high density polyethylene resin containing no additives, fillers, or extenders. The HDPE pipe shall have an ASTM D3350 cell classification of PE 445574C, shall meet the requirements of AWWA C906, and shall be sized based upon the ductile iron pipe size (DISP), outside diameter (OD) sizing system. The HDPE pipe shall be a minimum DR 11, pressure class 160 psi, and shall bear the NSF approval seal.

2. HDPE pipe shall be blue or marked with a permanent blue stripe to designate potable water.

3. Joints shall be made by butt fusing sections of pipe with manufacturer-approved equipment.

4. Fittings shall be ductile iron mechanical joint meeting the requirements of ANSI/AWWA C110/A 21.10 and ANSI/AWWA C111/A21.11.

5. The pipe shall have fusion welded restrainer ring, follower gland, and a 12-inch (300 mm) stainless steel insert for the mechanical joint connection.

6. HDPE water mains shall be properly sized utilizing the inside diameter of the nominal pipe diameter. If during construction HDPE is substituted for other pipe materials, the Contractor shall verify that the inside diameter of the HDPE is the same or larger than the inside diameter of the pipe originally specified.
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E. Steel Casing Pipe

1. All materials, design, fabrication, handling, and testing of steel casing pipe shall conform to the requirements of ASTM A139, AWWA C200 and AWWA Manual M11 “Steel Pipe – A Guide for Design and Installation.”

2. Steel casing pipe shall be new, smooth-wall, carbon steel pipe conforming to ASTM Specification A139, Grade B with a minimum yield strength of 35,000 psi. Steel casings shall be used with the size, minimum thickness, length, and coating specified on the Plans or The Facility Owner’s Standard Specifications.

3. Additional anti-corrosion measures, as specified by the manufacturer or indicated on the Plans, shall be provided at connectors, couplings, rollers, restraints, etc.

4. Unless specified otherwise in the Plans or The Facility Owner’s Standard Specifications, casing pipe end seals shall consist of 1/8-inch (6 mm) thick flexible synthetic rubber boot with adjustable stainless steel banding straps. The annular space of the casing shall not be filled with concrete or grout.

5. Casing spacers shall consist of a stainless steel shell, PVC ribbed liner, and non-conducting separators to keep the carrier pipe from touching the casing pipe. Spacers shall be provided at a maximum of 10-foot intervals and within 2 feet (0.6 m) of the end of the casing pipe.

F. Pipe Detection Wire

1. Unless otherwise specified by the Plans or The Facility Owner’s Standard Specifications, open cut installations of non-metallic pipe shall include minimum #12 gauge tracing wire. Pipe installed by directional drill shall include two (2) insulated 8 gauge tracer wire. Wire shall be solid copper insulated with HDPE installed along pipe, wrapped around service line stub outs and stubbed into valve boxes for locating purposes. Wire shall be properly spliced to provide continuous conductivity.

G. Warning Tape

1. Water mains shall be installed with polyethylene film warning tape manufactured for marking and identifying underground water utilities. Tape shall be a minimum of 2 inches (50 mm) wide and 4 mils thick, blue in color, with continuously printed letters reading “CAUTION BURIED WATER LINE BELOW”.

H. Gate Valves

1. Gate valves 3 inches (80 mm) and larger shall be of the resilient seat type meeting the requirements of AWWA C509 or C515. Valves shall be iron body, bronze trimmed, with non-rising stems, and shall be fusion-bonded epoxy coated per ANSI/AWWA C550. Valves shall have a minimum design working pressure of 200 psi.

2. Valves shall be manually operated by nut and open counter-clockwise unless specified otherwise in the Plans or The Facility Owner’s Standard Specifications.

3. The resilient seating arrangement shall provide zero leakage at the design working pressure when installed with line flow in either direction. All ferrous surfaces inside and outside shall have a fusion bonded epoxy coating. All valves shall be provided with O-ring seals. The design and machining of valves shall be such as to permit replacing the O-ring seals in the valves while in service without leakage.

4. All gate valves, when fully opened, shall have an unobstructed waterway diameter equal to or larger than the full nominal diameter of the valve.

5. In general, valves shall be designed for vertical installation. Valves installed in the horizontal position shall be provided with bevel gears, extended gear case, rollers, tracks, and scrapers.

6. Exposed or above-ground gate valves shall be outside screw and yoke (OS&Y) flanged joint type with an operating hand wheel. The face-to-face dimensions and drilling shall conform to ANSI B16.10 for Class 125 flanged joint end gate valves.

7. Valves shall include mechanical joints, bolts, glands, gaskets, and all other materials necessary to join to existing work.
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8. Provide brass identification tag imprinted with “WATER”, valve size, valve type, and direction and number of turns to open. Provide a ¼-inch (8 mm) hole in the brass tag and attach the tag to the end of the locate wire (twist wire around tag). Tag shall be 2-inch (50 mm) diameter and ¼-inch (6 mm) thick brass with a ¼-inch (8 mm) hole.

I. Insertion Valve

1. Insertion type valves shall be resilient wedge gate valves designed to be installed into an existing pressurized potable water main without interruption of flow through the pipe and no reduction of line pressure.
   a. Valve shall be fusion-bonded epoxy coated in compliance with AWWA C550.
   b. The construction of the resilient wedge shall comply with AWWA C509 requirements.
   c. The resilient wedge shall be fully encapsulated with EPDM rubber and shall seat on the valve body and not the pipe. The resilient wedge shall be totally independent of the carrier pipe.
   d. Valve shall be restrained to the pipe.
   e. Valves shall be suitable for operating pressures up to 250 psi.

J. Butterfly Valves

1. Butterfly valves shall be of the tight-closing, rubber seated type, with rubber seat positively locking in place sealing against flow from either direction. Valves shall be hand operated with cast or ductile iron bodies. Valves shall conform to the requirements of AWWA C504, Class 150B, and shall be fusion-bonded epoxy coated per ANSI/AWWA C550.
2. Valves shall have a 2-inch (50 mm) square operating nut and shall be installed with extension stems to extend the operating nut in accordance with the project details. Valves shall open by turning the operating nut counter clockwise unless specified otherwise in the Plans or The Facility Owner’s Standard Specifications.
3. Valve shafts shall be of 304 or 316 stainless steel.
4. Buried butterfly valve end connections shall be installed using restrained mechanical joints.
5. Flanged valves shall be fully faced and drilled in accordance with ANSI Standard B16.1, Class 125.
6. Provide brass identification tag imprinted with “WATER”, valve size, valve type, and direction and number of turns to open. Provide a ¼-inch (8 mm) hole in the brass tag and attach the tag to the end of the locate wire (twist wire around tag). Tag shall be 2-inch (50 mm) diameter and ¼-inch (6 mm) thick brass with a ¼-inch (8 mm) hole.

K. Ball Valves

1. Ball valves 2-inch (50 mm) and smaller shall be designed for a working pressure of not less than 175 psi. End connection shall be threaded. The body and all parts shall be made in accordance with AWWA C800 and ASTM B62 latest revision.

L. Tapping Sleeves and Valve Assembly

1. Tapping sleeves and valves sizes 4-inches (100 mm) and larger shall be stainless steel with wraparound gasket style, or ductile iron of the split-sleeve, mechanical joint type. Tapping sleeves shall be rated for a minimum 150 psi working pressure in accordance with ANSI/AWWA C110/A21.10.
2. When tapping an existing asbestos cement pipe, a stainless steel tapping sleeve which contains a full gasketed surface within the sleeve body shall be used due to variances in the manufactured outside diameter of the asbestos cement pipe.
3. Tapping sleeve shall have an outlet flange per ANSI B16.1, Class 125 standard.
4. The Contractor shall determine the outside diameter of the existing main before ordering the sleeve.
5. Tapping valves shall be mechanical joint outlet, non-rising stem, resilient seated gate valves meeting the applicable requirements of ANSI/AWWA C509/C515 and C550 with a minimum design working pressure of 200 psi.
6. Tapping valves shall be specifically designed for pressure tapping with sufficient seat opening to allow full diameter taps to be made.
7. Tapping valves shall be manufactured with an integral tapping flange having a raised lip design.
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8. Tapping valves shall be furnished with a combination flange and mechanical joint for connecting the branch to the main.

M. Valve Boxes

1. All valves shall be equipped with valve boxes. The valve boxes shall be heavy, roadway type boxes. The valve box cover shall be marked “WATER VALVE” or “WATER”.


3. The valve boxes shall be adjustable up or down from the nominal required cover over the pipe. Extensions shall be provided as necessary. A precast concrete ring shall be placed around the valve box opening when outside of paved areas.

4. Valves shall be furnished with extension stems as necessary to bring the operating nut to within 24 inches (600 mm) minimum of the top of the valve box.

N. Service Connection Assemblies

1. Water service connections and plumbing should conform to the standards set forth in The Facility Owner’s Standard Specifications and relevant local and/or state plumbing codes or to the Standard Plumbing Code as applicable within the jurisdiction in which the system is located.

2. Service connection assemblies shall be provided for all new service line connections to existing meters. Existing service lines indicated for replacement shall be replaced with new materials from the water main to the existing or new water meter.

3. Service connection assemblies shall include:
   a. Service saddle
   b. Corporation stop
   c. Service line
   d. Fittings
   e. Curb stop
   f. Water meter box
   g. Water meter (separate Pay Item for new service connections)
   h. Backflow preventer (separate Pay Item for new service connections)

O. Service Saddles

1. Service saddles shall have ductile iron or bronze body with stainless steel epoxy coated double tie straps and nuts with pressure rating not less than that of the pipe to which it is to be connected.

2. Saddles shall have a rubber gasket cemented to the body, with compatible threading between the saddle and corporation stop. Saddles shall conform to ANSI/AWWA C800 standards.

3. The service saddle shall provide full support around the circumference of the pipe, providing a bearing area of sufficient width so that pipe will not distort when the saddle is tightened.

P. Water Service Pipe

1. Polyethylene (PE) pipe for water service lines shall conform to AWWA C901 and ASTM D-2737 and shall be 200 psi pipe, SDR 9 for copper tube size (CTS). Polyethylene extrusion compound from which the polyethylene pipe is extruded shall comply with applicable requirements for PE3408 ultra-high molecular weight polyethylene plastic material as specified in AWWA C901.

2. Marking on the PE service pipe shall include the nominal pipe or tubing size, the type of plastic material, the standard thermoplastic pipe dimension ratio or the pressure rating in psi, the ASTM designation with which the pipe complies, and manufacturer's name or trade mark and code. It shall also include the NSF seal of approval for use with potable water.
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3. Copper tubing for water service lines shall be seamless and shall conform to ANSI/AWWA C800 and ASTM B88, Type K soft, suitable for potable water use with a working pressure of 150 psi.

4. Water service line fittings shall be as indicated in The Facility Owner’s Standard Specifications.

Q. Corporation and Curb Stops

1. Corporation stops, curb stops, and other appurtenances for plastic or copper service lines shall meet the requirements of ASTM B62 and AWWA C800.

2. Service line taps shall be equipped with corporation stops. Corporation stops in sizes 1-inch (25 mm) through 2-inch (50 mm) shall be manufactured from cast bronze with machined fitting surfaces. The corporation shall be pressure rated to no less than 150 psi.

3. Curb stops shall be ball valve type and made of bronze. Pipe connections shall be suitable for the type of service pipe used and shall be pressure rated for no less than 150 psi.

R. Water Meters

1. Water meters shall conform to the requirements and standards set forth in The Facility Owner’s Standard Specifications.

S. Meter Boxes

1. Water meter boxes shall be high density reinforced plastic body with one piece cast iron lid with lettering “WATER METER” on cover unless otherwise indicated on the Plans. Recessed hole shall be included in lid, if required by Utility Owner for electronic reading capability. Provide box of size and height appropriate to installation of meter and accessories required. Meter and curb stop shall be fully encased by the meter box.

T. Concrete Vault

1. Concrete vaults shall conform to the requirements and standards set forth in The Facility Owner’s Standard Specifications and standard details.

U. Air Release Valve Assembly

1. Air release, air/vacuum valves, and combination air valves shall be suitable for use with potable water systems and manufactured in compliance with ANSI/AWWA C512.

2. Air release valves shall have a small venting orifice to vent the accumulation of air and other gases in the line or system under pressure.

3. Air/vacuum valves shall have a large venting orifice to permit the release of air as the line is filling or relieve the vacuum as the line is draining or is under negative pressure.

4. Combination air valves shall have operating features of both the air/vacuum valve and air release valve.

5. Valves shall be suitable for pressures up to 250 psi.

6. Air release, air/vacuum valves, and combination air valves shall conform to the requirements set forth in The Facility Owner’s Standard Specifications and standard details.

V. Fire Hydrant Assembly

1. Fire hydrants shall be the compressive, post style, dry barrel type, and shall conform to the requirements of ANSI/AWWA C502 and local code requirements. The valve opening shall not be less than 4½-inch (115 mm). All hydrants shall be complete including joint assemblies.

2. Hydrants shall be suitable for working pressure of 150 psi and shall be hydrostatically factory tested to 300 psi.

3. All working parts, including the seat ring, shall be removable through the top without excavating or disturbing the barrel of the hydrant.

4. Hydrants shall be constructed with a lubricant chamber which encloses the operating threads and which provides automatic lubrication of the threads and bearing surfaces each time the hydrant is operated. This assembly shall be
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comprised of a top O-ring serving as a dirt and moisture barrier and a lower O-ring which will serve as a pressure seal.

5. Hydrants shall include two 2½-inch (65 mm) hose nozzles and one 4½-inch (115 mm) pumper connection with National Standard Fire Hose Threads unless specified otherwise in the Plans or The Facility Owner’s Standard Specifications. Hydrant threads shall comply with the specifications of the local agency providing fire service.

6. Hydrant nozzle shall be constructed to face in any direction at any time by removing the safety flange bolts and revolving the head without digging or shutting off water.

7. Hydrants shall have pentagon operating nut measuring 1½-inch (40 mm) point to flat and shall open by turning counter-clockwise.

8. Hydrant shall have a safety-type vertical barrel with a minimum 3½-foot bury and be designed with safety flange and/or bolts to protect the barrel and stem from damage, eliminate flooding, and allow rapid replacement if hydrant is struck. All risers necessary for deeper bury applications shall be provided by the hydrant manufacturer.

9. Hydrants shall include positive, automatic drain valves which shall be fully closed when the main valve is open.

10. Bottominlet of hydrant shall be provided with mechanical joint connection complete with accessories as specified and shall be 6-inch (150 mm) nominal diameter.

11. Fire hydrant shall be painted above ground with rust inhibiting enamel paint in accordance with The Facility Owners Standard Specifications.

12. Hydrant assemblies shall be restrained from the hydrant to the tee at the main.

W. Backflow Prevention Devices

1. Backflow prevention devices shall be installed where indicated on the Plans and shall meet all applicable AWWA, State, and local code/ordinance requirements.

2. Backflow preventer materials shall conform to the requirements and standards set forth in The Facility Owner’s Standard Specifications.

X. Thrust Collars and Thrust Blocks

1. Concrete used for thrust collars or thrust blocks shall meet the “Class A” requirements for concrete listed in Section 500.

2. Thrust collars shall include welded-on collars attached by the pipe manufacturer or retainer glands. Concrete shall be poured continuous around the pipe and bear against undisturbed earth.

3. Reinforcing steel shall meet the requirements set forth in the Plans or The Facility Owner’s Standard Specification].

4. Mechanical joint restraints shall be utilized in lieu of thrust blocks with the approval of Utility Owner.

Y. Manholes

1. Precast reinforced manholes shall be manufactured in accordance with ASTM C478 and shall have a minimum wall thickness of 5 inches (127 mm). All concrete shall have a minimum compressive strength of 4,000 psi when tested in accordance with ASTM C478.

2. Joints between precast sections shall be sealed by means of rubber O-ring gaskets or flexible butyl rubber sealant.

3. Non-shrinking grout or a flexible seal shall be used to seal the pipe penetrations and prevent water from entering the manhole.

4. Manhole rings and cover shall be per The Facility Owner’s Standard Specifications and standard details.

670.2.02 Delivery, Storage, and Handling

A. Handle pipe, fittings, valves, and accessories carefully to prevent damage. Handle pipe by rolling on skids, forklift, or front end loader. Do not use material damaged in handling. Slings, hooks, or pipe tongs shall be padded and used in such a manner as to prevent damage to the exterior coatings or internal lining of the pipe. Do not use chains in handling pipe, fittings, or appurtenances.
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B. To unload pipe, carefully lift and lower it into position using approved padded slings, hooks, or clamps. Furnish equipment and facilities for unloading, handling, distributing, and storing pipe, fittings, valves, and accessories. Make equipment available at all times for use in unloading. Do not roll, drop or dump materials. Any materials dropped or dumped shall be subject to rejection without additional justification.

C. Stored materials including salvaged materials shall be kept in suitable areas safe from damage. The interior of all pipe, fittings, and other appurtenances shall be kept free from dirt or foreign matter at all times. Store and support plastic pipe to prevent sagging and bending. Store plastic pipe and gaskets to prevent exposure to direct sunlight. Valves and hydrants shall be stored and protected from damage by freezing.

D. Pipe shall not be stacked higher than the limits recommended by the manufacturer. The bottom tier shall be kept off the ground on timbers, rails, or concrete.

670.3 Construction Requirements

670.3.01 Personnel
A. General Provisions 101 through 150.
B. Construction and installation of all water utilities shall be performed by a Contractor prequalified/registered with GDOT.
C. All work specified in this section, except for water system service line installation shall be performed by a Contractor with a valid Utility Contractor's license issued by the State of Georgia. Water service line installation shall be performed by either a Utility Contractor licensed in the State of Georgia or by a Master Plumber licensed in the State of Georgia.

670.3.02 Equipment
A. Ensure all equipment used is in conformance with the requirements and standards set forth in The Facility Owner’s Standard Specifications, current published edition.

670.3.03 Preparation
General Provisions 101 through 150.

670.3.04 Fabrication
General Provisions 101 through 150.

670.3.05 Construction

A. Finding Existing Underground Utilities and Obstructions
   2. According to the best information available to GDOT, all known water lines, sewer lines, gas lines, telephone conduits, drainage structures, etc. are shown on the Plans. However, to find such installations, use an electronic pipe and cable finder in locating existing installations or obstructions to the work.
   3. When unforeseen conflicts require Plan changes, perform the work as altered according to Subsection 104.03 and Subsection 104.04.
   4. Follow all Utility Owner customer notification requirements and obtain approval from the Utility Owner and GDOT Project Manager prior to disrupting any existing water services as required to install the water facilities shown on the Plans.

B. Jack and Bore
Comply with Section 615 for water main installations by jack and bore.

C. Directional Drilling
   1. Install water mains and services by means of directional drilling at locations shown on the Plans or where approved by GDOT or Utility Owner. Provide submittals and follow all relevant procedures and requirements set forth in The Facility Owner’s Standard Specifications.
   2. The Contractor shall not initiate horizontal directional drilling until all submittals are received, reviewed, and accepted by GDOT and the Utility Owner, and all required permits are obtained.
3. The Contractor shall select drilling additives and fluid mixture proportions to ensure continuous circulation, bore stability, reduce drag on the pipe, and completely fill the annular space between the bore and the pipe to ensure stability and control settlement.

4. The Contractor shall submit contingency plans for remediation of potential problems that may be encountered during the drilling operations. The contingency plans shall address the observations that would lead to the discovery of the problem and the methods that would be used to mitigate the problem. Potential problems that shall be addressed include:
   a. Loss of returns/loss of circulation of drilling fluid.
   b. Encountering obstruction during pilot bore or reaming/pullback.
   c. Drill pipe or product pipe cannot be advanced.
   d. Deviations from design line and grade exceed allowable tolerances.
   e. Drill pipe or product pipe broken off in borehole.
   f. Product pipe collapse or excessive deformation occurs.
   g. Utility strike.
   h. Hydrolock occurs or is suspected.
   i. Excessive ground settlement or heave of ground surface or existing utilities.
   j. Adverse returns / hydrofracture or surface spills resulting in drilling fluids entering water or reaching the surface.

5. Pipe damaged in directional drilling operations shall be removed and replaced at no additional expense to GDOT or the Utility Owner.

6. Voids developed or encountered during the installation operation shall be pressure grouted with a grout mix approved by GDOT.

7. Installation shall include a locatable conduit system, with identification markers on each side of GDOT right-of-way where applicable. Two (2) insulated 8 gauge solid copper tracers wire shall be attached to the leading end of the pipe pulling head and shall extend the full length of the installed pipe.

8. The location and alignment of the pilot drill progress shall be continuously monitored for compliance with the proposed installation alignment and for verification of the depth of the bore. Monitoring shall be accomplished by computer generated bore logs which map the bore path based on x, y, z coordinate information provided by the locating/ tracking system. Readings or plots shall be obtained on every drill rod, and shall be provided to the Inspector on a daily basis. Deviations between the recorded and design bore path shall be calculated and reported on the daily log. If the deviations exceed tolerances specified elsewhere, such occurrences shall be reported immediately to GDOT. The Contractor shall undertake all necessary measures to correct deviations and return to design line and grade.

9. Upon completion of the directional drill the Contractor shall furnish GDOT and the Utility Owner an as-built drawing along with a report of the monitoring of the drilling fluids during the pilot hole and backreamed hole.

10. Drilling fluid pressures, flow rates, viscosity, and density shall be monitored and recorded by the Contractor. The pressures shall be monitored at the pump. These measurements shall be included in daily logs submitted to GDOT. The Contractor shall document modifications to the drilling fluids, by noting the types and quantities of drilling fluid additives and the dates and times when introduced. The reason for the addition of drilling fluid additives or other modifications shall be documented and reported.

11. Management and disposal of drilling fluids shall be the Contractor’s responsibility. Excess drilling fluids shall be contained at the entry and exit points until recycled or removed from the site. All drilling fluids shall be disposed of in a manner acceptable to the appropriate local, state and federal regulations. The Contractor’s work will be immediately suspended by GDOT whenever drilling fluids seep to the surface other than in the boring entrance or exit pit, or when a paved surface is displaced.
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12. Surfaces damaged by the work shall be restored to their preconstruction conditions at no additional cost to GDOT or Utility Owner, and with no increase in contract time.

13. The following items shall be as shown on the Plans, unless otherwise approved in writing by GDOT:
   a. Entry / exit points
   b. Drill entry / exit angles
   c. Pilot bore path
      1) Radius of Curvature
      2) Entry / exit tolerances: Contractor shall be solely responsible for all work necessary to correct excessive deviations from line and grade, including re-drilling, redesigning connections, and acquiring additional easement, at no additional cost to GDOT or Utility Owner and without schedule extension.

14. The pilot bore shall be pre-reamed and reamed using equipment and methods submitted by the Contractor. The Contractor shall completely ream the bore to the final diameter prior to pullback.

15. Pullback: The pipe shall be installed by pulling it into the reamed bore path in a continuous operation, behind a final reaming tool selected by the Contractor. The pipe shall be isolated from excessive torsional and axial stresses by a swivel device with a pre-established breakaway tensile capacity that is lower than the allowable tensile strength of the pipe. The maximum pull (axial tension force) exerted on the pipelines shall be measured continuously and limited to the maximum allowed by the pipe manufacturer with an appropriate factor of safety so that the pipe or joints are not overstressed. The end of the pipe shall be closed during the pullback operation.

16. Pipelines shall be adequately supported during installation so as to prevent overstressing or buckling. The Contractor shall provide adequate support/rollers along the pipe layout area to support the required length of pipe for the bore. The pipe layout area shall be cleared of all large stones, construction debris, or other foreign objects that could damage the pipe during pullback. The Contractor shall monitor and inspect pipe rollers and method for suspending pipe at entry during the pullback operation to avoid damage to the pipe.

17. The end of the pipe shall be closed during the pullback operation.

18. Each length of pipe shall be inspected and cleaned as necessary to be free of debris immediately before joining.

19. The Contractor shall at all times handle the pipe in a manner that does not over-stress or otherwise damage the pipe. Vertical and horizontal curves shall be limited so that wall stresses do not exceed 50% of yield stress for flexural bending of the pipe. If the pipe is buckled or otherwise damaged, the damaged section shall be removed and replaced by the Contractor at his expense. The Contractor shall take appropriate steps during pullback to ensure that the pipe and tracer wires will be installed without damage.

20. If necessary, the pipe shall have water added as it enters the bore to achieve neutral buoyancy and reduce pullback loads and to ensure that adequate internal pressure is maintained at all points to counterbalance collapse pressures.

21. The Contractor shall cease pullback operations if the pipe is damaged and shall remove the pipe from the bore and repair the pipe using the manufacturer’s recommended procedure or replace the damaged pipe before resuming installation.

22. Damage to the pipe resulting from manufacturer defects, installation, or grouting is the responsibility of the Contractor, including costs for replacement and labor and materials. To confirm no damage to the pipe, upon completion of pullback, the Contractor shall pull a sphere or pig through the entire length of the pipeline. The pig shall be one inch less in diameter than the internal diameter of the product pipe, capable of allowing water to pass through it, complete with a pulling cable on either side. If the pig or sphere cannot pass through the pipe, it shall be considered collapsed and damaged.

23. After the carrier pipe is completely pulled through the bore, a sufficient relaxation period as recommended by the pipe manufacturer shall be provided before the final pipe tie-in.

24. The Contractor shall conduct a final hydrostatic test of the installed pipeline. Final test shall be in accordance with these specifications. The Contractor shall repair any defects discovered during this test, and repeat until the pipe passes the test.
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D. Excavating Trenches

1. The Contractor shall provide all necessary shoring and bracing materials as required to assure safe working conditions and to protect the excavations. The Contractor shall be required to fully comply with all applicable OSHA Excavation Safety Standards. No separate payment shall be made for any special procedure used in connection with the excavation.

2. Excavate trenches to the proper depth and width as follows:
   a. Trench to Grade: Excavated trench bottoms shall be firm, free from boulders, and conform to the established grade. Limit open trench excavation to a maximum of three 300 feet (90 m) ahead of completed backfill.
   b. Care shall be taken not to over excavate except where necessary to remove unstable material, irregularities, lumps, rock, and projections. Unnecessary over excavation shall be replaced at the Contractor's sole expense and in accordance with Subsection 670.3.05.
   c. Excavation carried below the established grade lines shown or established by the Utility Owner shall be backfilled according to Section 207 and Subsection 670.3.05. Use Class I or Class II Soils (defined in Section 810) and firmly compact the soil.
   d. Where the established grade of a trench is in rock, undercut the bottom of the trench by at least 6 inches (150 mm) beneath the pipe or conduit and the greater of 24 inches (600 mm) wider than the pipe/conduit (12 inches or 300 mm each side) or 42 inches (1050 mm) wide, then backfill and compact according to Subsection 670.3.05.
   e. Excavation in pavement and pavement patching shall be according to GA Standard No. 1401. Remove the pavement according to Section 444, except no separate payment shall be made for sawed joints.
   f. Dewatering: Remove all water from excavations and maintain the excavations free of water while construction therein is in progress. Provide dewatering equipment as necessary to conform to this requirement. Dewatering procedures must meet all state and local regulatory requirements.

3. Minimum Trench Depth
   a. Excavate trenches to provide at least 48 inches (1.2 m) cover depth directly above the pipe to the finished pavement surface, sidewalk, grass, etc. unless indicated otherwise on the Plans or by the Utility Owner and GDOT Project Manager. In order to avoid existing utilities, it may be necessary for the pipe to be laid shallower or deeper than the minimum cover specified. At such time the Contractor shall not be allowed extra compensation for additional excavation necessary for deeper installations.
   b. Side slopes of the trenches shall be as nearly vertical as practicable. Trenches in excess of 5 feet (1.5 m) deep shall either have the trench sides laid back to conform to OSHA requirements for trench safety, if such area is available within the limits of excavation, or, alternatively, trenches deeper than 5 feet (1.5 m) shall be excavated via trench box or shored and braced.
   c. If any part of a water main is to be placed in or under a new embankment, finish the embankment to at least a 2-foot plane above the outermost portion of the pipe barrel before excavating the trench.

4. Trench Width: Excavate trenches to uniform widths wide enough to allow proper installation of pipe, fittings, and other materials, a minimum of 6 inches (150 mm) and a maximum of 12 inches (300 mm) each side of the pipe or conduit.

5. Trench Bell Holes: Excavate bell holes deeply and widely enough to make joints and to allow the pipe barrel to rest firmly on the trench bottom.

6. Trench bottom: Excavate and shape trench bottoms to provide uniform bearing and support of pipes and conduits. Shape subgrade to provide continuous support of bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits/pipes. Remove projecting stones, tree roots, debris, and sharp objects along trench subgrade. Abrupt changes in grade of the trench bottom shall be avoided. Unless otherwise indicated in the Plans or The Facility Owner's Standard Specifications, trenches for water mains shall be graded as much as possible to avoid high and low points that necessitate air release valves.
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7. Excavations may be completed and refilled either by hand or by machinery. Hand tool excavation shall be conducted where necessary to protect existing utilities and structures.

8. In the event that unsuitable material is encountered at or below the excavation depth specified or shown on the Plans, the Utility Owner and GDOT Project Manager shall be notified. Such material shall be removed and replaced with suitable material in accordance with Section 205 by the written request of the GDOT Manager.

E. Connecting to Existing Mains

1. Connect to an existing main with the appropriate fittings according to the Plans or the Utility Owner and GDOT Project Manager. When making connections under pressure, (i.e. when normal water service must be maintained), furnish and use a tapping sleeve and valve assembly or line stop fittings as indicated. Coordinate with Utility Owner 72 hours in advance for water service interruptions and temporary shut-offs. Evening or weekend work may be required to complete direct connections and tie-ins. Connect to existing mains as follows:
   a. Before opening new pipeline trenches, locate the various points of connection to be made into existing pipelines. If necessary, uncover pipelines for the Utility Owner and GDOT Project Coordinators to prescribe the connections and fittings needed.
   b. Connect to existing pipelines only to meet operating requirements. Cut existing lines only after obtaining the Utility Owner and GDOT Project Manager’s permission.
   c. Provide temporary line stops, associated fittings, and bypass pumping as indicated on the Plans and as necessary when cutting and plugging existing water mains to prevent service interruptions. Line stop and associated fittings shall be suitable for working pressures of 250 psi.
   d. Connections to existing asbestos cement pipe shall be installed as indicated on the Plans or in the Facility Owner’s Standard Specifications. Cutting, removing, handling, and disposing of asbestos cement pipe shall be in accordance with requirements established by EPA, OSHA, GDOT, NIOSH, and the State of Georgia Environmental Protection Division, and any other applicable laws and ordinances.

F. Laying Water Mains and Appurtenances

1. Preparing and Handling Pipes
   a. Thoroughly clean the pipe and fittings before laying them. Keep them clean until accepted.
   b. Use suitable tools and equipment. Do not damage the pipe, especially the cement lining inside the pipe.
   c. Cut pipe in a manner to avoid damage to pipe or lining, leaving a smooth end at right angles to pipe axis. Smooth and bevel edges of cut pipe for push-on, gasket type joints.
   d. Bedding shall be provided as specified by the Utility Owner or pipe manufacturer for the type of conditions encountered. Bedding typically consists of granular soil free of lumps, clods, cobbles, and frozen materials, and shall be graded to a firm-but-yielding surface without abrupt changes in bearing value. Unstable soils and rock ledges shall be undercut from the bedding zone and replaced with suitable material.
   e. Bed pipe on coarse granular material in flat bottom trench with entire pipe barrel bearing uniformly on coarse granular material, except for an approximately 18-inch (450 mm) gap at pipe balance point for sling removal. Hand excavate and backfill as required to provide uniform and continuous bearing and support for the pipe. Do not support pipe on hubs or end bells. Consolidate coarse granular material under and around pipe up to pipe centerline by tamping.
   f. Join pipe with bells facing direction in which laying operation is progressing. Lay pipe upgrade wherever line grade exceeds 10%.
   g. Carefully examine pipe for cracks and other defects and do not lay defective pipe. If pipe or castings appear to be cracked, broken, or defective after laying, remove and replace those sections.

2. Alignment and Gradient
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a. Pipe alignment and gradient shall conform to the Plans. Deflect pipe lines only where indicated on the Plans, within allowable horizontal and vertical deflection angles according to the manufacturer.

b. Water mains shall be laid at least 10 feet (3 m) horizontally from any existing or proposed sanitary sewer, storm sewer or sewer manhole. The distance shall be measured edge-to-edge. When local conditions prevent a horizontal separation of 10 feet (3 m), the water main may, on a case-by-case basis, be laid closer to a sewer provided the water main is laid in a separate trench or on an undisturbed earth shelf located on one side of the sewer at such an elevation that the bottom of the water main is at least 18 inches (450 mm) above the top of the sewer.

c. Maintain a vertical separation of at least 18 inches (450 mm) between the crown of sanitary sewers and the invert of existing or proposed water mains with the sewer located below the water main. Where a vertical separation of 18 inches (450 mm) cannot be provided, and the water main cannot be relocated to provide adequate clearance, center one full length of water main over the sewer so that both joints of the water main will be as far from the sewer as possible.

3. Special Requirements for Laying Water Mains
a. Excavate, clean, lay, joint, and backfill progressively and uniformly according to these requirements:
   1) Never leave pipe in the trench overnight without completely jointing and capping.
   2) Do not leave completed pipeline exposed in the trench. Backfill and compact the trench as soon as possible after laying, jointing, and testing are complete.
   3) At the close of work each day and when laying pipe, close the exposed end of the pipeline in the trench with an approved wood or metal head or barrier.
   4) If necessary to cover the end of an incomplete pipeline with backfill, close the end of the pipe with a satisfactory cap or plug.

G. Installing Water Mains by Open Cut

1. Use the following flexible joints for connections inside the roadway shoulders or curbs and gutters:

   a. Mechanical Joints:
      1) When using mechanical joints, thoroughly wash bell sockets, spigots, gland, gasket, nuts, and bolts with soapy water before assembly. Keep these parts wet until the jointing operation is complete.
      2) Tighten nuts within the torque range recommended by the manufacturer. Check the tightening tolerance with a torque wrench.
      3) If effective sealing is not attained at the maximum recommended torque, disassemble, thoroughly clean, then reassemble the joint.
      4) Do not overstress bolts to compensate for improper installation or defective parts.

   b. Push-On Type Joints
      1) Use push-on joints made according to the manufacturer’s recommendations.
      2) Install PVC pipe in accordance with AWWA C605.
      3) Install ductile iron pipe in accordance with AWWA C600.

2. Restraints for pipe joints and fittings shall be provided as specified and as shown on the Plans. Restraints shall be installed per manufacturer’s recommendations.

3. Buried ductile iron pipe and fittings shall be polyethylene encased as specified and as indicated on the Plans. Polyethylene encasement tubing shall be secured with polyethylene tape and installed in accordance with ANSI/AWWA C105/A21.5.

4. Unless otherwise specified by The Facility Owner’s Standard Specifications, provide pipe detection wire on all non-metallic pipe systems. Tape the tracer wire to the top center of the pipe at intervals which prevent wire displacement during backfilling operations. Stub tracer wire up 6 inches (150 mm) above finished grade at all valves.
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and fire hydrants. For splices, use direct bury kits. After backfilling is complete, test electrical continuity of each tracer wire segment and provide test results to Utility Owner and GDOT Project Manager.

5. Install continuous underground warning tape during backfilling of trench for underground water distribution piping. Install 12 inches (300 mm) below finished grade, or 6 inches (150 mm) below subgrade under pavements and walkways, and buried directly over piping.

6. Use pipe cutters when cutting pipe or special castings. Do not use a hammer, chisel, or a cutting torch.

7. Locations where water mains do not meet minimum depth of cover requirements shall include a steel casing or concrete encasement installed per The Facility Owner’s Standard Specifications.

8. If HDPE pipe is to be installed where high groundwater table or water surrounding the pipe is expected, precautions shall be taken to provide neutral buoyancy to prevent floatation or a change in alignment.

9. Isolation Valves on Water Mains: Install and joint gate and butterfly valves as specified in Subsection 670.2.01 in accordance with AWWA C600. Include the valve box and valve marker where required.

10. Air release valves shall be located at high elevation points on the pipeline. Air release valves shall be installed at locations indicated in the Plans and in accordance with manufacturer’s recommendations.

11. Pressure reducing/sustaining valves of the size and type indicated shall be installed as shown on the Plans per manufacturer’s recommendations and The Facility Owner’s Standard Specifications.

12. Fire Hydrants: Install and joint hydrants as specified in Subsection 670.2.01 and in accordance with AWWA C600. Include required vertical extension sections. Also, include pipe strap installation, restraints, crushed stone drain, and backfill according to the Plans and this Section. Spacing of fire hydrants shall be as indicated in The Facility Owner’s Standard Specifications.

13. Concrete Thrust Collars and Thrust Blocks: If required, furnish materials and install thrust collars or concrete blocking according to Subsection 670.2.01. Form and pour concrete thrust collars or blocks in accordance with the Plans and The Facility Owner’s Standard Specifications. Blocking shall be poured against undisturbed earth and all forms shall be removed before backfilling.

14. Backfilling

a. Furnish equipment, labor, and when necessary material required for backfilling the pipe line trenches according to Section 207, and as follows:

1) When testing for visual leaks in open trenches, do not backfill until testing is complete and leaks are eliminated.

2) When retaining pavement adjacent to trenches, replace removed pavement with the same or better material when approved in accordance with the appropriate Section for the pavement type replaced.

3) Place backfill on subgrades free of mud, frost, snow, or ice.

4) Place and compact bedding course on trench bottoms and where indicated. Shape the bedding course to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits/pipes.

5) Backfill shall include Class I or Class II Soils as defined in Section 810 or suitable material that conforms with The Facility Owner’s Standard Specifications.

6) Backfill shall be placed in two stages: first, side fill to a height of 12 inches (300 mm) above the top of pipe; second, overfill to former surface grade. Side fill shall consist of granular material laid in 6-inch (150
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mm) layers each consolidated by mechanical tamping and controlled addition of moisture, to a density of 95% as determined by as determined by the Standard Proctor test (AASHTO T-99 Method D) or GDT 67. Overfill shall be layered and consolidated to match the entrenched material in cohesion and compaction. The top 12 inches (300 mm) shall be compacted to 100% of specified density. Consolidation by saturation or ponding shall not be permitted.

7) Soil Moisture Control: Uniformly moisten and aerate subgrade and each subsequent fill or backfill soil layer before compaction to within 2% of optimum moisture content. Remove and replace, or scarify and air dry, otherwise satisfactory soil material that exceeds optimum moisture content by 2% and is too wet to compact to specified dry unit weight.

8) Initial backfill shall be carefully compacted under pipe haunches and evenly up on both sides and along the full length of piping or conduit to avoid damage or displacement of piping or conduit. Place and compact fill and backfill of satisfactory soil to final subgrade elevation. Backfill voids with satisfactory soil while removing shoring and bracing and/or trench boxes.

9) After backfilling, maintain temporary surface restoration per GA Standard No. 1401 until permanent repaving is complete. No separate payment shall be made for replaced pavement.

15. Disinfection of Water Mains
   a. New and existing pipelines and appurtenances shall be disinfected before placing into service. Disinfection can be conducted in conjunction with the pressure test.
   b. Before the main is chlorinated, it shall be filled to eliminate air pockets and shall be flushed to remove particulates.
   c. During disinfection of the water mains, an appropriate cross-connection control device, consistent with the degree of hazard, shall be provided for backflow protection of the active distribution system.
   d. Chlorination: Sterilize using only potable water with calcium hypochlorite (HTH), 1% chlorine solution, or other products acceptable to the Utility Owner and GDOT Project Manager and Department of Public Health. Comply with AWWA C651 including Section 9 procedures on final connections to existing mains.
      1) The chlorine solution used for disinfection of water mains shall have a free chlorine residual concentration not less than 25 mg/L or in accordance with The Facility Owner’s Standard Specifications.
      2) Add enough disinfectant to provide a chlorine residual of not less than 10 parts per million (ppm) in 24 hours or as required in The Facility Owner’s Standard Specifications. All valves and hydrants shall be operated to ensure disinfection of the appurtenances.
      3) At the end of 24 hours, check the chlorine residual. If it is less than 10 ppm, add additional chlorine and check the line again after 24 hours.
   e. After the applicable retention period, the chlorinated water must not be disposed in a manner that will harm the environment. Neutralizing chemicals, such as Sulfur Dioxide, Sodium Bisulfite, Sodium Sulfite or Sodium Thiosulfate can be used to neutralize the chlorine residual remaining in the water to be wasted.
   f. After sterilization, flush the line with potable water until the chlorine residual is equal to the existing system.
      1) After final flushing and before the water main is placed into service, water samples shall be collected from the main and tested for microbiological quality in accordance with the Georgia Rules for Safe Drinking Water. Samples shall be taken in the presence of the Utility Owner and GDOT Project Manager.
      2) When test results are not satisfactory, the pipeline shall be flushed and disinfected again as necessary without additional compensation until satisfactory results are obtained.

H. Laying Service Lines and Appurtenances

1. Except as modified in this Section, construct and install service connection assemblies and lines according to the Plans and the requirements for laying water mains. Install service lines at locations shown on the Plans or where designated by the Utility Owner and GDOT Project Manager.
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2. Install new pipe from the water main to the final location of the meter or to points designated by the Utility Owner and GDOT Project Manager to connect with existing or future service lines on abutting property.

3. No water service connections shall be performed until the main is tested and disinfected. Water service lines shall be tested and disinfected prior to connection to the main.

4. If required, install water service line inside casing pipe according to the Plans or The Facility Owner’s specification document.

5. At roads, paved drives, retaining walls, and other paved areas, install service tubing or casing pipe by pushing, pulling, or augering techniques. At all other locations, install service tubing by trenching and backfilling unless directed otherwise by GDOT.

6. Service line installation includes all connections using saddles, unions, valves, fittings, corporation stops, curb stops, casing, and any and all appurtenant work required to provide a complete water service connection.

7. Excavate for service lines as specified in Subsection 670.3.05 with the following exceptions:
   a. Ensure that trenches under pavements and across driveways are deep enough to provide at least 48 in (1.2 m) of cover, unless otherwise specified by The Facility Owner’s Standard Specifications or directed by the Utility Owner and GDOT Project Manager.
   b. At other areas, trench depth and backfill cover may be adjusted at the discretion of the Utility Owner and GDOT Project Manager to provide at least 18 in (450 mm) of cover.

8. Backfill service lines as specified in Subsection 670.3.05.

9. All service lines, fittings, and appurtenances necessary for the water service connections shall be installed and backfilled in accordance with the manufacturer’s recommendations and as per The Facility Owner’s Standard Specifications and standard details.

I. Cutting and Capping Existing Water Mains

1. Disconnect by sawing or cutting and removing a segment of existing pipe where cutting and capping or plugging is shown on the Plans or directed by the Utility Owner or GDOT Project Manager. Provide a watertight pipe cap or plug and restraint mechanism to seal off existing mains indicated to remain in service. If water main is to be abandoned or removed and not specified to be grout filled, seal ends with a pipe cap or plug or with a masonry plug and minimum 6-inch (150 mm) cover of concrete on all sides around the end of the pipe.

2. The Contractor shall be responsible for uncovering and verifying the size and material of the existing main to be capped or plugged.

3. Abandoned manholes and water mains greater than 6-inch (150 mm) shall be filled with flowable fill per Section 600 at the locations indicated on the Plans. Air release valves and water service connections along the abandoned main shall be plugged prior to grouting. Prior to backfilling, the bottom of the manhole shall be broken up in such a manner that water will readily pass through. The top portion of the manhole structure shall be removed in order to establish a minimum of 3 feet cover from subgrade or finished grade when not under the pavement and filled with sand or suitable backfill.

4. Water mains shall be flushed prior to placement of flowable fill. Use concrete or grout pumps capable of continuous delivery at planned placement rate with sufficient pressure to overcome friction and fill the sewer main.

J. Relocating, Adjusting, and Removing

1. Fire Hydrant Assemblies
   a. Relocate, adjust to grade, or remove fire hydrant assemblies including valve and valve boxes according to the Plans or as designated by the Utility Owner and GDOT Project Manager.
   b. Protect items during removal and relocation. Replace lost or damaged Items at no expense to GDOT or the Utility Owner.
   c. Disconnect each joint before removing items from the trench.
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d. Install relocated fire hydrant assemblies with tapping sleeve, and as specified herein for new fire hydrant assemblies.

e. Test for leakage, adjust, and retest until no leaks appear.

f. Backfill as specified in Subsection 670.3.05.

g. Consider valve boxes part of the valve assembly and remove them intact with the valve.

2. Water Valves and Boxes

a. Adjust or remove water valves and valve boxes according to the Plans or as designated by the Utility Owner and GDOT Project Manager.

b. Protect items during adjustment or removal. Replace lost or damaged Items at no expense to GDOT or the Utility Owner.

c. Disconnect each joint before removing items from the trench.

d. Test for leakage, adjust, and retest until no leaks appear.

e. Backfill as specified in Subsection 670.3.05.

f. Consider valve boxes part of the valve assembly and remove them intact with the valve.

3. Existing Water Meters and Boxes

a. Relocate existing water meters and boxes according to the Plans or the Utility Owner and GDOT Project Manager.

b. To relocate meters, remove the existing meter, associated backflow preventer, and box and replace with a short section of pipe.

c. Inspect along with the Utility Owner and GDOT Project Manager each meter and backflow preventer before removal to determine the condition of each.

d. Unless specified otherwise in the Plans or The Facility Owner’s Standard Specifications, new water meters and backflow preventers shall be furnished by the Contractor as necessary if these devices are deemed unsuitable for reuse. Contractor shall provide new water meter boxes if deemed unsuitable for reuse. The Contractor shall coordinate delivery of the water meters and backflow preventers to correspond to construction operations to minimize service interruptions.

e. Relocation of water meters and boxes shall include without additional compensation, required pipe, unions and appurtenances, adapter fittings, necessary storage protection, and installation of meter, backflow preventer, meter box, and curb stop in the existing service line.

4. Existing Water Service Lines

a. Water lines shall be adjusted to grade by excavating the existing lines, lowering or raising the lines, and backfilling according to the Plans or the Utility Owner and GDOT Project Manager.

b. Furnish new materials or fittings required for the adjustment without additional compensation.

c. Change connections at the main that result from this work.

d. Repair leaks and damage caused by the operations at no expense to GDOT.

e. When retaining a water meter where an existing service line is to be adjusted, adjust the existing meter and box to the proper grade without additional compensation.

5. Other Water Appurtenances

a. Relocate, adjust to grade, or remove water main appurtenances including but not limited to air release valves, backflow preventers, pressure reducing/sustaining valves according to the Plans or as designated by the Utility Owner and GDOT Project Manager.

6. Utility related items identified on the Plans to be salvaged are the property of the Utility Owner. Contractor shall coordinate with Utility Owner on delivery of salvaged materials. Should the Utility Owner choose to not accept these materials they shall be removed from the project site as soon as practical.

K. Aerial Crossings

1. Support must be provided for all joints in pipes utilized for aerial crossings. The supports must be installed to prevent frost heave, overturning, and settlement. Precautions against freezing, such as insulation, shall be provided.
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2. When the aerial crossing is accomplished by attachment to a bridge or drainage structure, the crossing shall meet all requirements of the agencies that own or have jurisdiction over such structures.

3. Aerial installations shall be installed to avoid or minimize streamblockage during normal high water events.

4. Underground valves shall be provided at both ends of the aerial crossing so that the section can be isolated for testing or repair. The valves shall be restrained, easily accessible, and not subject to flooding. An air release/vacuum relief valve shall be installed at all high points along the aerial crossing.

5. Appropriate guards shall be installed at both ends of the aerial crossing to prevent public access to the pipe.

670.3.06 Quality Acceptance

A. Materials Certification

For certain products, assemblies and materials, not on GDOT QPL List, and in lieu of normal sampling and testing procedures by the Contractor, the Utility Owner, and GDOT may accept from the Contractor the manufacturer’s certification with respect to the product involved under the conditions set forth in the following paragraphs:

1. Material certifications shall be provided to GDOT, who shall distribute to the Utility Owner. Material certifications shall be approved by GDOT and the Utility Owner prior to construction. The certification shall state/specify that the named product conforms to these specifications and requirements of the Utility Owner and GDOT, and representatives thereof have been sampled and tested as specified.

2. The certification shall either:
   a. Be accompanied by a certified copy of the test results, or
   b. Certify such test results are on file with the manufacturer and will be furnished to the Utility Owner and GDOT Project Coordinators upon demand.

3. The certification shall state/specify the name and address of the manufacturer and the testing agency and the date of tests; and set forth the means of identification which shall permit field determination of the product delivered to the project as being the product covered by the certification.

4. Submit certification in triplicate with two copies of the covered product to the GDOT Project Coordinator, and one copy sent to GDOT’s State Materials and Research Engineer at 15 Kennedy Drive, Forest Park, Georgia. The certification shall specify the project number and contract ID number. No certificate shall be required for Portland cement when furnished from a manufacturer approved by GDOT.

5. GDOT or the Utility Owner will not be responsible for any costs of certification or for any costs of the sampling and testing of products in connection therewith.

6. GDOT and the Utility Owner reserve the right to require samples and test products for compliance with pertinent requirements irrespective of prior certification of the products by the manufacturer. Any materials that fail to meet specification requirements will be rejected.

7. In accordance with the BUY AMERICA requirements of the Federal regulations (23 U.S.C. 313 and 23 CFR 635.410) all manufacturing processes for steel and iron products or predominantly of steel or iron (at least 90% steel or iron content) furnished for permanent incorporation into the work on this project shall occur in the United States. The only exception to this requirement is the production of pig iron and the processing, pelletizing and reduction of iron ore, which may occur in another country. Other than these exceptions, all melting, rolling, extruding, machining, bending, grinding, drilling, coating, etc. must occur in the United States.
   a. Products of steel include, but are not limited to, such products as structural steel piles, reinforcing steel, structural plate, steel culverts, guardrail steel supports for signs, signals and luminaires. Products of iron include, but are not limited to, such products as cast iron frames and grates and ductile iron pipe. Coatings include, but are not limited to, the applications of epoxy, galvanizing and paint. The coating material is not limited to this clause, only the application process.
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b. Records to be provided by the Contractor for this certification shall include a signed mill test report and a signed certification by each supplier, distributor, fabricator, and manufacturer that has handled the steel or iron product affirming that every process, including the application of a coating, performed on the steel or iron product has been carried out in the United States of America, except as allowed by this Section. The lack of these certifications will be justification for rejection of the steel and/or iron product on nonpayment of the work.

c. The requirements of said law and regulations do not prevent the use of miscellaneous steel or iron components, subcomponents and hardware necessary to encase, assemble and construct the above products, manufactured products that are not predominantly steel or iron or a minimal use of foreign steel and iron materials if the cost of such materials used does not exceed one-tenth of one percent (0.1%) of the total contract price or $2,500.00, whichever is greater.

B. Flushing

1. Prior to testing, water mains shall be cleaned and flushed to remove all sand and foreign matter. Water used for filling and cleaning shall be from an approved potable water source. Sufficient flushing water shall be introduced into the mains to produce a scouring velocity of not less than 3.5 feet per second to resuspend the solids, and this rate of flow shall be continued until the discharge is clear and no evidence of silt or foreign matter is visible. The Contractor shall dispose of all water used for flushing without causing a nuisance or property damage.

2. In the event that the Contractor cannot obtain the flushing velocity, a poly-pig swab may be used to clean the pipeline. The Contractor shall submit pigging plan to the Utility Owner and GDOT for review. The plan shall include type of pig material, water flow rate, discharge points, poly-pig detector and retrieval options.

C. Hydrostatic Testing of Water Mains

1. When the Utility Owner and GDOT Project Manager approve a section of pipe for testing, the Contractor shall furnish the materials, equipment, and labor to conduct the pressure and leakage tests. Use a test pump, pressure gauge, and a means of measuring the water necessary to maintain the required pressure during the prescribed testing time. All pressure and leakage testing shall be done in the presence of the Utility Owner and GDOT Project Coordinators as a condition precedent to the approval and acceptance of the system. All pipes shall have been thoroughly flushed prior to testing. Simultaneous or separate pressure and leakage tests may be performed.

2. All water for testing and flushing shall be potable water provided by the Contractor, at no cost to the Utility Owner or GDOT, from an approved source. Flow velocity during line filling shall not exceed 2 feet (0.6 m) per second (fps).

3. Testing Requirements

a. Water mains shall be tested in sections between valves, thereby, testing each valve for secure closure. Testing shall be done immediately after installation and backfilling has been completed.

b. The mains shall be tested in accordance with the latest revision of AWWA C600 for ductile iron and C605 for PVC under an average hydrostatic pressure of the greater of 1.5 times the maximum working pressure or 150 psi as measured at the lowest point in the system for a minimum of 2 hours. Pressure shall be maintained until all sections under testing have been checked for evidence of leakage.

c. While the system is being filled with water, air shall be carefully and completely exhausted. If permanent air vents are not located at all high points, the Contractor shall install corporation stops or fittings and valves at such points at no additional expense to the Utility so the air can be expelled as the pipe system is slowly filled.

d. Makeup water shall be added, as required, to maintain the pressure within 5 psi of the test pressure. The quantity used shall be measured by pumping from a calibrated container. The maximum amount of makeup water allowed shall be determined by the following formula:

\[ L = \frac{S \times D \times P^{0.5}}{148,000} \]
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in which,

\[ L = \text{Allowable Leakage in gallons per hour} \]
\[ S = \text{Length of pipe being tested in feet} \]
\[ D = \text{Nominal pipe diameter in inches} \]
\[ P = \text{Average test pressure during the test in psi gauge} \]

e. Visible leaks shall be corrected regardless of total leakage shown by test. All pipe fittings and other materials found to be defective under test shall be removed and replaced. Lines which fail to meet test requirements shall be repaired and retested as necessary until test requirements are met. No additional compensation shall be made for repairs or retesting.

670.3.07 Contractor Warranty and Maintenance

General Provisions 101 through 150.

670.4 Measurement

Incidentals including excavation, rock removal, backfilling, disinfection, testing, temporary water connections, pavement removal, pavement replacement, and other incidentals required for the installation of water distribution items are not measured for separate payment and shall be included in the applicable Pay Items below. Water mains, service lines, and other associated items of work in this Specification, complete, in place, and accepted, are measured for payment as follows:

A. Ductile Iron Water Mains

Ductile iron water mains shall be measured in linear feet (meters) for each size, thickness class, and type (restrained, non-restrained) installed. Measurement shall be horizontally above the centerline of the pipe and shall include the length of valves and fittings.

B. PVC Water Main

PVC water mains shall be measured in linear feet (meters) for each size and type (restrained, non-restrained) installed. Measurement shall be horizontally above the centerline of the pipe and shall include the length of valves and fittings.

C. Fusible PVC Water Main

Fusible PVC water mains shall be measured in linear feet (meters) for each size and type installed. Measurement shall be horizontally above the centerline of the pipe and shall include the length of valves and fittings.

D. HDPE Water Main

HDPE water mains shall be measured in linear feet (meters) for each size and type installed. Measurement shall be horizontally above the centerline of the pipe and shall include the length of valves and fittings.

E. Ductile Iron Fittings

Ductile iron fittings are considered subsidiary to the water line in which they are used and are not measured for separate payment. This Item includes, but is not limited to, wyes, tees, bends, crosses, sleeves, plugs and caps, and reducers.

F. Restrained Joints

Joint restraints used with the installation of PVC or ductile iron pipe are considered subsidiary to the water line in which they are used and are not measured for separate payment.

G. Gate Valves

Gate valves shall be measured on an individual basis for each size valve and box assembly acceptably installed.
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H. Butterfly Valves
   Butterfly valves shall be measured on an individual basis on the number of each size valve and box assembly acceptably installed.

I. Tapping Sleeve and Valve Assembly
   Tapping sleeve and valve assemblies shall be measured on an individual basis on the number of each size tapping sleeve and valve assembly acceptably installed.

J. Double Strap Saddle
   Double strap saddles shall be measured on an individual basis on the number of each size double strap saddle acceptably installed.

K. Fire Hydrant Assemblies
   Fire hydrant assemblies shall be measured on an individual basis on the number of hydrants acceptably installed.

L. Water Service Lines
   Service lines shall be measured in linear feet (meters) for each size of service pipe installed. Measurements are made from end to end and from center of lines to ends of branches and include tapping saddle, sleeve, valves, service connection assemblies, sleeves, adapters, and fittings.

M. Air Release Valve Assembly
   Air release valve assemblies shall be measured on an individual basis on the number of each size and type of air release valve assembly acceptably installed.

N. Pressure Reducing / Sustaining Valve
   Pressure reducing/sustaining valve shall be measured on an individual basis on the number of each pressure reducing/sustaining valves acceptably installed.

O. Blow-Off Assemblies
   Blow-off assemblies shall be measured on an individual basis on the number of each blow-off assembly acceptably installed.

P. Backflow Prevention Assembly
   Backflow prevention assemblies shall be measured on an individual basis on the number of each size and type backflow preventer acceptably installed.

Q. Water Meter
   Water meters shall be measured on an individual basis on the number of each size meter acceptably installed.

R. Steel Casing
   Steel casing pipe of the wall thickness and diameter specified shall be measured by the linear foot for each size and thickness of steel casing pipe installed. Measurement shall be horizontally above the centerline of the casing.

S. Relocation of Existing Fire Hydrant Assemblies, Air Release Valves, Water Meters, Water Backflow Preventers, Pressure Reducing or Sustaining Valves, Water Valves and Water Meter including Bypass and Vault
   Relocation of existing fire hydrant assemblies, air release valves, water meters, backflow preventers, pressure reducing or sustaining valves, water valves, and water meter including bypass and vault shall be measured on an individual basis on the number of each acceptably relocated including relocation and final adjustment of boxes.

T. Adjustment of Existing Meter Boxes and Valve Boxes to Grade
   Adjustment of existing meter boxes and valve boxes adjusted to grade in their original locations shall be measured on an individual basis on the number of each acceptably adjusted in accordance with Section 611.
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U. Adjustment of Blow-Off Assembly
   Adjustment of blow-off assembly to grade in their original locations shall be measured on an individual basis on the number of each acceptably adjusted.

V. Adjustment of Existing Fire Hydrant Assembly
   Adjustment of existing fire hydrant assembly to grade in their original locations shall be measured on an individual basis on the number of each acceptably adjusted.

W. Adjustment of Existing Backflow Preventers
   Adjustment of existing backflow preventers to grade in their original locations shall be measured on an individual basis on the number of each acceptably adjusted.

X. Removal of Water Meters, Fire Hydrant Assemblies, Backflow Preventers, Water Valves, and Air Release Valves
   Removal of existing water meters and boxes, fire hydrants assemblies, backflow preventers, water valves, and air release valves, shall be measured on an individual basis on the number of each removed.

Y. Adjustment of Water Service Lines
   Adjustment of water service lines shall be measured in linear feet (meters) of service line pipe lowered or raised, and shall include the length of valves, fittings, meters, boxes, and other appurtenances. Measurements are made from end to end of actual adjustments.

Z. Concrete Thrust Blocks
   Concrete thrust blocking installed shall be measured as indicated in Section 500 per cubic yard of concrete acceptably installed. When Concrete Thrust Blocks is not shown as a pay item, include the cost of the work in the bid price for the appropriate item.

AA. Concrete Thrust Collars
   Concrete thrust collars shall be measured on an individual basis on the number of each size thrust collar acceptably installed. When Concrete Thrust Collars is not shown as a pay item, include the cost of the work in the bid price for the appropriate item

BB. Cut and Plug Existing Water Main
   Cutting and plugging of existing water mains shall be measured on an individual basis per each instance of cutting and plugging existing mains as shown on the Plans.

CC. Removal of Water Mains
   Unless specified removal of water mains shall be removed in accordance with Section 210. If specified removal of water mains shall be measured per linear foot for each size pipe actually removed in accordance with Section 610. Measurement shall be horizontally above the centerline of the pipe removed and shall include the length of valves and fittings.

DD. Line Stop
   Line stops shall be measured on an individual basis on the number of each size line stop actually installed.

EE. Flowable Fill
   Flowable fill shall be measured as indicted in Section 600 per cubic yard of flowable fill acceptably installed. When flowable fill is not shown as a pay item, include the cost of the work in the bid price for the appropriate item.

FF. Insertion Valve
   Insertion valves shall be measured on an individual basis on the number of each size valve acceptably installed.
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GG. Three-Dimensional (3D) Survey

Three-dimensional survey shall be measured as one lump sum for a complete and accepted survey. This item will be included in the overall pipe measurement. No separate payment for this work.

670.4.01 Limits

General Provisions 101 through 150.

670.5 Payment

The Contract Unit Price for each Item, complete and accepted, shall include all costs incidental to the construction of the Item according to the Plans and as specified in this Section. The unit prices bid shall include due allowance for the salvage value of all materials removed from existing or temporary lines and not installed in the completed work. All such surplus items shall become the property of the Contractor unless such surplus items are specified to be salvaged. Payment for any Item listed below is full compensation for the Item or Items complete in place.

A. Ductile Iron Water Mains

Ductile iron mains shall be paid for at the unit price per linear foot for each diameter pipe installed and shall cover the cost for all materials, transportation, labor, equipment, excavation, sheeting and shoring, installation of pipe, joints and jointing materials, anchoring, warning tape, polyethylene encasement, protection of existing utilities, connections to existing water mains, sampling taps, temporary blow-offs, flushing, cleaning, pigging, chlorine for disinfection, disinfection, backfilling, backfill materials, disposal of unsuitable backfill material, tamping, testing, densities, utility crossings, dewatering, trench stabilization, clean-up, restoration and all work and materials necessary to place the pipe into service.

B. PVC Water Main

PVC water mains shall be paid for at the unit price per linear foot for each diameter pipe installed and shall cover the cost for all materials, transportation, labor, equipment, excavation, sheeting and shoring, installation of pipe, anchoring, tracer wire, warning tape, protection of existing utilities, connections to existing water mains, sampling taps, temporary blow-offs, flushing, cleaning, pigging, chlorine for disinfection, disinfection, backfilling, backfill materials, disposal of unsuitable backfill material, tamping, testing, densities, utility crossings, dewatering, trench stabilization, clean-up, restoration, and all work and materials necessary to place the pipe into service.

C. Fusible PVC Water Main

Fusible PVC water mains shall be paid for at the unit price per linear foot for each diameter pipe installed and shall cover the cost for all materials, transportation, labor, equipment, excavation, sheeting and shoring, entry/exit pits, installation of pipe, joints and jointing materials, tracer wire, warning tape, mechanical joint adapters, protection of existing utilities, connections to existing water mains, fusion process materials and equipment, directional drilling materials and equipment, tracking system, assembling, welding, supporting, stringing, pulling, pigging, cleaning, sampling taps, temporary blow-offs, flushing, chlorine for disinfection, disinfection, backfilling, backfill materials, disposal of unsuitable backfill material, tamping, testing, densities, utility crossings, dewatering, trench stabilization, clean-up, restoration, and all incidentals necessary to place the pipe into service except where such items are shown to be paid for under a separate Pay Item.

D. HDPE Water Main

HDPE water mains shall be paid for at the unit price per linear foot for each diameter pipe installed and shall cover the cost for all materials, transportation, labor, equipment, excavation, sheeting and shoring, entry/exit pits, installation of pipe, tracer wire, warning tape, mechanical joint adapters, protection of existing utilities, connections to existing water mains, fusion process materials and equipment, directional drilling materials and equipment, tracking system, assembling, welding, supporting, stringing, pulling, pigging, cleaning, sampling taps, temporary blow-offs, flushing, chlorine for disinfection, disinfection, backfilling, backfill materials, disposal of unsuitable backfill material, tamping, testing, densities, utility crossings, dewatering, trench stabilization, clean-up, and restoration, and all incidentals.
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E. Ductile Iron Fittings

Ductile iron fittings are considered subsidiary to the water line in which they are used and are not measured for separate payment as outlined in the manufacturers’catalogues and shall cover the cost for all materials, transportation, labor, equipment, excavation, sheeting and shoring, installation of fittings, joints and jointing materials, anchoring, warning tape, polyethylene encasement, protection of existing utilities, flushing, chlorine for disinfection, disinfection, backfilling, backfill material, disposal of unsuitable backfill material, tamping, testing, densities, utility crossings, dewatering, trench stabilization, clean-up, restoration, all other related and necessary materials, work and equipment required to install a complete and operable pipeline fitting. This Item includes, but is not limited to, wyes, tees, bends, crosses, sleeves, plugs and caps, couplings, and reducers.

F. Restrained Joints

Restrained joints are considered subsidiary to the water line in which they are used and are not measured for separate payment as outlined in the manufacturers’catalogues and shall cover the cost for all materials, transportation, labor, equipment, excavation, sheeting, shoring, installation of the restraint device, polyethylene encasement, protection of existing utilities, backfilling, backfill material, disposal of unsuitable backfill materials, tamping, testing, densities, utility crossings, dewatering, trench stabilization, clean-up, restoration, and all work and materials necessary to install the restrained joint.

G. Gate Valves

Gate valves shall be paid for at the unit price per each size gate valve and box assembly installed and shall cover the cost for all materials, transportation, labor, equipment, excavation, sheeting and shoring, installation of the gate valves (including valve box), concrete pad or collar, valve identification disc, valve marker, valve tag, polyethylene encasement, protection of existing utilities, chlorine for disinfection, disinfection, backfilling, backfill material, disposal of unsuitable backfill materials, tamping, testing, densities, utility crossings, dewatering, trench stabilization, clean-up, restoration, and all work and materials necessary to install the gate valve and place it in service.

H. Butterfly Valves

Butterfly valves shall be paid for at the unit price per each size butterfly valve and box assembly installed and shall cover the cost for all materials, transportation, labor, equipment, excavation, sheeting and shoring, installation of the butterfly valves including valve box, concrete pad or collar, valve identification disc, valve marker, valve tag, polyethylene encasement, protection of existing utilities, chlorine for disinfection, disinfection, backfilling, backfill material, disposal of unsuitable backfill materials, tamping, testing, densities, utility crossings, dewatering, trench stabilization, clean-up, restoration and all work and materials necessary to install the butterfly valve and place it in service.

I. Tapping Sleeve and Valve Assembly

Tapping sleeve and valves assemblies shall be paid for at the unit price per each size tapping sleeve and valve assembly installed and shall cover the cost for all materials, transportation, labor, equipment, excavation, sheeting and shoring, installation of tapping sleeves and valve assemblies including valve box, concrete pad or collar, valve marker, valve tag, polyethylene encasement, protection of existing utilities, tapping the potable water main, chlorine for disinfection, disinfection, sampling points, backfilling, backfill material, disposal of unsuitable backfill materials, tamping, testing, densities, utility crossings, dewatering, trench stabilization, clean-up, restoration, and all work and necessary hardware to install the tapping sleeve assembly and valve and place it in service.

J. Tapping Sleeve

Tapping sleeves shall be paid for at the unit price per each size tapping sleeve installed and shall cover the cost for all materials, transportation, labor, equipment, excavation, sheeting and shoring, installation of tapping sleeves, concrete pad or collar, valve marker, valve tag, polyethylene encasement, protection of existing utilities, tapping the potable water main, chlorine for disinfection, disinfection, sampling points, backfilling, backfill material, disposal of unsuitable backfill materials, tamping, testing, densities, utility crossings, dewatering, trench stabilization, clean-up, restoration, and all work and necessary hardware to install the tapping sleeve assembly and valve and place it in service.
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materials, tamping, testing, densities, utility crossings, dewatering, trench stabilization, clean-up, restoration, and all work and necessary hardware to install the tapping sleeve and place it in service.

K. Double Strap Saddle

Double strap saddles shall be paid for at the unit price per each size double strap saddle installed and shall cover the cost for all materials, transportation, labor, equipment, excavation, sheeting and shoring, installation of double strap saddles, concrete pad or collar, valve marker, valve tag, polyethylene encasement, protection of existing utilities, tapping the potable water main, chlorine for disinfection, disinfection, sampling points, backfilling, backfill material, disposal of unsuitable backfill materials, taping, testing, densities utility crossings, dewatering, trench stabilization, clean-up, restoration, and all work and necessary hardware to install the double strap saddle.

L. Fire Hydrant Assembly

Fire hydrant assemblies shall be paid for at the unit price per each hydrant installed and shall cover the cost for all materials, transportation, labor, equipment, excavation, sheeting and shoring, installation of the fire hydrant assemblies (all configurations), vertical extensions, tapping sleeve, valve, hydrant lead piping, joint connections, fittings, tees, restraints, crushed stone drain, polyethylene encasement, protection of existing utilities, valve box, concrete pad or collar, valve identification disc, valve marker, valve tag, chlorine for disinfection, disinfection, backfilling, backfill material, disposal of unsuitable backfill materials, taping, testing, densities, utility crossings, dewatering, trench stabilization, clean-up, restoration, and all work and materials necessary to install the fire hydrant assembly and place it in service.

M. Water Service Line

Water service lines shall be paid for at the unit price per linear feet (meters) of the size service line installed and shall cover the cost for all materials, transportation, labor, equipment, excavation, sheeting and shoring, installation of water service line, tracer wire, tapping saddle, sleeve, corporation stops, fittings, curb stops, casing pipe, plugging abandoned water service connection, removal of abandoned water service line, protection of existing utilities, locating and connection to existing or new water main, chlorine for disinfection, disinfection, sampling points, backfilling, backfill materials, disposal of unsuitable backfill material, taping, testing, densities, utility crossings, dewatering, trench stabilization, clean-up, restoration, and all work and materials necessary to place the water service line into service. Water meter and box shall be paid for under a separate Pay Item.

N. Water Meter and Box

Water meters shall be paid for at the unit price per each size water meter installed and shall cover the cost for all materials, transportation, labor, equipment, excavation, sheeting and shoring, installation of the meter and box, adjustment to final grade, fittings, protection of existing utilities, chlorine for disinfection, disinfection, backfilling, backfill materials, disposal of unsuitable backfill material, taping, testing, densities, utility crossings, dewatering, trench stabilization, clean-up, restoration, and all work and materials necessary to place the meter into service except where such items are to be paid for under a separate Pay Item.

O. Backflow Prevention Assembly

Backflow prevention assemblies shall be paid for at the unit price per each type backflow preventer installed and shall cover the cost for all materials, transportation, labor, equipment, excavation, sheeting and shoring, installation of the backflow preventer, concrete vault, adjustment to final grade, testing and certification, fittings, tees, restraints, protection of existing utilities, chlorine for disinfection, disinfection, backfilling, backfill materials, disposal of unsuitable backfill material, taping, testing, densities, utility crossings, dewatering, trench stabilization, clean-up, restoration, and all work and materials necessary to place the meter into service except where such items are to be paid for under a separate Pay Item.

P. Air Release Valve Assembly

Air release valve assemblies shall be paid for at the unit price per each size and type of air release valve assembly...
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installed and shall cover the cost for all materials, transportation, labor, equipment, excavation, sheeting and shoring, installation of the air release assembly, tapping saddle, isolation valve, reducers, piping, restraints, fittings, tracer wire, concrete manhole or vault, ring and cover, protection of existing utilities, chlorine for disinfection, disinfection, backfilling, backfill materials, disposal of unsuitable backfill material, tamping, testing, densities, utility crossings, dewatering, trench stabilization, clean-up, restoration, and all work and materials necessary to place the air release assembly into service.

Q. Pressure Reducing / Sustaining Valve

Pressure reducing / sustaining valve shall be paid for at the unit price per each size and type of pressure reducing / sustaining valve installed and shall cover the cost for all materials, transportation, labor, equipment, excavation, sheeting and shoring, installation of the pressure reducing / sustaining valve, reducers, piping, restraints, fittings, tracer wire, concrete manhole or vault, ring and cover, tracer wire, protection of existing utilities, chlorine for disinfection, disinfection, backfilling, backfill materials, disposal of unsuitable backfill material, tamping, testing, densities, utility crossings, dewatering, trench stabilization, clean-up, restoration, and all work and materials necessary to place the pressure reducing / sustaining valve into service.

R. Blow-Off Assembly

Blow-off assemblies shall be paid for at the unit price per each blow-off assembly installed and shall cover the cost for all materials, transportation, labor, equipment, excavation, sheeting and shoring, installation of the blow-off assembly, valves, valve boxes, concrete pad or collar, piping, restraints, fittings, tracer wire, protection of existing utilities, chlorine for disinfection, disinfection, backfilling, backfill materials, disposal of unsuitable backfill material, tamping, testing, densities, utility crossings, dewatering, trench stabilization, clean-up, restoration, and all work and materials necessary to place the blow-off assembly into service.

S. Steel Casing

Steel casing pipe shall be paid for at the unit price per linear foot according to the diameter and thickness of the steel casing installed and shall cover the cost for all materials, transportation, labor, equipment, excavation, sheeting and shoring, protection of existing utilities, steel casing pipe, skid, steel straps, coatings, casing spacers, end seals, boring and jacking pits, backfilling, backfill materials, disposal of unsuitable backfill material, tamping, testing, densities, dewatering, trench stabilization, clean-up, restoration, and all work and materials necessary to install the steel casing except where such items are shown to be paid for under a separate Item. The carrier pipe shall be paid from other applicable Pay Item.

T. Relocation of Existing Air Release Valve

Relocation of air release valves shall be paid for at the unit price per each air release valve assembly relocated and shall cover the cost for all materials, transportation, labor, equipment, excavation, sheathing and shoring, removal of existing air release valve assembly, installation at another location, piping, restraints, tracer wire, fittings, adjustment to final grade, polyethylene encasement, protection of existing utilities, chlorine for disinfection, disinfection backfilling, backfill material, disposal of unsuitable backfill materials, tamping, testing, densities, dewatering, trench stabilization, clean-up, restoration and all work necessary to locate, remove and relocate the air release valve except where such items are shown to be paid for under a separate Pay Item.

U. Relocation of Existing Fire Hydrant Assembly

Relocation of fire hydrants shall be paid for at the unit price per each hydrant assembly relocated and shall cover the cost for all materials, transportation, labor, equipment, excavation, sheathing and shoring, removal of existing fire hydrant assembly, installation at another location, vertical extensions, hydrant lead piping, joint connections, fittings, tees, restraints, crushed stone drain, polyethylene encasement, valve box, concrete pad or collar, valve identification disc, valve marker, adjustment to final grade, protection of existing utilities, chlorine for disinfection, disinfection, backfilling,
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backfill material, disposal of unsuitable backfill materials, tamping, testing, densities, dewatering, trench stabilization, clean-up, restoration, and all work necessary to locate, remove and relocate the hydrant.

V. Relocation of Existing Backflow Prevention Devices

Relocation of backflow prevention devices shall be paid for at the unit price per each backflow preventer relocated and shall cover the cost of all materials, transportation, labor, equipment, excavation, sheeting and shoring, removal of existing backflow preventer, installation at another location, adjustment to final grade, testing and certification, fittings, tees, restraints, protection of existing utilities, chlorine for disinfection, disinfection, backfilling, backfill material, disposal of unsuitable backfill materials, tamping, testing, densities, utility crossings, dewatering, trench stabilization, clean-up, restoration, and all work necessary to locate, remove and relocate the backflow prevention device. The service line from the main to the relocated backflow preventer shall be paid for under a separate Pay Item.

W. Relocation of Water Meter and Box

Relocation of existing water meter and boxes shall be paid for at the unit price of each water meter and box relocated and shall cover the cost of all materials, transportation, labor, equipment, excavation, sheeting and shoring, removal of existing water meter and box, installation at another location, adjustment to final grade, protection of existing utilities, chlorine for disinfection, disinfection, backfilling, backfill material, disposal of unsuitable backfill materials, tamping, testing, densities, utility crossings, dewatering, trench stabilization, clean-up, restoration, and all work and materials necessary to relocate the water meter and box except where such items are shown to be paid for under a separate item. The new service line from the main to the relocated meter shall be paid for under a separate Pay Item.

X. Relocation of Water Meter, including Bypass and Vault

Relocation of existing water meter including bypass and vault shall be paid for at the unit price of each water meter including bypass and vault relocated and shall cover the cost of all materials, transportation, labor, equipment, excavation, sheeting and shoring, removal of existing water meter, bypass and vault, installation at another location, adjustment to final grade, protection of existing utilities, chlorine for disinfection, disinfection, backfilling, backfill material, disposal of unsuitable backfill materials, tamping, testing, densities, utility crossings, dewatering, trench stabilization, clean-up, restoration, and all work and materials necessary to relocate the water meter including bypass and vault except where such items are shown to be paid for under a separate item. The new service line from the main to the relocated meter bypass and vault shall be paid for under a separate Pay Item.

Y. Relocation of Pressure Reducing/Sustaining Valve

Relocation of pressure reducing/sustaining valve shall be paid for at the unit price of each pressure reducing/sustaining valve relocated and shall cover the cost of all materials, transportation, labor, equipment, excavation, sheeting and shoring, removal of existing water meter and box, installation at another location, adjustment to final grade, protection of existing utilities, chlorine for disinfection, disinfection, backfilling, backfill material, disposal of unsuitable backfill materials, tamping, testing, densities, utility crossings, dewatering, trench stabilization, clean-up, restoration, and all work and materials necessary to relocate the water meter and box except where such items are shown to be paid for under a separate item. The new service line from the main to the relocated pressure reducing/sustaining valve shall be paid for under a separate Pay Item.

Z. Relocation of Water Valve and Box

Relocation of existing water valves and boxes shall be paid for at the unit price of each water valve and box relocated and shall cover the cost of all materials, transportation, labor, equipment, excavation, sheeting and shoring, removal of existing water meter and box, installation at another location, adjustment to final grade, protection of existing utilities, chlorine for disinfection, disinfection, backfilling, backfill material, disposal of unsuitable backfill materials, tamping, testing, densities, utility crossings, dewatering, trench stabilization, clean-up, restoration, and all work and materials necessary to relocate the water meter and box except where such items are shown to be paid for under a separate item. The new service line from the main to the relocated valve shall be paid for under a separate Pay Item.
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AA. Adjustment of Existing Water Service Line

Adjustment of existing water service lines shall be paid in accordance with Section 611, for at the unit price per linear foot of service line adjusted and shall cover the cost of all materials, transportation, labor, equipment, excavation, sheeting and shoring, adjustment of service line, tracer wire and splices, chlorine for disinfection, disinfection, backfilling, backfill material, disposal of unsuitable backfill materials, tamping, testing, densities, dewatering, trench stabilization, clean-up, restoration, and all work and materials necessary to adjust the service line except where such items are shown to be paid for under a separate Pay Item.

BB. Adjustment of Existing Water Valve Boxes to Grade

Adjustment of existing valve boxes shall be paid for in accordance with Section 611, at the unit price per each valve box adjusted to final grade and shall cover the cost of all materials, transportation, labor, equipment, excavation, sheeting and shoring, valve case and lid, trench adapter and operating nut extensions/reductions, tracer wire and splices, tracer wire riser and threaded plug, concrete pad, valve identification disc, backfilling, backfill material, disposal of unsuitable backfill materials, tamping, testing, densities, dewatering, trench stabilization, clean-up, restoration, and all work and materials necessary to adjust the valve box.

CC. Adjustment of Blow-off Assembly

Adjustment of existing blow-off assemblies shall be paid for at the unit price per each blow-off adjusted to final grade and shall cover the cost of all materials, transportation, labor, equipment, excavation, sheeting and shoring, valve case and lid, trench adapter and operating nut extensions/reductions, tracer wire and splices, tracer wire riser and threaded plug, piping, concrete pad or collar, valve identification disc, chlorine for disinfection, disinfection, backfilling, backfill material, disposal of unsuitable backfill materials, tamping, testing, densities, dewatering, trench stabilization, clean-up, restoration, and all work and materials necessary to adjust the blow-off assembly.

DD. Adjustment of Existing Water Meter Boxes to Grade

Adjustment of existing meter boxes shall be paid for at the unit price per each meter box adjusted to finished grade and shall cover the cost of all materials, transportation, labor, equipment, excavation, sheeting and shoring, adjustment of water meter box to final grade, protection of existing utilities, backfilling, backfill material, disposal of unsuitable backfill materials, tamping, testing, densities, dewatering, trench stabilization, clean-up, restoration, and all work and materials necessary to adjust the water meter box.

EE. Adjustment of Backflow Preventer

Adjustment of existing backflow preventers shall be paid for at the unit price per each backflow preventer adjusted to finished grade and shall cover the cost of all materials, transportation, labor, equipment, excavation, sheeting and shoring, adjustment of backflow preventer to final grade, adjustment of backflow preventer vault to final grade, protection of existing utilities, backfilling, backfill material, disposal of unsuitable backfill materials, tamping, testing, densities, dewatering, trench stabilization, clean-up, restoration, and all work and materials necessary to adjust the water meter box.

FF. Adjustment of Existing Fire Hydrant Assembly to Grade

Adjustment of existing fire hydrants shall be paid for, at the unit price per each hydrant adjusted to finished grade and shall cover the cost of all materials, transportation, labor, equipment, excavation, sheeting and shoring, adjustment of hydrant, protection of existing utilities, chlorine for disinfection, disinfection, backfilling, backfill material, disposal of unsuitable backfill materials, tamping, testing, densities, dewatering, trench stabilization, clean-up, restoration, and all work and materials necessary to adjust the hydrant.

GG. Removal of Water Valve and Box

Removal of water valves shall be paid for at the unit price per each valve removed and shall cover the cost for all
Section 670—Water Distribution System

materials, transportation, labor, equipment, excavation, sheet and shoring, removal of existing water valve and box, protection of existing utilities, backfilling, backfill material, disposal of unsuitable backfill materials, tamping, testing, densities, dewatering, trench stabilization, clean-up, restoration, storage and delivery of removed valves identified to be salvaged, and all work necessary to remove the valve and box.

HH. Removal of Water Meter and Box

Removal of water meters shall be paid for at the unit price per each meter removed and shall cover the cost for all materials, transportation, labor, equipment, excavation, sheet and shoring, removal of existing water meter and box, protection of existing utilities, backfilling, backfill material, disposal of unsuitable backfill materials, tamping, testing, densities, dewatering, trench stabilization, clean-up, restoration, storage and delivery of removed meters and boxes identified to be salvaged, and all work necessary to remove the meter.

II. Removal of Fire Hydrant Assembly

Removal of fire hydrant assemblies shall be paid for at the unit price per each hydrant assembly removed and shall cover the cost for all materials, transportation, labor, equipment, excavation, sheeting and shoring, removal of existing fire hydrant assembly, protection of existing utilities, backfilling, backfill material, disposal of unsuitable backfill materials, tamping, testing, densities, dewatering, trench stabilization, clean-up, restoration, storage and delivery of removed hydrants identified to be salvaged, and all work necessary to remove the hydrant.

JJ. Removal of Air Release Valve

Removal of air release valves shall be paid for at the unit price per each air release valve removed and shall cover the cost for all materials, transportation, labor, equipment, excavation, sheeting and shoring, removal of air release valve assemblies, piping, concrete manholes or vaults, and fabricated enclosures, backfilling, backfill materials, disposal of unsuitable backfill materials, tamping, testing, densities, dewatering, trench stabilization, clean-up, restoration, storage and delivery of air release valves identified to be salvaged, and all work necessary to remove the air release valve.

KK. Removal of Backflow Prevention Devices

Removal of backflow prevention devices shall be paid for at the unit price per each backflow preventer removed and shall cover the cost for all materials, transportation, labor, equipment, excavation, sheet and shoring, removal of existing backflow preventer and vault, protection of existing utilities, backfilling, backfill material, disposal of unsuitable backfill materials, tamping, testing, densities, dewatering, trench stabilization, clean-up, restoration, storage and delivery of removed backflow preventers identified to be salvaged, and all work necessary to remove the backflow preventers.

LL. Concrete Thrust Blocks

Concrete thrust blocks shall be paid for at the unit price per cubic yard of concrete complete in place as indicated in Section 500 and shall cover the cost of all materials, transportation, labor, equipment, excavation, sheeting and shoring, concrete, forming, reinforcement, protection of existing utilities, backfilling, backfill material, disposal of unsuitable backfill materials, tamping, testing, densities, dewatering, trench stabilization, clean-up, restoration, and all work and materials necessary to install a complete thrust block. When Concrete Thrust Blocks is not shown as a pay item, include the cost of the work in the bid price for the appropriate item.

MM. Concrete Thrust Collars

Concrete thrust collars shall be paid for at the unit price per each size of thrust collar and shall cover the cost of all materials, transportation, labor, equipment, excavation, sheeting and shoring, reinforced concrete thrust collars, retainer glands, reinforcement, protection of existing utilities, backfilling, backfill material, disposal of unsuitable backfill materials, tamping, testing, densities, dewatering, trench stabilization, clean-up, restoration, and all work and materials necessary to install a complete thrust collar. When Concrete Thrust Collar is not shown as a pay item, include the cost of the work in the bid price for the appropriate item.

NN. Removal of Water Main

Removal of water mains shall be paid for at the unit price per linear foot of the size of water main to be removed in
Section 670—Water Distribution System

In accordance with Section 610 and shall cover the cost for all materials, transportation, labor, equipment, excavation, sheeting and shoring, protection of existing utilities, backfilling, backfill material, disposal of unsuitable backfill materials, tamping, testing, densities, dewatering, trench stabilization, clean-up, bypass pumping (as required), restoration, and all work and materials necessary to locate, remove and dispose of the pipe and associated appurtenances. Unless indicated for removal in a separate Pay Item, appurtenances to be removed shall include but not be limited to fittings, isolation valves, air release valves, valve boxes, blow-offs, steel casings, casing spacers, fire hydrant assemblies, water service lines, water meter boxes, thrust blocks, and concrete. All such surplus items shall become the property of the Contractor unless specified to be salvaged by the Utility Owner.

OO. Cut and Plug Existing Water Main

Cutting and plugging of existing water mains shall be paid for at the unit price per each installation and shall cover all materials, transportation, labor, equipment, excavation, sheeting and shoring, protection of existing utilities, backfilling, backfill material, disposal of unsuitable backfill materials, tamping, testing, densities, dewatering, trench stabilization, clean-up, restoration, and all work and materials necessary to cut and plug existing water mains, except where such items are shown to be paid for under a separate Pay Item.

PP. Line Stops

Line stops shall be paid for at the unit price per each size line stop installed and shall cover the cost for all materials, transportation, labor, equipment, excavation, sheeting and shoring, installation of the line stop assemblies, valves, valve boxes, fittings, restraints, protection of existing utilities, chlorine for disinfection, disinfection, sampling points, backfilling, backfill material, disposal of unsuitable backfill materials, tamping, testing, densities, utility crossings, dewatering, trench stabilization, clean-up, restoration, and all work and materials necessary to install the gate valve and place it in service.

QQ. Flowable Fill

Flowable fill shall be paid for at the unit price per cubic yard of flowable fill complete in place as indicated in Section 600 and shall cover the cost for all materials, transportation, labor, equipment, excavation, sheeting and shoring, flushing, plugging air release valves and service connections, installation of flowable fill, protection of existing utilities, backfilling, backfill material, disposal of unsuitable backfill materials, tamping, testing, densities, utility crossings, dewatering, trench stabilization, clean-up, restoration, and all work and materials necessary to install the gate valve and place it in service. When flowable fill is not shown as a pay item, include the cost of the work in the bid price for the appropriate item.

RR. Insertion Valve

Insertion valves shall be paid for at the unit price per each size valve inserted and shall cover the cost for all materials, transportation, labor, equipment, excavation, sheeting and shoring, installation of the valve, valve boxes, fittings, restraints, concrete pad or collar, valve identification disc, valve marker, polyethylene encasement, protection of existing utilities, chlorine for disinfection, disinfection, sampling points, backfilling, backfill material, disposal of unsuitable backfill materials, tamping, testing, densities, dewatering, trench stabilization, clean-up, restoration, and all work and materials necessary to install the insertion valve and place it in service.

SS. Three-Dimensional (3D) Survey

Three-dimensional survey cost will be included in the overall pipe measurement and no separate payment for this work will be made, and it shall cover the costs for all non-destructive methods of locating installed utilities and associated electronic deliverables per Utility Owner specifications.

Payment will be made under:

<table>
<thead>
<tr>
<th>Item No. 670</th>
<th>Water Main in (mm)</th>
<th>Per linear foot (meter)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item No. 670</td>
<td>Gate Valve in (mm)</td>
<td>Per each</td>
</tr>
<tr>
<td>Item No. 670</td>
<td>Tapping Sleeve and Valve Assembly in (mm) x in (mm)</td>
<td>Per each</td>
</tr>
</tbody>
</table>
## Section 670—Water Distribution System

<table>
<thead>
<tr>
<th>Item No. 670</th>
<th>Description</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item No. 670</td>
<td>Fire Hydrant</td>
<td>Per each</td>
</tr>
<tr>
<td>Item No. 670</td>
<td>Water Service Line____ in (mm)</td>
<td>Per linear foot (meter)</td>
</tr>
<tr>
<td>Item No. 670</td>
<td>Relocate Existing Fire Hydrant</td>
<td>Per each</td>
</tr>
<tr>
<td>Item No. 670</td>
<td>Relocate Existing Air Release Valve Assembly</td>
<td>Per each</td>
</tr>
<tr>
<td>Item No. 670</td>
<td>Relocate Existing Water Valve including Box</td>
<td>Per each</td>
</tr>
<tr>
<td>Item No. 670</td>
<td>Relocate Existing Water Meter including Box</td>
<td>Per each</td>
</tr>
<tr>
<td>Item No. 670</td>
<td>Adjust Water Service Line to Grade</td>
<td>Per linear foot (meter)</td>
</tr>
<tr>
<td>Item No. 670</td>
<td>Remove Existing Water Meter including Box</td>
<td>Per each</td>
</tr>
<tr>
<td>Item No. 670</td>
<td>Steel casing____ in (mm)</td>
<td>Per linear foot (meter)</td>
</tr>
<tr>
<td>Item No. 670</td>
<td>Butterfly valve____ in (mm)</td>
<td>Per each</td>
</tr>
<tr>
<td>Item No. 670</td>
<td>Double strap saddle____ in (mm) x ____ in (mm)</td>
<td>Per each</td>
</tr>
<tr>
<td>Item No. 670</td>
<td>Tapping Valve, ____ in (mm)</td>
<td>Per each</td>
</tr>
<tr>
<td>Item No. 670</td>
<td>Air Release Valve Assembly____ in (mm)</td>
<td>Per each</td>
</tr>
<tr>
<td>Item No. 670</td>
<td>Water Meter, ____ in</td>
<td>Per each</td>
</tr>
<tr>
<td>Item No. 670</td>
<td>Insertion Valve, ____ in</td>
<td>Per each</td>
</tr>
<tr>
<td>Item No. 670</td>
<td>Line Stop____ in (mm)</td>
<td>Per each</td>
</tr>
<tr>
<td>Item No. 670</td>
<td>Cut and Plug Existing Water Main</td>
<td>Per each</td>
</tr>
<tr>
<td>Item No. 670</td>
<td>Blow-Off Assembly, Complete</td>
<td>Per each</td>
</tr>
<tr>
<td>Item No. 670</td>
<td>Pressure Reducing/Sustaining Valve</td>
<td>Per each</td>
</tr>
<tr>
<td>Item No. 670</td>
<td>Backflow Prevention Assembly</td>
<td>Per each</td>
</tr>
<tr>
<td>Item No. 670</td>
<td>Concrete Thrust Collar, ____ in</td>
<td>Per each</td>
</tr>
<tr>
<td>Item No. 670</td>
<td>Relocate Backflow Prevention Assembly</td>
<td>Per each</td>
</tr>
<tr>
<td>Item No. 670</td>
<td>Relocate Existing Water Meter, including Bypass &amp; Vault____ in (mm)</td>
<td>Per each</td>
</tr>
<tr>
<td>Item No. 670</td>
<td>Relocate Pressure Reducing/Sustaining Valve</td>
<td>Per each</td>
</tr>
<tr>
<td>Item No. 670</td>
<td>Adjust Blow-off Assembly</td>
<td>Per each</td>
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<td>Adjust Fire Hydrant Assembly</td>
<td>Per each</td>
</tr>
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<td>Item No. 670</td>
<td>Adjust Backflow Preventer</td>
<td>Per each</td>
</tr>
<tr>
<td>Item No. 670</td>
<td>Remove Existing Water Valve, including Box</td>
<td>Per each</td>
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<td>Item No. 670</td>
<td>Remove Existing Air Release Valve</td>
<td>Per each</td>
</tr>
</tbody>
</table>

### 670.5.01 Adjustments

General Provisions 101 through 150.
Add the following:

950.1 General Description

This Work consists of furnishing materials, labor, tools, equipment, and other items necessary for the installation, relocation, and adjustment of underground or direct buried telecommunication facilities in accordance with the Project Plans, Telecommunication Plans, and Specifications. This work includes the partial installation of telecommunication facilities on bridge structures when specified in the Plans. This Work does not include aerial telecommunication facilities and any splicing work, whether underground or aerial. This work does not include the placing or pulling of any wire or fiber optic cable through conduit, whether underground, aerial, or bridge attachment.

950.1.01 Definitions

General Provisions 101 through 150

Whenever the terms “Company” or “BellSouth” or “AT&T” are used in this Special Provision and its related documents, they mean American Telephone & Telegraph, its subsidiaries, successors and/or assigns.

Whenever the term “Plan” is used in this Special Provision and related documents, this includes the Telecommunication Plans.

The term “Contract Coordinator” means the Company’s authorized individual having the authority to give instructions pertaining to the Work. The Contract Coordinator has authority to approve or reject the Work and otherwise represent the Company. The Contract Coordinator is not authorized to revoke, alter, enlarge, relax, or release any requirements of the Contract, Plans, and Specifications nor will they act as an agent for the Contractor. Ensure Contract Coordinator has access to all of the Work for inspection and testing and is invited to participate in any project meeting where Telecommunication Facilities may be discussed.

950.1.02 Related References
Section 950 - Telecommunication Facilities

General Provisions 101 through 150

A. Standard Specifications

Section 107 – Legal Regulations and Responsibility to the Public
Section 201 - Clearing and Grubbing
Section 205 - Roadway Excavation
Section 207 - Excavation and Backfill for Minor Structures
Section 208 - Embankments
Section 209 - Subgrade Construction
Section 310 - Graded Aggregate Construction
Section 400 - Hot Mix Asphaltic Concrete Construction
Section 441 - Miscellaneous Concrete
Section 444 – Sawed Joints in Existing Pavements
Section 500 - Concrete Structures
Section 810 – Roadway Materials
Section 852 - Miscellaneous Steel Materials
Section 861 - Piling and Round Timber
Section 863 - Preservative Treatment of Timber Products

B. Related Documents


Obtain from the Institute of Electrical and Electronics Engineers at:
http://www.ieee.org/portal/site/iportals/

2. AT&T telecommunication construction standards/details/specifications

Obtain AT&T’s telecommunication construction standards/details/specifications from:
AT&T Georgia

If there is a conflict or discrepancy between the Specifications and the telecommunication standards/details/specifications or the National Electric Safety Code, perform the Work in accordance with the Company’s telecommunication construction standards/details/specifications and National Electric Safety Code, current editions. If any of the Company’s telecommunication construction
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standards/details/specifications and National Electric Safety Codes are revised after Notice to Contractors date, perform the Work specified in the Plans and Specifications using the revised telecommunication construction standards/details/specifications and National Electric Safety Code. If revisions to the Company’s telecommunication construction standards/details/specifications and National Electric Safety Codes are dated on or after the letting date shown on the bid proposal, notify the Engineer in writing of such revisions.

950.1.03 Submittals

General Provisions 101 through 150

A. Completion Letter and As-Built Documentation

Provide no later than 30 days after the completion of the work a Completion Letter and As-Built Documentation to both the Engineer and the Contract Coordinator consisting of the following information.

1. Include in the Completion Letter the date all telecommunication pay items are completed and ready to be turned over to the Company. Also, include a detailed estimate of quantities in place and explanation of any deviations or overruns.

2. Provide As-Built Documentation of the in-place and accepted telecommunication facilities. Documentation shall consist of two sets of full size plans and electronic files in the form of a Bentley MicroStation file using the same version and format in which the Telecommunication Plans were created.

950.2 Materials

A. Underground Telecommunication Facilities

Provide any materials required for the construction of proposed telecommunication facilities shown on the Plans but not furnished by the Company. Furnish for the completion of the Work all materials, tools, equipment, and labor in conformance with the requirements and standards set forth in the telecommunication construction standards/details/specifications, current edition. When required by the Plans, transfer all existing materials supplied by the Company to the required locations as specified. Replace in-kind any existing material damaged or lost during transfer.

950.2.01 Delivery, Storage, and Handling

General Provisions 101 through 150

Coordinate with the Contract Coordinator to ensure all required materials for the Work are from sources approved by AT&T. Follow any delivery, storage and handling procedures set forth in the telecommunication construction standards/details/specifications, current edition.

950.3 Construction Requirements
Section 950 - Telecommunication Facilities

950.3.01 Personnel

General Provisions 101 through 150

Contractors or Subcontractors performing work consisting of the construction and installation of telecommunication facilities must be prequalified with the Company and registered with the Department.

950.3.02 Equipment

General Provisions 101 through 150

Ensure all equipment used is in conformance with the requirements and standards set forth in the Company’s telecommunication construction standards/details/specifications, current edition. Obtain prior approval from the Engineer before starting Work on specialty items such as boring equipment and others of similar complexity.

950.3.03 Preparation

General Provisions 101 through 150


950.3.04 Fabrication

General Provisions 101 through 150

Ensure fabrication procedures and requirements conform to those set forth in the Company’s telecommunication construction standards/details/specifications, current edition. Submit shop drawings to the Engineer and Contract Coordinator for any items requiring fabrication. Obtain approval from the Engineer and Contract Coordinator prior to ordering materials.

950.3.05 Construction

Review the Plans to ensure all items required for the Work are included in the price bid for each telecommunication bid item. Identify any material required to complete the Work not shown in the Plans. Communicate with the Contract Coordinator to ensure AT&T is given 30 (thirty) calendar days notice for AT&T’s portion of the Work.

A. Permission to Enter Private Property

Comply with Section 107—Legal Regulations and Responsibility to the Public.

Through an agreement between the Department and the Company; the Contractor is given the permission to enter upon private properties found outside the project’s construction limits. This permission is granted for the sole purpose of activities relating to the installation and/or adjustments of telecommunication facilities only and is limited to the area of existing easements obtained by the Company. Such permission to enter upon
Section 950 - Telecommunication Facilities

Private properties is temporary and such rights commence upon project award and automatically expire upon completion and project final acceptance by the Department.

In all cases where it is necessary to enter upon private property; take sole responsibility for and minimize any disruptions to personal property in the commencement of such work thereof. Additionally, ensure compliance to the following restrictions and requirements:

1. Limit all Work to the installation, relocation, or replacement of telecommunication facilities; and, Work necessary to restore each private property in compliance with subsection 950.3.05.A.6.

2. Notify the Engineer, private property owner, and resident(s) 72 hours before commencing Work on said private property.

3. Ensure only vehicles and equipment required for the Work are allowed on any private property.

4. Do not store any materials, vehicles, or equipment on any private property longer than the duration required to perform the Work.

5. Do not use any private property as an on-site detour or vehicle path.

6. Immediately following any construction located on private property, restore all areas of the same parcel to a condition substantially the same as existed immediately prior to any such disturbances, including without limitation, any and all necessary repairs, and replacement of grassing, landscaping and pavement which may be removed and excavated by the Contractor. Ensure all necessary repairs are made to restore the original contours and re-establish the ground cover to control erosion.

B. Customer Notification Requirements

Follow all customer notification requirements as provided by the Company and obtain approval from the Contract Coordinator prior to disrupting existing services required for the installation of the telecommunication facilities shown on the Plans.

C. Installation or Adjustment of Telecommunication Facilities

Follow all relevant procedures set forth in the Company’s telecommunication construction standards/details/specifications, current edition. Construct all proposed underground telecommunication facilities in accordance with the requirements set forth in the Plans and as instructed by the Contract Coordinator.

D. Excavating Trenches

Excavate trenches to the proper grade, depth, and width as follows:

1. Trench to Grade

   Ensure excavated trench bottoms are firm, free from boulders, and conform to the established grade.

   a. Backfill, according to Section 207, any part of the trench excavated below the established grade. Use Class I or Class II Soils (Section 810), and firmly compact the soil.
Section 950 - Telecommunication Facilities

b. Where the established grade of a trench is in rock, undercut the bottom of the trench by at least 6 in (150 mm), then backfill and compact according to Section 207.

c. Conduct blasting operations according to Subsection 107.12.

d. Excavate trenches under pavement to grade as follows:

1) To remove the pavement, cut it at least 12 in (300 mm) wider than each trench edge to provide solid bearing for the pavement edges when replaced. Remove the pavement according to Section 444, except no separate payment will be made for sawed joints.

2) Directional bore under existing sidewalks, curbs, gutters, and pavements according to subsection 950.3.05.E.

2. Minimum Trench Depth

Excavate trenches to provide at least 48 in (1.2 m) cover depth from the Work to the finished pavement surface, sidewalk, grass plot, etc. unless indicated otherwise on the Plans or by the Engineer.

If any part of a telecommunication facility is to be placed in or under a new embankment, finish the embankment to at least a 2 ft (600 mm) plane above the top of the proposed facility before excavating the trench.

3. Trench Width

Excavate trenches wide enough to allow proper installation of the Work.

E. Directional Boring

This Work consists of installing various sizes of bores by directional boring through whatever materials may be encountered.

Furnish, for the Engineer’s approval, a plan showing the proposed methods for the installation of horizontal directional bores. The Engineer will review the proposed installation plan within 10 working days of receipt by the Department. No directional boring Work will be allowed until the Contractor’s submitted plan is approved by the Engineer. Include the following detail in the plan, as a minimum:

1. List of projects completed by the company performing the boring operation, environment of installation (urban work, river crossing, freeway), diameter of product installation and length of bores. Include the name, address and phone number of an owner’s representative with knowledge of the performance of the Work. Provide at least five previously completed projects of similar scope as the boring Work included in this contract.

2. List of the Contractor’s key personnel with a resume of boring experience. The Department will be the sole judge of the qualifications of the foreman and the drill operators.

3. Location of all proposed boring entry and exit pits.

4. Proposed alignment of bore both horizontal and vertical. For the proposed alignment, maintain a minimum clearance of 18 inches (450 mm) or 2 times the diameter of the final product installation,
Section 950 - Telecommunication Facilities

whichever is greater, at any obstruction. Do not perform boring in select backfill areas such as at mechanically stabilized wall locations.

5. Proposed diameter of bore. This diameter is the diameter of the final product installation.

6. Proposed diameter of pilot borehole.

7. Proposed diameter of back reamer. Do not allow the diameter of the back reamer to exceed 1.5 times the diameter of the final product installation.

8. Proposed depth of cover. Ensure the depth of cover will be equal to or greater than 10 times the diameter of the final product installation. Under paved shoulders, maintain a minimum depth of cover of 4 feet (1.22 meters). Under travel lanes or outside of paved shoulders, maintain a minimum depth of cover of 8 feet (2.44 meters).

9. Evaluation of soil conditions to be encountered. A complete soil survey is not required. As a minimum, excavate the entrance and exit pits for the proposed bore and determine the nature of the material likely to be encountered. Base the drilling fluid composition on the evaluation of the materials encountered in the bore pit excavation.


11. Proposed drilling fluid pressure and flow rates.


13. Proposed pull back rate.

14. Type of tracking facilities.

Excavate suitable pits or trenches for the boring operation and for placing end joints or termination connectors of conduit when required. Securely sheet and brace pits or trenches where necessary to prevent caving. Where directional boring is required under railroads, highways, streets or other facilities, perform construction in a manner that will not interfere with the operation of the facility, and not weaken the roadbed or structure. Do not disturb or excavate any roadway pavement, subgrade, roadbed, paved shoulder, or unpaved median as part of the boring or conduit placing operation for any reason without written authorization by the Engineer.

In the above areas, unless otherwise authorized in writing by the Engineer, abandon in place any broken or damaged boring rod/stem, boring head (including transmitter/transponder locating heads and cutter heads), couplings (including back reaming, swivel or connector couplings), or any other material that cannot be retrieved as part of the pullback operation. Abandoned material will become the property of the Department. No additional payment for abandoned material will be made.

Continuously monitor the location and alignment of the pilot drill progress to insure compliance with the proposed installation alignment and to verify depth of the bore. Accomplish monitoring by manual plotting based on location and depth readings provided by the locating/tracking facilities or by computer generated bore logs which map the bore path based on information provided by the locating/tracking facilities. Obtain readings or plots on every drill rod and provide to the Engineer on a daily basis for as-built plans.
Monitor drilling fluids such as the pumping rate, pressures, viscosity and density during the pilot bore, back reaming, and/or conduit installation stages to ensure adequate removal of soil cuttings and to ensure the stability of the borehole is maintained. Do not allow drilling fluid pressures to exceed that which can be supported by the overburden (soil) pressure to prevent heaving or a hydraulic fracture of the soils. Contain excessive drilling fluids at the entry and exit points until recycled or removed from the site. Dispose of all drilling fluids in a manner acceptable to the appropriate local, state and federal regulations. The Work will be immediately suspended whenever drilling fluids seep to the surface other than in the boring entrance or exit pit. Propose a method to prevent further seepage and remove and dispose of any drilling fluid on the surface prior to resuming the boring operation.

To minimize heaving during pullback, determine the pullback rate to maximize the removal of soil cuttings and minimize compaction of the ground surrounding the borehole. Ensure the pullback rate minimizes overcutting of the borehole during the back reaming operation to ensure excessive voids are not created resulting in post installation settlement. Restore any surfaces damaged by the Work to their preconstruction conditions. All costs associated with the restoration are to be borne by the Contractor.

The distance the excavation extends beyond the end of the bore will depend upon the character of the excavated material. Do not exceed 2 feet (0.61 meters) in any case. If the character of the material being excavated makes it desirable, decrease the distance on instructions from the Engineer. Once the directional boring has commenced, insofar as practical, continue the operation without interruption. After the boring has been completed, immediately backfill the pits or trenches excavated to facilitate boring operations.

Proceed with the Work from a surface staging area provided for the boring equipment and workers. Obtain approval from the Engineer on the proposed location of the staging area. Bore the holes mechanically. Place excavated material near the top of the working pit and dispose of as required. Water or other fluids in connection with the boring operation will be permitted only to the extent necessary to lubricate cutting. Do not perform jetting.

Excavation will not be measured for payment.

In unconsolidated soil formations, a gel-forming colloidal drilling fluid consisting of at least 10% high grade carefully processed bentonite may be used to consolidate excavated material, seal the walls of the hole, and furnish lubrication for subsequent removal of material and immediate back reaming/installation of conduit. Continuously monitor and maintain the flow pressure on the drilling fluid at the minimal pressure required to place the fluid. In normal circumstances, do not exceed a flow pressure of 200 psi (1379 k Pa). At any time during boring operations, do not exceed a flow pressure of 500 psi (3448 k Pa). Remove all drilling fluid spoils from both ends of the bore and properly dispose of material at a properly permitted location.

Limit allowable variation from line and grade to a maximum of 2 percent.

Pressure grout any voids that develop during the installation operation and are determined by the Engineer to be detrimental to the Work with an approved mix.

Directional boring operations inherently include the risk of encountering below grade obstructions that begin to alter the bore direction. Should an obstruction be encountered, notify the Engineer immediately. Attempt to restore the bore alignment by performing a minimum of three attempts at each encountered obstruction with different corrective measures. Boring deeper or shallower (if minimum conduit depth can
Section 950 - Telecommunication Facilities

be maintained), moving the boring head to the right or left of the obstruction, or attempting to bore through the obstruction (if other than solid rock) are acceptable corrective measures to restore bore alignment. The Engineer may authorize a relocation of the bore if a suitable bore alignment cannot be restored.

F. Removals

Follow all relevant procedures set forth in the Telecommunication Plans or Company’s telecommunication construction standards/details/specifications, current edition. Remove all existing telecommunication facilities in accordance with the requirements set forth in the Plans and as instructed by the Contract Coordinator. Cutting of poles specified for removal or abandonment will not be permitted. Remove pole(s) and backfill void in accordance with Section 207. Backfill any voids remaining from the removal of underground facilities in accordance with Section 207. Replace, in-kind (material and depth), any voids remaining in roadway structures.

951.3.06 Quality Acceptance

A. Testing

Follow all relevant procedures set forth in the Telecommunication Plans or Company’s telecommunication construction standards/details/specifications, current edition. Ensure Contract Coordinator is present at all inspection and testing. Correct all deficiencies in the Work indicated by testing, inspecting, and as directed by the Engineer or Contract Coordinator.

B. Semi-Final Utility Inspection

When the contractor has finished the Telecommunication System Work, the Contractor may, by written notice, request that a semi-final utility inspection be made. The Engineer, along with the Contract Coordinator, will determine if the Telecommunication System Work is ready for semi-final utility inspection. The Engineer, in agreement with the Contract Coordinator, will have the final decision on when the Telecommunication System Work is complete and thereby ready for semi-final utility inspection. If all the Telecommunication System Work provided for and contemplated by the Contract is found to be complete to the Engineer’s satisfaction and all documents required in connection with the Telecommunication System Work has been submitted and accepted then, the Contractor may request transfer of the completed Telecommunication System Work to the Owner.

Once the new facilities are in service and accepted by the Owner, provide written correspondence notifying the Engineer and Contract Coordinator that utility location services will be the responsibility of said Owner.

Such partial acceptance shall in no way relieve the Contractor of the responsibility for satisfactory completion of the Contract, or for failure of any portion of the Telecommunication System Work prior to Final Acceptance of the Project.

950.3.07 Contractor Warranty and Maintenance

General Provisions 101 through 150

950.4 Measurement
**Section 950 - Telecommunication Facilities**

Installation and Adjustment of Telecommunication Facilities, and other items of Work in this Specification, in place, operational, and accepted, are measured for payment as follows:

**A. Installation of Telecommunication Facilities**

Installation is measured in linear feet for each type, size, and capacity of facility installed and accepted. The facility is measured along the center following the existing ground line or bridge deck grade from structure to structure through all equipment and hardware and includes the installation of any materials required by the Plans and Company’s telecommunication construction standards/details/specifications, current edition. Measurement will begin and end at existing pole structures, vault structures, splice point, or termination cabinet where the newly installed Work connects to the existing facility. All measurements will begin and terminate at the intersection of the structure and grade. Measurement for the portions of buried facilities that transition up pole structures to tie to the overhead facilities will not be made. There will be no compensation for replacement of damaged or lost materials. There will be no separate measurement and payment for the transfer of existing materials to new location. Include the costs of transferring materials in the costs for the installation of Telecommunication Facilities. Measurement of unsuccessful boring attempts will not be made. Successful directional bores are measured in linear feet for each size and capacity of bored facility installed and accepted.

Obtain measurements with electronic survey equipment and provide Engineer with printout of Installed Telecommunication Facilities indicating State Plane Coordinates and station numbers of each underground structure and pole structure and indicate distances between structures starting from the beginning of the Work (existing facility structure).

**B. Adjustment of Telecommunication Facilities**

Adjustment is measured in linear feet for each type, size, and capacity of facility adjusted. The facility is measured along the center following the existing ground line from structure to structure through all equipment and hardware and includes the installation of any materials required by the Plans and Company’s telecommunication construction standards/details/specifications, current edition. Measurement will begin and end at existing pole structures, vault structures, splice point, or termination cabinet where the newly installed Work connects to the existing facility. All measurements will begin and terminate at the intersection of the structure and grade. Measurement for the portions of buried facilities that transition up pole structures to tie to the overhead facilities will not be made. There will be no compensation for replacement of damaged or lost materials. There will be no separate measurement and payment for the transfer of existing materials to new location. Include the costs of transferring materials in the costs for the Adjustment of Telecommunication Facilities.

Obtain measurements with electronic survey equipment and provide Engineer with printout of Adjusted Telecommunication Facilities indicating State Plane Coordinates and station numbers of each underground structure and pole structure and indicate distances between structures starting from the beginning of the Work (existing facility structure).

**C. Installation of Telecommunication Facilities, Manholes**

Installation is measured per the number of each type and size of manhole installed.

**D. Material Credit**
Section 950 - Telecommunication Facilities

Material Credit is a dollar amount credited to the Department for the value of unused or remaining Company provided materials rejected by the Company as being damaged or destroyed or materials lost or stolen. The amount will be tabulated based on an itemized list from the Company of all Company provided materials and based on the unused material remaining from the Work that was not returned to the Company or was rejected by the Company.

950.4.01 Limits

General Provisions 101 through 150

950.5 Payment

The Contract Unit Price for each Item shall include all costs incidental to the construction of the Item according to the Plans and as specified in this Section. Payment for any Item listed below is full compensation for the Item or Items in place, operational, and accepted.

A. Installation of Telecommunications Facilities

Installation will be paid for at the contract unit price per linear foot for each type, size, and capacity of facility installed. Payment is full compensation for purchasing, handling, delivery, and storage of material and installation of material in accordance with the Plans. Payment is full compensation for all the necessary equipment and labor for installation, including all items necessary and items specified in the Plans. Payment is full compensation for the entire linear feet required to traverse, below grade, the portion of the project specified and to tie back to existing facilities. This includes items such as directional boring, conduit, hardware, and any other item(s) necessary to provide for an in place and accepted operational facility of the type, size, and capacity specified in the Plans.

B. Adjustment of Telecommunications Facilities

Adjustment will be paid for at the contract unit price per linear foot for each type, size, and capacity of facility adjusted. Payment is full compensation for purchasing, handling, delivery, and storage of material and installation of material in accordance with the Plans. Payment is full compensation for all the necessary equipment and labor for adjustment and installation, including all items necessary and items specified in the Plans. Payment is full compensation for the entire linear feet required to traverse, below grade, the portion of the project specified and to tie back to existing facilities. This includes items such as conduit, hardware, and any other item(s) necessary to provide for an in place and accepted operational facility of the type, size, and capacity specified in the Plans.

C. Installation of Telecommunication Facilities, Manholes

Installation will be paid for at the contract unit price per each for each type and size of manhole installed. Payment is full compensation for all the necessary material, equipment, and labor for the installation, including all items necessary and all items specified in the Plans.

D. Material Credit
Section 950 - Telecommunication Facilities

Material Credit is a dollar amount credited to the Department for the value of unused or remaining Company provided materials rejected by the Company as being damaged or destroyed or materials lost or stolen. The amount will be tabulated based on an itemized list from the Company of all Company provided materials and based on the unused material remaining from the Work that was not returned to the Company or was rejected by the Company.

Payment will be made under:

<table>
<thead>
<tr>
<th>Item No. 950</th>
<th>Installation of Telecommunication Facilities, Conduit, Concrete Encased - ____ in, ____ way</th>
<th>Per linear foot (meter)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item No. 950</td>
<td>Installation of Telecommunication Facilities, Conduit, Non-Concrete Encased - ____ in, ____ way</td>
<td>Per linear foot (meter)</td>
</tr>
<tr>
<td>Item No. 950</td>
<td>Installation of Telecommunication Facilities, Conduit, Directional Bore - ____ in, ____ way</td>
<td>Per linear foot (meter)</td>
</tr>
<tr>
<td>Item No. 950</td>
<td>Installation of Telecommunication Facilities, Conduit, Bridge Attachment - ____ in, ____ way</td>
<td>Per linear foot (meter)</td>
</tr>
<tr>
<td>Item No. 950</td>
<td>Adjustment of Telecommunication Facilities, Conduit, Concrete Encased - ____ in, ____ way</td>
<td>Per linear foot (meter)</td>
</tr>
<tr>
<td>Item No. 950</td>
<td>Adjustment of Telecommunication Facilities, Conduit, Non-Concrete Encased - ____ in, ____ way</td>
<td>Per linear foot (meter)</td>
</tr>
<tr>
<td>Item No. 950</td>
<td>Installation of Telecommunication Facilities, Copper Twisted Pair Cable, Direct Burial - ____ in</td>
<td>Per linear foot (meter)</td>
</tr>
<tr>
<td>Item No. 950</td>
<td>Installation of Telecommunication Facilities, Fiber Optic Cable, Direct Burial - ____ in</td>
<td>Per linear foot (meter)</td>
</tr>
<tr>
<td>Item No. 950</td>
<td>Installation of Telecommunication Facilities, Precast Manhole – Type 1 – Class 1</td>
<td>Each</td>
</tr>
<tr>
<td>Item No. 950</td>
<td>Installation of Telecommunication Facilities, Cast-in-place Manhole – Type 1 – Class 1</td>
<td>Each</td>
</tr>
<tr>
<td>Item No. 950</td>
<td>Telecommunication Facilities, Material Credit</td>
<td>$</td>
</tr>
</tbody>
</table>

950.5.01 Adjustments

General Provisions 101 through 150

Buy America Language for Utility Agreements

2013-11-19

In accordance with the BUY AMERICA requirements of the Federal regulations (23 U.S.C. 313 and 23 CFR 635.410) all manufacturing processes for steel and iron products or predominantly of steel or iron (at
Section 950 - Telecommunication Facilities

least 90% steel or iron content) furnished for permanent incorporation into the work on this project shall occur in the United States. The only exception to this requirement is the production of pig iron and the processing, pelletizing and reduction of iron ore, which may occur in another country. Other than these exceptions, all melting, rolling, extruding, machining, bending, grinding, drilling, coating, etc. must occur in the United States.

(a) Products of steel include, but are not limited to, such products as structural steel piles, reinforcing steel, structural plate, steel culverts, guardrail, steel supports for signs, signals and luminaires, and cable wire/strand. Products of iron include, but are not limited to, such products as cast iron frames and grates and ductile iron pipe. Coatings include, but are not limited to, the applications of epoxy, galvanizing and paint. The coating material is not limited to this clause, only the application process.

(b) A Certificate of Compliance shall be furnished for steel and iron products as part of the backup information with the billing. Records to be maintained by the RAILROAD/UTILITIES and the DEPARTMENT for this certification shall include a signed mill test report and/or a signed certification by a supplier, distributor, fabricator, or manufacturer that has handled the steel or iron product affirming that every process, including the application of a coating, performed on the steel or iron product has been carried out in the United States of America, except as allowed by this Section. The lack of these certifications will be justification for rejection of the steel and/or iron product or nonpayment of the work.

(c) The requirements of said law and regulations do not prevent the use of miscellaneous steel or iron components, subcomponents and hardware necessary to encase, assemble and construct the above products, manufactured products that are not predominantly steel or iron or a minimal use of foreign steel and iron materials if the cost of such materials used does not exceed one-tenth of one percent (0.1%) of the total contract price or $2,500.00, whichever is greater.

Office of Utilities
Add the following:

951.1 General Description
This Work consists of furnishing labor, tools, equipment, and other items necessary for the installation, relocation, and adjustment of overhead and underground Cable Television Systems in accordance with the Project Plans, Owner Standards/Details/Specifications and Related Documents, and Specifications.

951.1.01 Definitions
General Provisions 101 through 150
Whenever the terms “Owner” or “Comcast” are used in this Special Provision and its related documents, they mean Comcast Cable Communications, Inc., its subsidiaries, successors and/or assigns.
Whenever the term “Plans” is used in this Special Provision and related documents, this includes the Cable Relocation Plans.
The term “Owner Project Manager” means the Owner’s authorized individual having the authority to give instructions pertaining to the Work. The Owner Project Manager has authority to approve or reject the Work and otherwise represent the Owner. The Owner Project Manager is not authorized to revoke, alter, enlarge, relax, or release any requirements of the Contract, Plans, and Specifications nor will they act as an agent for the Contractor. Ensure Owner Project Manager has access to all of the Work for inspection and testing and is invited to participate in any project meeting where Cable Television Systems may be discussed.

951.1.02 Related References
General Provisions 101 through 150
A. Standard Specifications
Section 107-Legal Regulations and Responsibility to the Public
Section 201-Clearing and Grubbing
Section 205-Roadway Excavation
Section 207-Excavation and Backfill for Minor Structures
Section 208-Embankments
Section 951 – Cable Systems

Section 209-Subgrade Construction
Section 310-Graded Aggregate Construction
Section 400-Hot Mix Asphaltic Concrete Construction
Section 441-Miscellaneous Concrete
Section 444-Sawed Joints in Existing Pavements
Section 500-Concrete Structures
Section 810-Roadway Materials
Section 852-Miscellaneous Steel Materials
Section 861-Piling and Round Timber
Section 863-Preservative Treatment of Timber Products

B. Owner Standards/Details/Specifications and Related Documents

1. Comcast Notice to Proceed (NTP)
2. Comcast Scheduled Maintenance Document (SMR/SM)
3. Comcast Post Construction Inspection Report/Corrective Action List
   Available from the Institute of Electrical and Electronics Engineers at:
   http://www.ieee.org/portal/site/iportals/
7. Society of Cable Television Engineers, Cable Television Construction Standards, current edition

If there is a conflict or discrepancy between the Specifications and the Owner Standards/Details/Specifications and Related Documents, perform the Work in accordance with the Owner Standards/Details/Specifications and Related Documents, current editions. If any of the Owner Standards/Details/Specifications and Related Documents are revised after Notice to Contractors date, perform the Work specified in the Plans and Specifications using the revised Owner Standards/Details/Specifications and Related Documents. If revisions to the Owner Standards/Details/Specifications and Related Documents are dated on or after the letting date shown on the bid proposal, notify the Engineer in writing of such revisions.

951.1.03 Submittals

General Provisions 101 through 150

Provide submittals in accordance with Comcast Overhead and Underground Cable Construction Standards, current published edition.

A. Completion Letter and As-Built Documentation

Provide no later than thirty (30) calendar days after the completion of the work a Completion Letter and As-Built Documentation to both the Engineer and the Owner Project Manager consisting of the following information.
Section 951 – Cable Systems

1. Include in the Completion Letter the date all cable television system pay items are completed and ready to be turned over to the Owner. Also, include a detailed estimate of quantities in place and explanation of any deviations or overruns.

2. Provide As-Built Documentation of the in-place and accepted cable television system. Documentation shall consist of two sets of full size plans and electronic files in the form of an AutoCAD version 2011 file or the same version and format in which the Cable Television System Plans were created.

951.2 Materials

A. Overhead and Underground Cable Television System

Provide any materials required for the construction of proposed cable television system shown on the Plans but not furnished by the Owner. Furnish for the completion of the Work all materials, tools, equipment, and labor in conformance with the Plans and current edition of the Owner Standards/Details/Specifications and Related Documents. When required by the Plans or Owner Standards/Details/Specifications and Related Documents, transfer all existing materials to the required locations as specified. Replace in-kind any existing material damaged during transfer.

951.2.01 Delivery, Storage, and Handling

Coordinate with the Owner Project Manager and Owner representative listed below to ensure all necessary materials are available for installation as required on the Plans, including the roadway staging plans. Follow any delivery, storage and handling procedures set forth in the Owner Standards/Details/Specifications and Related Documents. Coordinate with the Owner to take delivery of required material, load required material, transport all required material to the project, and properly store the material within the project limits or at Owner approved locations off the project limits. Return or dispose of all unused and remaining material as specified in subsection 951.3.05.H.

A bill of material will be provided by the Owner to the Contractor. Provide the Engineer with a copy of the bill of materials each time receipt and delivery of materials is made for the Project. Document all material received from the Owner and all material returned to the Owner. The Engineer and Owner Project Manager will be present when the contractor takes delivery from the Owner and when the Contractor returns material back to the Owner. With the Contractor, the Engineer and Owner Project Manager will verify materials to ensure all material delivered are documented, verified, and acknowledged in writing by all parties. The Contractor is responsible for all materials from the time of delivery from the Owner to the return of remaining materials to the Owner or disposal. The Owner Project Manager will verify and document all in place material and will notify the Engineer of any discrepancies.

951.3 Construction Requirements

951.3.01 Personnel

Contractors or Subcontractors performing work consisting of the construction and installation of cable television systems must be prequalified with the Owner and registered with the Department.

951.3.02 Equipment

General Provisions 101 through 150
Section 951 – Cable Systems

Ensure all equipment used is in conformance with the requirements and standards set forth in the Owner Standards/Details/Specifications and Related Documents. Obtain prior approval from the Engineer and Owner Project Manager before starting work on specialty items such as fiber splicing equipment, boring equipment and others of similar complexity.

951.3.03 Preparation
General Provisions 101 through 150

Follow all preparation procedures set forth in the documents referenced in the Owner Standards/Details/Specifications and Related Documents. Perform necessary preliminary engineering, field engineering, survey, and construction staking and layout for the installation of the specified Cable Television System.

951.3.04 Fabrication
General Provisions 101 through 150

Ensure fabrication procedures and requirements conform to those set forth in the current edition of the Owner Standards/Details/Specifications and Related Documents. Submit shop drawings to the Engineer and Owner Project Manager for any items requiring fabrication. Obtain approval from the Engineer and Owner Project Manager prior to ordering materials.

951.3.05 Construction

Review the Plans and Owner Standards/Details/Specifications and Related Documents to ensure all items required for the Work are included in the price bid for each Cable Television System bid item. Provide a detailed list of materials required to complete the Work to the Engineer and Owner Project Manager prior to ordering and taking delivery from Comcast. In the required detailed list of materials, identify any material required to complete the Work not shown in the Plans. Communicate with the Owner Project Manager to insure the Owner is given 30 (thirty) calendar days notice for the Owner’s portion of the Work.

A. Permission to Enter Private Property

Comply with Section 107—Legal Regulations and Responsibility to the Public.

Through an agreement between the Department and the Owner; the Contractor is given the permission to enter upon private properties found outside the project’s construction limits. This permission is granted for the sole purpose of activities relating to the installation and/or adjustments of Cable Television Systems only and is limited to the area of existing easements obtained by the Owner. Such permission to enter upon private properties is temporary and such rights commence upon project award and automatically expire upon completion and project final acceptance by the Department.

In all cases where it is necessary to enter upon private property; take sole responsibility for and minimize any disruptions to personal property in the commencement of such work thereof. Additionally, comply with the following restrictions and requirements:

1. Limit all activities to the installation, relocation, or replacement of Cable Television facilities; and, work necessary to restore each private property as required in subsection 951.3.05.A.6.
2. Notify the Engineer, the private property owner and resident(s) 72 hours before commencing Work on said private property.
3. Ensure only vehicles and equipment required for the Work are allowed on any private property.
Section 951 – Cable Systems

4. Do not store any materials, vehicles, or equipment on any private property longer than the duration required to perform the Work.

5. Do not use any private property as an on-site detour or vehicle path.

6. Immediately following any construction located on private property, restore all areas of the same parcel to a condition substantially the same as existed immediately prior to any such disturbances, including without limitation, any and all necessary repairs, and replacement of grassing, landscaping and pavement which may be removed and excavated by the Contractor. Ensure all necessary repairs are made to restore the original contours and re-establish the ground cover to control erosion.

B. Customer Notification Requirements

Follow all customer notification requirements as provided by the Owner and obtain approval from the Owner Project Manager prior to disrupting existing services required for the installation of the Cable Television Systems shown on the Plans.

C. Installation of Cable Television Systems

Follow all relevant procedures set forth in the current editions of the Owner Standards/Details/Specifications and Related Documents. Construct all temporary and proposed Cable Television Systems in accordance with the requirements set forth in the Contract, current editions of the Owner Standards/Details/Specifications and Related Documents, and as instructed by the Owner Project Manager.

D. Excavating Trenches

Excavate trenches to the proper grade, depth, and width as follows:

1. Trench to Grade
   
   Ensure excavated trench bottoms are firm, free from boulders, and conform to the established grade.

   a. Backfill, according to Section 207, any part of the trench excavated below the established grade. Use Class I or Class II Soils (Section 810), and firmly compact the soil.

   b. Where the established grade of a trench is in rock, undercut the bottom of the trench by at least 6 in (150 mm), then backfill and compact according to Section 207.

   c. Conduct blasting operations according to Subsection 107.12.

   d. Excavate trenches under pavement to grade as follows:

      1) To remove the pavement, cut it at least 12 in (300 mm) wider than each trench edge to provide solid bearing for the pavement edges when replaced. Remove the pavement according to Section 444, except no separate payment will be made for sawed joints.

      2) Directional bore under existing sidewalks, curbs, gutters, and pavements according to subsection 951.3.05.E

2. Minimum Trench Depth

Excavate trenches to provide at least 48 in (1.2 m) cover depth from the Work to the finished pavement surface, sidewalk, grass plot, etc. unless indicated otherwise on the Plans or by the Engineer.

If any part of a Cable Television System is to be placed in or under a new embankment, finish the embankment to at least a 2 ft (600 mm) plane above the top of the proposed facility before excavating the trench.
Section 951 – Cable Systems

3. Trench Width
   Excavate trenches wide enough to allow proper installation of the Work.

E. Directional Boring

This Work consists of installing various sizes of bores by directional boring through whatever materials may be encountered.

Furnish, for the Engineer’s approval, a plan showing the proposed methods for the installation of the horizontal directional bore. The Engineer will review the proposed installation plan within 10 working days of receipt by the Department. No directional boring Work will be allowed until the Contractor’s submitted plan is approved by the Engineer. Include the following detail in the plan, as a minimum:

1. List of projects completed by the company performing the boring operation, environment of installation (urban work, river crossing, freeway), diameter of product installation and length of bores. Include the name, address and phone number of an owner’s representative with knowledge of the performance of the Work. Provide at least five previously completed projects of similar scope as the boring Work included in this contract.

2. List of the Contractor’s key personnel with a resume of boring experience. The Department will be the sole judge of the qualifications of the foreman and the drill operators.

3. Location of all proposed boring entry and exit pits.

4. Proposed alignment of bore both horizontal and vertical. For the proposed alignment, maintain a minimum clearance of 18 inches (450 mm) or 2 times the diameter of the final product installation, whichever is greater, at any obstruction. Do not perform boring in select backfill areas such as at mechanically stabilized wall locations.

5. Proposed diameter of bore. This diameter is the diameter of the final product installation.

6. Proposed diameter of pilot borehole.

7. Proposed diameter of back reamer. Do not allow the diameter of the back reamer to exceed 1.5 times the diameter of the final product installation.

8. Proposed depth of cover. Ensure the depth of cover will be equal to or greater than 10 times the diameter of the final product installation. Under paved shoulders, maintain a minimum depth of cover of 4 feet (1.22 meters). Under travel lanes or outside of paved shoulders, maintain a minimum depth of cover of 8 feet (2.44 meters).

9. Evaluation of soil conditions to be encountered. A complete soil survey is not required. As a minimum, excavate the entrance and exit pits for the proposed bore and determine the nature of the material likely to be encountered. Base the drilling fluid composition on the evaluation of the materials encountered in the bore pit excavation.


11. Proposed drilling fluid pressure and flow rates.


13. Proposed pull back rate.

14. Type of tracking system.

Excavate suitable pits or trenches for the boring operation and for placing end joints or termination connectors of conduit when required. Securely sheet and brace pits or trenches where necessary to prevent
Section 951 – Cable Systems

caving. Where directional boring is required under railroads, highways, streets or other facilities, perform construction in a manner that will not interfere with the operation of the facility, and not weaken the roadbed or structure. Do not disturb or excavate any roadway pavement, subgrade, roadbed, paved shoulder, or unpaved median as part of the boring or pipe placing operation for any reason without written authorization by the Engineer.

In the above areas, unless otherwise authorized in writing by the Engineer, abandon in place any broken or damaged boring rod/stem, boring head (including transmitter/transponder locating heads and cutter heads), couplings (including back reaming, swivel or connector couplings), or any other material that cannot be retrieved as part of the pullback operation. Abandoned material will become the property of the Department. No additional payment for abandoned material will be made.

Continuously monitor the location and alignment of the pilot drill progress to insure compliance with the proposed installation alignment and to verify depth of the bore. Accomplish monitoring by manual plotting based on location and depth readings provided by the locating/tracking system or by computer generated bore logs which map the bore path based on information provided by the locating/tracking system. Obtain readings or plots on every drill rod and provide to the Engineer on a daily basis for as-built plans.

Monitor drilling fluids such as the pumping rate, pressures, viscosity and density during the pilot bore, back reaming, and/or pipe installation stages to ensure adequate removal of soil cuttings and to ensure the stability of the borehole is maintained. Do not allow drilling fluid pressures to exceed that which can be supported by the overburden (soil) pressure to prevent heaving or a hydraulic fracture of the soils. Contain excessive drilling fluids at the entry and exit points until recycled or removed from the site. Dispose of all drilling fluids in a manner acceptable to the appropriate local, state and federal regulations. The Work will be immediately suspended whenever drilling fluids seep to the surface other than in the boring entrance or exit pit. Propose a method to prevent further seepage and remove and dispose of any drilling fluid on the surface prior to resuming the boring operation.

To minimize heaving during pullback, determine the pullback rate to maximize the removal of soil cuttings and minimize compaction of the ground surrounding the borehole. Ensure the pullback rate minimizes over cutting of the borehole during the back reaming operation to ensure excessive voids are not created resulting in post installation settlement. Restore any surfaces damaged by the Work to their preconstruction conditions. All costs associated with the restoration are to be borne by the Contractor.

The distance the excavation extends beyond the end of the bore will depend upon the character of the excavated material. Do not exceed 2 feet (0.61 meters) in any case. If the character of the material being excavated makes it desirable, decrease the distance on instructions from the Engineer. Once the directional boring has commenced, insofar as practical, continue the operation without interruption. After the boring has been completed, immediately backfill the pits or trenches excavated to facilitate boring operations.

Proceed with the Work from a surface staging area provided for the boring equipment and workers. Obtain approval from the Engineer on the proposed location of the staging area. Bore the holes mechanically. Place excavated material near the top of the working pit and dispose of as required. Water or other fluids in connection with the boring operation will be permitted only to the extent necessary to lubricate cutting. Do not perform jetting.
Section 951 – Cable Systems

Excavation will not be measured for payment.

In unconsolidated soil formations, a gel-forming colloidal drilling fluid consisting of at least 10% high grade carefully processed bentonite may be used to consolidate excavated material, seal the walls of the hole, and furnish lubrication for subsequent removal of material and immediate back reaming/installation of conduit. Continuously monitor and maintain the flow pressure on the drilling fluid at the minimal pressure required to place the fluid. In normal circumstances, do not exceed a flow pressure of 200 psi (1379 k Pa). At any time during boring operations, do not exceed a flow pressure of 500 psi (3448 k Pa). Remove all drilling fluid spoils from both ends of the bore and properly dispose of material at a properly permitted location.

Limit allowable variation from line and grade to a maximum of 2 percent.

Pressures grout any voids that develop during the installation operation and are determined by the Engineer to be detrimental to the Work with an approved mix.

Directional boring operations inherently include the risk of encountering below grade obstructions that begin to alter the bore direction. Should an obstruction be encountered, notify the Engineer immediately. Attempt to restore the bore alignment by performing a minimum of three attempts at each encountered obstruction with different corrective measures. Boring deeper or shallower (if minimum conduit depth can be maintained), moving the boring head to the right or left of the obstruction, or attempting to bore through the obstruction (if other than solid rock) are acceptable corrective measures to restore bore alignment. The Engineer may authorize a relocation of the bore if a suitable bore alignment cannot be restored.

F. Removals

Remove all temporary and existing Cable Television facilities in accordance with the requirements set forth in the Plans, Owner Standards/Details/Specifications and Related Documents, and as instructed by the Owner Project Manager. Cutting of poles specified for removal or abandonment will not be permitted. Remove pole(s) and backfill void in accordance with Section 207. Backfill any voids remaining from the removal of underground facilities in accordance with Section 207. Replace, in-kind (material and depth), any voids remaining in roadway structures.

G. Transfers

Transfer all Cable Television Systems in accordance with the requirements set forth in the Plans, Owner Standards/Details/Specifications and Related Documents, and as instructed by the Owner Project Manager.

H. Remaining Material

1. Material Originating from The Owner:

   Return all unused material to the Owner. Provide a detailed summary to the Engineer comparing quantities of material received from the Owner and material to be returned to the Owner. The Owner Project Manager will verify and accept or reject all returned material. Credit the Department for any material rejected by the Owner due to, but not limited to, damage, material loss, or material theft.

2. Material Originating from the Project Site – Existing or Surplus Material:

   All surplus material originating from the project site that is removed and not intended for re-use on the project becomes the property of the Owner. Surplus materials will be inspected and accepted for
salvage or designated waste by the Owner Project Manager. Transport salvaged materials to the Owner. Return all electrical equipment to the Owner. The Owner Project Manager will verify all materials are returned to the Owner.

951.3.06 Quality Acceptance

A. Testing

Follow all relevant procedures set forth in the documents Owner Standards/Details/Specifications and Related Documents. Ensure Owner Project Manager is present at all inspection and testing. Correct all deficiencies in the Work indicated by testing, inspecting, and as directed by the Engineer or Owner Project Manager.

B. Semi-Final Utility Inspection

When the contractor has finished the Cable Television System Work, the Contractor may, by written notice, request that a semi-final utility inspection be made. The Engineer, along with the Owner, will determine if the Cable Television System Work is ready for semi-final utility inspection. The Engineer, in agreement with the Owner, will have the final decision on when the Cable Television System Work is complete and thereby ready for semi-final utility inspection. If all the Cable Television System Work provided for and contemplated by the Contract is found to be complete to the Engineer’s satisfaction and all documents required in connection with the Cable Television System Work has been submitted and accepted, then, the Contractor may request transfer of the completed Cable Television System Work to the Owner.

Once the new facilities are in service and accepted by the Owner, provide written correspondence notifying the Engineer and Owner that utility location services will be the responsibility of said Owner.

Such partial acceptance shall in no way relieve the Contractor of the responsibility for satisfactory completion of the Contract, or for failure of any portion of the Cable Television System Work prior to Final Acceptance of the Project.

951.3.07 Contractor Warranty and Maintenance

Abide by and honor the following Warranty Statement:

Contractor hereby warrants for a period of one (1) year (or longer, if so provided by law, and to the extent provided by law) from and after the date of Completion of work detailed in the Plans that all labor, workmanship, components, materials or other parts of the Work will be free from defects in material and workmanship under normal use and service. Contractor shall, at its own expense, repair or replace any defective components or parts supplied by Contractor or any Sub-Contractor. In addition, provided that the defect is the result of, or is any way caused by, any act or omission of Contractor or any Sub-Contractor, Contractor shall, at its own expense, repair or replace any defective components or parts supplied by the Owner. Such repairs or replacement parts are warranted for one (1) year from the date of incorporation in the Work or the remainder of the original warranty period, whichever is longer. Contractor will pay all reasonable costs (including without limitation attorneys’ fees) incurred by or on behalf of the Owner in identifying a defect found to be the responsibility of Contractor. Upon notice from the Owner, Contractor will immediately correct and remedy any defects occurring during the warranty period without cost or expense to the Owner. Nothing contained herein, however, shall be construed to define or limit the rights of the Owner as otherwise provided by law or elsewhere in the Documents in the event such defects occur. After construction is completed and during the balance of the warranty period, the Owner may choose to have its agents, employees or other contractors perform any required replacement or repairs. If the
Section 951 – Cable Systems

Owner or its agent performs the repairs or replacement, the Owner shall invoice Contractor for the Owner’s reasonable costs, including without limitation, labor costs, and Contractor shall pay the Owner for such costs within thirty (30) days after receipt of an invoice or, at the Owner’s option, the Owner may deduct such costs from any Retained Amount or from any amount owed by the Owner or any of its Affiliates to Contractor or any of its Affiliates in connection with this or any other agreement. With respect to installation, Audit or Disconnect work, if the Owner discovers defects in the Work within one (1) year after Completion of the installation, Audit or Disconnect, the Owner may require Contractor to correct the defects at no expense to the Owner, or may elect to have the Work corrected by the Owner’s personnel or other Contractors of the Owner and charge the cost thereof to Contractor as provided above.

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951.4 Measurement

Overhead and underground Cable Television Systems, and other items of Work in this Specification, in place, operational, and accepted, are measured for payment as follows:

A. Overhead Cable Television

Overhead Cable Television is measured in linear feet (meter) for the facility installed and accepted. The facility is measured along the centerline of the facility from pole structure to pole structure through all connections, active and passive devices, amplifiers, and all other electrical equipment and shall include the installation of the pole structures, if specified in the Plans, and any materials required by the Owner Standards/Details/Specifications and Related Documents. Measurement will begin and end at existing pole structures where the newly installed Work ties back to the existing facility or specified ending structure. There will be no compensation for replacement of damaged or lost materials. There will be no separate measurement and payment for the transfer of existing materials to new location. Include the costs of transferring materials in the costs for the installation of Overhead Cable Television System, temporary or permanent.

Obtain measurements with electronic survey equipment and provide Engineer with printout of installed facilities indicating State Plane Coordinates and station numbers of each pole structure and indicate distances between pole structures starting from the beginning of the Work (existing facility pole structure).

B. Overhead Cable Television (Temporary)

Temporary Overhead Cable Television is measured in linear feet (meter) for the facility installed. The facility is measured along the centerline of the facility from pole structure to pole structure though all connections, active and passive devices, amplifiers, and all other electrical equipment and shall include the installation of the pole structures, if specified in the plans, and any materials required by the Owner Standards/Details/Specifications and Related Documents. Measurement will begin and end at existing pole structures where the newly installed Work connects to the existing facility or specified ending structure. There will be no compensation for replacement of damaged or lost materials. There will be no separate measurement and payment for the transfer of existing materials to new location. Include the costs of transferring materials in the costs for the installation of Overhead Cable Television System, temporary or permanent.
Section 951 – Cable Systems

Obtain measurements with electronic survey equipment and provide Engineer with printout of installed facilities indicating State Plane Coordinates and station numbers of each pole structure and indicate distances between pole structures starting from the beginning of the Work (existing facility pole structure).

C. Underground Cable Television

Underground Cable Television is measured in linear feet (meter) for the facility installed. The facility is measured along the center following the existing ground line from structure to structure through pedestals, vaults, junction boxes, and all other electrical equipment and shall include the installation of the pole structures, if specified in the plans, and any materials required by the Owner Standards/Details/Specifications and Related Documents. Measurement will begin and end at existing pole structures, vaults, pedestals, junction boxes, or splice points where the newly installed Work connects to the existing facility. All measurements will begin and terminate at the intersection of the structure and grade. Measurement for buried facilities that transition up pole structures to tie to the overhead facilities will not be made. There will be no compensation for replacement of damaged or lost materials. There will be no separate measurement and payment for the transfer of existing materials to new location. Include the costs of transferring materials in the costs for the installation of Underground Cable Television System, temporary or permanent. There will be no separate measurement and payment for directional boring. Include the costs of directional boring in the costs of Underground Cable Television System, Temporary or Permanent.

Obtain measurements with electronic survey equipment and provide Engineer with printout of installed facilities indicating State Plane Coordinates and station numbers of each underground structure and pole structure and indicate distances between structures starting from the beginning of the Work (existing facility structure).

D. Installation of Poles

Installation of Steel, Concrete, and Wood Poles will not be measured separately for payment. Steel, Concrete, and Wood Poles are included in the measurement of the Overhead or Underground Cable Television, Permanent or Temporary.

E. Installation of Cable Television Wire

Installation of cable for a feeder, trunk, or fiber lines will not be measured separately for payment. Cable is included in the measurement of the Overhead or Underground Cable Television, Permanent or Temporary.

F. Removal of Overhead Cable Television, Permanent or Temporary

Removal of the Overhead Cable Television is measured in linear feet (meter) for the facility removed. The facility is measured along the centerline of the facility from pole structure to pole structure through all connections, active and passive devices, amplifiers, and all other electrical equipment. Measurement will begin and end at existing pole structures where the Cable Television facility specified for removal connects to the existing facility to remain. There will be no separate measurement and payment for the transfer of existing materials to new location. Include the costs of transferring materials in the costs for the installation of Overhead Cable Television System, Temporary or Permanent. There will be no separate measurement and payment for backfilling of voids remaining from removal or replacement of roadway sections. Removal of Cable television service lines will be measured as specified in this Section.
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Obtain measurements with electronic survey equipment and provide Engineer with printout of removed facilities indicating State Plane Coordinates and station numbers of each pole structure and indicate distances between pole structures starting from the beginning of the Work (existing facility pole structure).

G. Removal of Underground Cable Television, Permanent or Temporary

Removal of Underground Cable Television is measured in linear feet (meter) for the facility removed. The facility is measured along the center following the existing ground line from structure to structure through pedestals, vaults, junction boxes, and all other electrical equipment, and shall include the removal, if required by the plans, of any materials that are integral to the temporary facility. Measurement will begin and end at existing pole structures or vault structures where the newly installed facility connects to the existing facility. There will be no separate measurement and payment for the transfer of existing materials to new location. Include the costs of transferring materials in the costs for the installation of Underground Cable Television System, Temporary or Permanent. There will be no separate measurement and payment for backfilling of voids left by removed underground equipment or from removal or replacement of roadway section.

Obtain measurements with electronic survey equipment and provide Engineer with printout of removed facilities indicating State Plane Coordinates and station numbers of each underground structure and pole structure and indicate distances between structures starting from the beginning of the Work (existing facility structure).

H. Removal of Poles

Removal of Steel, Concrete, and Wood Poles will not be measured separately for payment. Removal is included in the measurement of the removal of Overhead or Underground Cable Television, permanent or temporary.

I. Material Credit

Material Credit is a dollar amount credited to the Department for unused or remaining Owner provided materials rejected by the Owner as being damaged or destroyed or materials lost or stolen. The amount will be tabulated based on an itemized list from the Owner and based on unused material remaining from the Work.

951.4.01 Limits
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951.5 Payment

The Contract Unit Price for each Item shall include all costs incidental to the construction of the Item according to the Plans, Owner Standards/Details/Specifications and Related Documents, and as specified in this Section. Payment for any Item listed below is full compensation for the Item or Items in place, operational, and accepted.

A. Overhead Cable Television

Overhead Cable Television will be paid for at the contract unit price per linear foot (meter) for the facility installed. Payment is full compensation for handling, delivery, and storage of material and installation of material in accordance with the Plans and Owner Standards/Details/Specifications and Related Documents. Payment is full compensation for necessary handling and delivery of surplus material to the Owner. Payment
Section 951 – Cable Systems

is full compensation for all the necessary equipment and labor to install the Overhead Cable Television, including all items necessary and items specified in the Owner Standards/Details/Specifications and Related Documents and Plans. Payment is full compensation for the entire linear feet required to span the portion of the project specified and to tie back to existing facilities. This includes items such as cable, connectors, active and passive devices, amplifiers, poles (wood, steel, or concrete), and any other item(s) necessary to provide for an in place and accepted operational Overhead Cable Television of the size specified in the Plans and Owner Standards/Details/Specifications and Related Documents.

B. Overhead Cable Television (Temporary)

Temporary Overhead Cable Television will be paid for at the contract unit price per linear foot (meter) for the facility installed. Payment is full compensation for handling, delivery, and storage of materials and installation of materials in accordance with the Plans and Owner Standards/Details/Specifications and Related Documents. Payment is full compensation for any work required to accommodate project staging, detours, or structures not specified for payment elsewhere in the contract. Payment is full compensation for necessary handling and delivery of surplus material to the Owner. Payment is full compensation for all the necessary equipment and labor to install the Temporary Cable Television, including all items necessary and items specified in the Owner Standards/Details/Specifications and Related Documents and Plans. Payment is full compensation for the entire linear feet required to span the portion of the project specified and to tie back to existing facilities. This includes items such as cable, connectors, active and passive devices, amplifiers, poles (wood, steel, or concrete) and any other item(s) necessary to provide for an in place and accepted operational Overhead Cable Television of the size specified in the Plans and Owner Standards/Details/Specifications and Related Documents.

C. Underground Cable Television

Underground Cable Television will be paid for at the contract unit price per linear foot (meter) for the facility installed. Payment is full compensation for handling, delivery, and storage of material and installation of material in accordance with the Plans and Owner Standards/Details/Specifications and Related Documents. Payment is full compensation for necessary handling and delivery of surplus material to the Owner. Payment is full compensation for all the necessary equipment and labor to install the Underground Cable Television, including all items necessary and items specified in the Owner Standards/Details/Specifications and Related Documents and Plans. Payment is full compensation for the entire linear feet (meter) required to traverse, below grade, the portion of the project specified and to tie back to existing facilities. This includes items such as pole structures, directional boring, wire, conduit, vaults, pedestals, junction boxes, splice points, and any other item(s) necessary to provide for an in place and accepted operational Underground Cable Television of the size specified in the Plans and Owner Standards/Details/Specifications and Related Documents. There will be no separate measurement and payment for directional boring. Include the costs of directional boring in the costs of Underground Cable Television System, Temporary or Permanent.

D. Installation of Poles

No separate payment will be made for the installation of Steel, Concrete, or Wood Poles. Costs for the installation of poles are included in the price for Overhead or Underground Cable Television, Permanent or Temporary.
Section 951 – Cable Systems

E. Installation of Cable Television Wire

No separate payment will be made for the installation of cable for feeder, trunk, or fiber lines. Costs for the installation of cable are included in the price for Overhead or Underground Cable Television, Temporary or Permanent.

F. Removal of Overhead Cable Television, Permanent or Temporary

Removal of Overhead Cable Television will be paid for at the contract unit price per linear foot (meter) for the facility removed. Payment is full compensation for removal, handling, delivery, storage, and surplus of materials. Payment is full compensation for necessary handling and delivery of surplus material to the Owner. Payment is full compensation for all the necessary equipment and labor to remove the Overhead Cable Television. Payment is full compensation for the entire linear feet (meter) removed back to existing or new facilities as shown on the Plans. This includes items such as cable, connectors, active and passive devices, amplifiers, poles (wood, steel, or concrete), and any other item(s) necessary for complete removal.

All material removed and not re-used becomes the property of the Owner. Payment for Removal of Overhead Cable Television includes the removal, handling, delivery, and off loading of all material at a Comcast Operating Headquarters specified by the Owner Project Manager.

G. Removal of Underground Cable Television, Permanent or Temporary

Removal of Underground Cable Television will be paid for at the contract unit price per linear foot (meter) for the facility removed. Payment is full compensation for removal, handling, delivery, storage, and surplus of materials. Payment is full compensation for all the necessary equipment and labor to remove the Underground Cable Television. Payment is full compensation for the entire linear feet (meter) removed back to existing or new facilities as shown on the Plans. This includes removal of items such as wire, conduit, transformers, vaults, hardware, and any other item(s) necessary for complete removal.

All material removed and not re-used becomes the property of the Owner. Payment for Removal of Overhead Cable Television includes the removal, handling, delivery, and off loading of all material at a Comcast Operating Headquarters specified by the Owner Project Manager.

H. Removal of Poles

No separate payment will be made for the removal of Steel, Concrete, or Wood Poles.

I. Material Credit

Material Credit is a dollar amount credited to the Department for the value of unused or remaining Owner provided materials rejected by the Owner as being damaged or destroyed or materials lost or stolen. The amount will be tabulated based on an itemized list from the Owner or all Owner provided materials and based on the unused material remaining from the work that was not returned to the Owner or was rejected by the Owner.

Payment will be made under:

<table>
<thead>
<tr>
<th>Item No. 951</th>
<th>Overhead Cable Television, Feeder – Coax, ____ in</th>
<th>Per linear foot (meter)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item No. 951</td>
<td>Overhead Cable Television, Service, RG6, – Coax, ____ in</td>
<td>Per linear foot (meter)</td>
</tr>
</tbody>
</table>
Section 951 – Cable Systems

<table>
<thead>
<tr>
<th>Item No. 951</th>
<th>Description</th>
<th>Unit Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>951.5.01</td>
<td>Adjustments</td>
<td></td>
</tr>
</tbody>
</table>

General Provisions 101 through 150

Office of Utilities
GEORGIA DEPARTMENT OF TRANSPORTATION

DESIGN-BUILD CONTRACT

PROJECT NUMBER
P.I. No. 210327-

CONTRACT ID
B1CBA1801645-0

I-20 AT SAVANNAH RIVER BRIDGE REPLACEMENTS

AND ROADWAY WIDENING PROJECT

Dated Advertisement: June 14, 2018

Amendment 1 Issued: July 27, 2018

Amendment 2 Issued: August 31, 2018

Amendment 3 Issued: September 17, 2018

Letting Date: October 19, 2018

Part 3 of 3
Georgia Department of Transportation

Technical Provisions

For

Design-Build Agreement

P.I. No. 210327-

Attachment 11-1

DESIGN CRITERIA TABLE
## Design Criteria for Georgia

<table>
<thead>
<tr>
<th>Design Element</th>
<th>I-20</th>
<th>Source</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roadway Classification</td>
<td>Interstate (Urban)</td>
<td>GDOT Office of Transportation Data</td>
<td></td>
</tr>
<tr>
<td>Basic No. of Lanes</td>
<td>6 (3 in each direction)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Design Vehicle</td>
<td>WB-67</td>
<td>GDOT Design Policy Manual, Table 3.1</td>
<td></td>
</tr>
<tr>
<td>Design Speed (MPH)</td>
<td>65</td>
<td>AASHTO 2011, Table 10-1, pg 10-89 &amp; GDOT DPM Table 6.7 Freeways; GDOT DPM, Table 3.1</td>
<td></td>
</tr>
<tr>
<td>Lane Width</td>
<td>12'</td>
<td>AASHTO Design Standards for Interstate System 2016, pg 4; GDOT DPM Table 6.7; Ramps-AASHTO, pg 10-102; GDOT DPM, pg 6-2; GDOT DPM Figure 6.9</td>
<td></td>
</tr>
<tr>
<td>Inside Shoulder Width</td>
<td>12' Paved (w/CMB)</td>
<td>AASHTO Design Standards for Interstate System 2016, pg 4; GDOT DPM Table 6.7; Ramps-AASHTO, pg 10-102; GDOT DPM, pg 6-2; GDOT DPM Figure 6.9</td>
<td></td>
</tr>
<tr>
<td>Outside Shoulder Width</td>
<td>14' Overall 12' Paved</td>
<td>AASHTO Design Standards for Interstate System 2016, pg 4; GDOT DPM Table 6.7; Ramps-AASHTO, pg 10-102; GDOT DPM, pg 6-2; GDOT DPM Figure 6.9</td>
<td></td>
</tr>
<tr>
<td>Typical Roadway Cross Slope</td>
<td>Drain Both Sides 2% towards outside(2 outside lane) 2% towards median (insidelane) Drain Only Outside 2% (2 inside lane) 3% (3rd lane - outside lane)</td>
<td>AASHTO Design Standards for Interstate System 2016, pg 5; GDOT DPM, Page 6-1, &amp; GDOT DPM Table 6.7 Freeways</td>
<td></td>
</tr>
<tr>
<td>Inside Paved Shoulder Cross Slope</td>
<td>2% Draining Outside 4% Draining Inside</td>
<td>AASHTO Design Standards for Interstate System 2016, pg 5; GDOT DPM, Figure 6.7</td>
<td>8% max breakover</td>
</tr>
<tr>
<td>Outside Paved Shoulder Cross Slope</td>
<td>*3% Concrete 6% Asphalt</td>
<td>AASHTO Design Standards for Interstate System 2016, pg 5; GDOT DPM Fig. 6.7; Fig 6.8; Fig. 6.9</td>
<td>8% max breakover</td>
</tr>
<tr>
<td>E max</td>
<td>6%</td>
<td>GA DOT DPM, Table 4.8;</td>
<td>*3% cross slope used to accomodate future widening if all the lanes are draining outside</td>
</tr>
</tbody>
</table>

1 of 3
<table>
<thead>
<tr>
<th>Design Element</th>
<th>I-20</th>
<th>Source</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum Curvature of Horizontal Curve</td>
<td>1,660'</td>
<td>AASHTO, 2011</td>
<td></td>
</tr>
<tr>
<td>Minimum Curvature of Horizontal Curve using Reverse Crown and Normal Cross Slope</td>
<td>9,130' (RC)</td>
<td>AASHTO, 2011</td>
<td>1.75:1 max ratio when going from flatter to sharper compound curves (DPM 4.2.2)</td>
</tr>
<tr>
<td></td>
<td>12,600' (NC)</td>
<td>Page 3-47, Table 3-10b</td>
<td></td>
</tr>
<tr>
<td>Minimum Length of Horizontal Curve (ft.)</td>
<td>Δ greater than or equal to 5 degrees LC = 1950' a</td>
<td>AASHTO, 2011 Section 3.3.13 pg 3-111; GDOT Design Policy Manual, Section 4.2.2</td>
<td>∆ greater than or equal to 5 degrees a. LC I-20 Mainline = 30<em>V b. LC I-20 Service Ramps = 15</em>V</td>
</tr>
<tr>
<td></td>
<td>Δ less than 5 degrees LC = 500' + 100' x ( 5°-Δ )</td>
<td></td>
<td>∆ less than 5 degrees LC = 500' + 100' x ( 5°-Δ )</td>
</tr>
<tr>
<td>SE Runoff Rate (Lr) Horizontal (ft.) / 1.0% SE change (1 Lane/2Lane ) Rotation</td>
<td>L depends on radii</td>
<td>AASHTO, 2011 Page 3-65, Table 3-17b</td>
<td></td>
</tr>
<tr>
<td>Desirable super elevation Runoff Transition Split</td>
<td>2/3L</td>
<td>GDOT Design Policy Manual, Section 4.5.4</td>
<td></td>
</tr>
<tr>
<td>In Tangent</td>
<td>1/3L</td>
<td>GDOT Design Policy Manual, Section 4.5.4</td>
<td></td>
</tr>
<tr>
<td>In Curve</td>
<td></td>
<td>GDOT Design Policy Manual, Table 4.1.</td>
<td></td>
</tr>
<tr>
<td>Max. Angle of Horizontal Deflection Without use of a Curve</td>
<td>16 minutes (0.2666 Deg.)</td>
<td>GDOT Design Policy Manual, Table 4.1.</td>
<td></td>
</tr>
<tr>
<td>Minimum Tangent Between Curves In Same Direction (Lc)</td>
<td>1950' a</td>
<td>GDOT Design Policy Manual, Section 4.2.2</td>
<td>a. LC I-20 Mainline = 30<em>V- b. LC I-20 Service Ramps, Loop Ramps = 15</em>V</td>
</tr>
<tr>
<td>Entrance Terminal Accel. Length</td>
<td>N/A</td>
<td>AASHTO, 2011 Page 10-110, Table 10-3</td>
<td></td>
</tr>
</tbody>
</table>
## Design Criteria for Georgia

<table>
<thead>
<tr>
<th>Design Element</th>
<th>I-20</th>
<th>Source</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exit Terminal Decel. Length</td>
<td>280' for 50MPH</td>
<td>AASHTO, 2011 Page 10-115, Table 10-5</td>
<td></td>
</tr>
<tr>
<td>Clear Zone from Edge of Travel Lane</td>
<td>Varies - per AASHTO Roadside</td>
<td>AASHTO 2011 Roadside Design Guide: Table 3-1</td>
<td></td>
</tr>
<tr>
<td>Stopping Sight Distance</td>
<td>645'[on flat grades]</td>
<td>AASHTO, 2011 Page 3-4, Table 3-1 &amp; Page 3-5 Table 3-2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>682'[3% Downgrades]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum Profile Grade (%)</td>
<td>4.00%</td>
<td>AASHTO Design Standards for Interstate System 2016, pg 3 Table 2;</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>AASHTO, 2011 Page 10-93 and Page 8-4 Table 8-1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>GDOT Design Policy Manual, Table 4.7</td>
<td></td>
</tr>
<tr>
<td>Maximum change in grade</td>
<td>0.30%</td>
<td>GDOT Design Policy Manual, Table 4.7</td>
<td></td>
</tr>
<tr>
<td>without vertical curve (%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minimum K Value for Crest Vertical Curve</td>
<td>193</td>
<td>AASHTO, 2011 Page 3-155, Table 3-34</td>
<td></td>
</tr>
<tr>
<td>Minimum K Value for Sag Vertical Curve</td>
<td>157</td>
<td>AASHTO, 2011 Page 3-161, Table3-36</td>
<td></td>
</tr>
<tr>
<td>Fore Slope Ratio(max/normal)</td>
<td>2:1/6:1</td>
<td>GDOT Design Policy Manual, Table 6.7</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Steeper than 4:1 requires Guardrail</td>
</tr>
<tr>
<td>Back Slope Ratio (max/normal)</td>
<td>2:1/4:1</td>
<td>GDOT Design Policy Manual, Table 6.7</td>
<td></td>
</tr>
<tr>
<td>Vertical Clearance: Roadway over Roadway</td>
<td>17'-0&quot;(min)</td>
<td>GDOT Bridge and Structures Design Manual - Section 2.3.3.1 and Table 2.3.3.1-1 ***Needs prior approval from the GDOT Bridge Office</td>
<td></td>
</tr>
<tr>
<td></td>
<td>16' 6&quot; (permissible)***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vertical Clearance:Roadway Over Railway</td>
<td>23'-0&quot;</td>
<td>GDOT Bridge and Structures Design Manual - Section 2.3.4.1</td>
<td></td>
</tr>
</tbody>
</table>

Notes:

1. GDOT DPM: On high speed freeway and Interstate sections with six or more lanes, where truck traffic exceeds 250 DDHV, a paved inside shoulder width of 12-ft **should be considered**.
2. For short sections less than 500 feet and for one-way downgrades, the maximum grade may be 1% steeper than the values appearing in Table 4.3.2 of the GDOT Design Manual.
DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

SPECIAL PROVISION

Section 300—General Specifications for Base and Subbase Courses

Delete Subsection 300.3.02.H and substitute the following:

H. Fine Grading Equipment

An approved fine grading machine is required for finishing the base and subbase material supporting Portland cement concrete pavement or hot mix asphaltic concrete pavement. Ensure fine grader:

- Is self-propelled and track driven.
- Is capable of trimming and finishing the base and subbase to the specified tolerances utilizing a rotating cutter head in front of a strike-off screed.
- Spans at least one lane width and is controlled automatically by direct contact with a string line or a combination of string line and existing pavement as appropriate.
- Is capable of trimming and finishing base and subbase to the specified tolerances.

Furnish, place, and maintain the necessary string lines to provide continuous line and grade reference to the fine grader control system. GPS controlled equipment can be used in lieu of string lines.

For Graded Aggregate Base construction, a motor grader equipped with GPS controlled equipment can be used as an option for fine grading.

GPS controlled Equipment will include but is not limited to:

1. Ability to read electronic files containing Department supplied data used to design the project.

2. Fixed or movable base station setup on the project to serve as a point of reference for the project. As the project progresses, the movable base station shall be moved for proper system function. If the base station is at a fixed location, radio repeaters will be utilized to ensure the signals from the base station are received throughout the project.

3. A GPS sensor mounted atop a mast affixed to the cutting blade. The masts will be arranged in a dual mast setup with a mast on each end of the blade attachment or in a lone mast setup. The sensor will be able to receive signals from the base station and/or a laser transmitter.

4. A blade position sensor with the ability to detect blade attitude and elevation of the cutting blade and relay this information to the operator. Blade attitude is defined as the orientation of the blade with respect to the three spatial axes in relation to a reference plane.
5. An operator-visible display allowing the operator to visually receive all necessary data in real-time from the GPS system and the cutting blade to properly construct the section to grade. The display will also reflect any changes made by the operator to any operation of the cutting blade.

6. If conformity to the cross sections with the prior listed equipment is unsatisfactory, provide a laser transmitter placed no farther than 800 feet (244 m) from the fine grading equipment. Projects having work progressing at different work sites more than 800 feet (244 m) apart necessitate the use of more than one laser transmitter to ensure accuracy. Select a location for the laser transmitter having a change in elevation of 25 feet (7.62 m) or less from the laser transmitter to the sensor mounted on the cutting blade. If project geography necessitates the use of more than one laser transmitter, the setup of the transmitters will be set to ensure the elevation difference between two consecutive transmitters in an array is not more than 25 feet (7.62 m); and this array cannot exceed a total change in elevation of 100 feet (30.5 m).

Office of Materials & Research
Georgia Department of Transportation

Technical Provisions
For
Design-Build Agreement
P.I. Nos. 210327-

Attachment 13-1

SP 443 Elastomeric Profile Bridge Joint Seals
SP 447 Modular Expansion Joints
SP 449 Silicone Seal
SP 449 Bridge Deck Joint Seals
SP 500 HPC
SP 500 Light Weight Concrete
SP 500 LRFD
SP 500 Mass Concrete
SP 511 Mechanical Bar Splice
SP 581 Disc Bearings
SP 865 Manufacture of Prestressed Concrete Members
DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

SPECIAL PROVISION

Project No:
P.I. No. 210327-

SECTION 443 - ELASTOMERIC PROFILE BRIDGE JOINT SEALS

443.1 General Description

This work consists of furnishing and installing a bridge deck joint seal device to the limits shown on the plans that consists of a monolithic steel strip seal retainer, a polychloroprene gland, and a lubricant adhesive. Only a continuous full length strip seal joint system is acceptable, unless stage construction or excessive length prohibits monolithic installation. Utilize a prequalified expansion device manufacturer with a five year proven history of successful product manufacture.

Provide an expansion joint device designed for HS-20 truck loading and impact in accordance with 2002 AASHTO specifications.

443.1.01 Definitions

A. Strip Seal Expansion Joint Device

This device is constructed of steel elements designed with a locking mechanism capable of securely locking the edges of a continuous non-reinforced polychloroprene gland. The steel elements are anchored to the structure in accordance with the specification. All materials are as specified in the contract documents or as recommended by the manufacturer of the strip seal joint assembly. The strip seal joint assembly is referred to throughout the specifications as the expansion joint device.

B. Joint

Provide joint opening between two portions of a structure to allow for expansion and contraction.

443.1.02 Related References

General Provisions 101 through 150.

443.1.02 Submittals
Submit for review by the Engineer, complete shop drawings and product data for the expansion device. Submit seven (7) complete sets of information. At the discretion of the Engineer, furnish facilities for inspection of the completed device or a representative sample in the manufacturer’s plant. Allow the inspector free access to the necessary parts of the manufacturer’s plant. Accurately set and securely support at the correct grade and elevation and the correct joint opening based on temperature as shown on the plans and on the approved shop drawings.

443.2 Materials

Furnish a manufacturer’s certification that the materials proposed for use on the project have been pretested and meet the requirements as set forth in the specification and as detailed in the corresponding contract drawings. Do not install materials in the field prior to the Engineer’s approval. The strip seal expansion joint device, including anchorages, is to be supplied by the manufacturer. The following requirements for each component are to be verified by the manufacturer:

A. Steel Elements

Provide ASTM A-588 weathering grade steel for the material utilized to produce a shape suitable to mechanically lock the sealing element in place throughout the normal movement cycle of the joint. Provide a minimum thickness of ¼ in. as measured from the internal locking mechanism cavity to the top surface of the steel retainer. Provide minimum dimensions of 2-1/4 in. width and 3 in. height.

Provide steel strip seal retainers that are a monolithic steel shape with a machined seal retainer cavity. Multiple component welded steel shapes and rolled steel, that is bent or crimped to achieve final shape and/or seal retainer cavity, is not permitted. Perform all welding in accordance to the Georgia Standard Specifications and paragraph D-1.5 of the AWS welding code. Provide full penetration groove welds for splices between sections of steel strip seal retainers.

B. Continuous Polychloroprene Gland

Supply and install the polychloroprene gland in one continuous length. Provide a gland with a shape that promotes self-removal of foreign material during normal joint operation. Provide a gland with physical properties generally in accordance with the following:

<table>
<thead>
<tr>
<th>Physical Property</th>
<th>ASTM Test Method</th>
<th>Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tensile strength, min, psi</td>
<td>D-412</td>
<td>2000</td>
</tr>
<tr>
<td>Elongation @ break, min, %</td>
<td>D-412</td>
<td>250%</td>
</tr>
<tr>
<td>Hardness, Type A durometer</td>
<td>D-2240 Modified</td>
<td>55 ± 5% points</td>
</tr>
<tr>
<td>Oven aging, 70h @ 212°F</td>
<td>D-573</td>
<td></td>
</tr>
<tr>
<td>Tensile strength, max % loss</td>
<td></td>
<td>20% max</td>
</tr>
<tr>
<td>Elongation, max % loss</td>
<td></td>
<td>20% max</td>
</tr>
<tr>
<td>Hardness, Type A durometer, points change</td>
<td>D-2240 Modified</td>
<td>0 to + 10</td>
</tr>
<tr>
<td>Oil Swell, ASTM Oil No. 3, 70h @ 212°F</td>
<td>D-471</td>
<td>45%</td>
</tr>
<tr>
<td>Weight change, max %</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Property</td>
<td>Specification</td>
<td>Result</td>
</tr>
<tr>
<td>----------------------------------------------</td>
<td>---------------------</td>
<td>-----------------</td>
</tr>
<tr>
<td>Ozone resistance</td>
<td>D-1149 Modified</td>
<td>no cracks</td>
</tr>
<tr>
<td>20% strain, 300 pphm in air 70h @ 104°F</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low temperature stiffening, 7 days @ 14°F</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hardness, Type A durometer, points change</td>
<td></td>
<td>0 to + 15</td>
</tr>
<tr>
<td>Compression Set, 70h @ 212°F max</td>
<td>D-395 Method B</td>
<td>40% (modified)</td>
</tr>
</tbody>
</table>

C. **Lubricant Adhesive**

Use a one part moisture curing polyurethane and hydrocarbon solvent mixture meeting the requirements of ASTM D-4070-81 for the material used in bonding the polychloroprene gland to the steel elements.

D. **Anchorage**

Provide an anchorage as detailed on the contract drawings with a minimum of 0.75 in$^2$ of bolt area per 1.0 linear foot of joint (Minimum ½ in. diameter hardware at 6 in. O.C. both sides of joint).

443.2.01 **Delivery, Storage and Handling**

General Provisions 101 through 150.

Store all materials to prevent damage from the elements and to ensure the preservation of its quality and fitness for the work. Avoid contact with flame.

Inspect all stored materials, although accepted before storage, prior to their use in the work. Ensure that all stored materials meet the requirements of the Contract at the time of use.

Remove from the site of the work immediately, any material rejected because of failure to meet the required tests or rejected because of damage. Replace all removed material at no additional cost to the Department.

443.3 **Construction Requirements**

443.3.01 **Personnel**

General Provision 101 through 150.

443.3.02 **Equipment**

General Provisions 101 through 150.

443.3.03 **Preparation**

General Provisions 101 through 150.

443.3.04 **Fabrication**
General Provisions 101 through 150.

443.3.05 Construction

Measure and record the surface temperature of the concrete and/or steel with a surface thermometer as described below. Record the temperature of the underside of the concrete slab at each end of the superstructure element adjacent to the expansion joint. Take the average of the readings to use with the temperature shown on the shop drawings.

Immediately prior to installation, inspect the joint system for proper alignment and complete bond between the neoprene sealer and the steel and proper stud placement and effectiveness. No bends or kinks in the joint system are allowed, except as necessary to follow the roadway grades. Any joint system exhibiting bends or kinks due to transporting or as a result of mishandling are to be removed from the work site, and replaced by a new joint system, at no additional expense to the Department. Where stage construction is required, connect all steel sections using full penetration groove welds.

Inspect studs visually and give each a light blow with a 4 lb. hammer to ensure full connection to steel. Replace any stud which does not have a complete end weld, or does not emit a ringing sound when struck with a light blow by hammer. Carefully remove studs located more than 1 inch in any direction from the location shown on the shop drawings and provide a new stud placed on the proper location. Perform all stud replacements at no additional expense to the Department.

Blast clean all metal surfaces to come in contact with the neoprene sealer in accordance with the requirements of Steel Structures Painting Council Surface Preparation NO. 6 (SSPC-SP6)-Commercial Blast Cleaning. After cleaning, all cleaned surfaces are to exhibit a clean quality of CSA 2, or better, as defined by Steel Structures Painting Council Standard SSPC-VIS 1.

Protect cleaned metal surfaces until such time as the sealer and lubricant adhesive are placed against the metal surface. Reclean any metal surface upon which rusting appears in accordance with the foregoing, at no additional expense to the Department. Replace neoprene seals not fully bonded to the steel at no additional expense to the Department.

After installation and when the adjacent concrete is cured, water test the expansion joint device under the Engineer’s direction and supervision. Seeping of water through the joint is cause for rejection of the expansion joint device.

443.4 Measurement

Measurement for the expansion device is per each device completely installed, which is the expansion joint device in place with the concrete placed and finished and the watertight integrity test performed as described above.

443.5 Payment

Payment for the expansion device as specified above is paid for at the Contract Unit price bid per each. Such payment is full compensation for furnishing all equipment and materials and performing the work in accordance with the Plans and Specifications.

Payment will be made under:
| Item No. 443 | Elastomeric Profile Bridge Joint Seals, Bridge No - __, Bent No - __ | Per each |
DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

SPECIAL PROVISION

PROJECT NO.
P.I. NO. 210327-

Section 447—Modular Expansion Joints

Delete Section 447 and substitute the following:

Section 447—Modular Expansion Joints

447.1 General Description
This work includes fabricating, furnishing, and installing a modular expansion joint device at the locations shown on the plans and in accordance with these specifications. Seal the deck surface and side barriers to prevent water from seeping through the bridge deck. Any seeping of water through the joint will be cause for rejection of the expansion device.

Use a modular expansion joint device supplied by one of the following:

(a) Wabo Modular Expansion Joint System— as furnished by:
Watson Bowman Acme
95 Pineview Drive
Amherst, New York 14228 Tel. (716) 691-7566

(b) Steelflex Modular Expansion Joint System— as furnished by:
D.S. Brown Company
300 East Cherry Street
North Baltimore, Ohio 45872 Tel. (419) 257-3561

Only a continuous full length modular joint device supplied by one of the foregoing suppliers is acceptable. No other supplier will be considered. Only one type of modular joint device will be permitted to be installed at all locations. The installation of two different types at separate locations will not be permitted.

447.1.01 Definitions
The term modular expansion device includes the following items:

• Elastomeric joint seals
• Support bar
• Center beam
Section 447 – Modular Expansion Joints

- Edge beam
- Sliding elastomeric bearings

447.1.02 Related References

A. Standard Specifications
   - Section 501—Steel Structures
   - Section 535—Painting Structures
   - Section 645—Repair of Galvanized Coatings
   - Section 851—Structural Steel

B. Referenced Documents
   - General Provisions 101 through 150.

447.1.03 Submittals

A. Shop Drawings
   Submit shop drawings in accordance with Section 501 of the Specifications. Include the manufacturer’s instructions for proper installation of the expansion joint device. Show details of the expansion device at the barrier. Furnish the facilities for testing and inspecting the completed device or have the manufacturer provide a representative sample expansion device in his plant or at an independent test facility. Allow inspectors free access to the necessary parts of the manufacturer’s plant and test facility and cooperate with the Inspector.

447.2 Materials

Ensure that materials meet the following requirements:

<table>
<thead>
<tr>
<th>MATERIAL</th>
<th>SPECIFICATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Structural Steel (except center beams, edge beams and support bars)</td>
<td>ASTM A 709 Gr 36 (A 709 Gr 250)</td>
</tr>
<tr>
<td>Center Beams, Edge Beams and Support Bars</td>
<td>ASTM A 709 Gr 50 (A 709 Gr 345) or ASTM A 709 Gr 50W (A 709 Gr 345W)</td>
</tr>
<tr>
<td>Headed Studs</td>
<td>ASTM A 108</td>
</tr>
<tr>
<td>Premolded Seals, Lubricant, Adhesive, and Sliding Surfaces</td>
<td>As per manufacturer’s current literature and recommendations</td>
</tr>
<tr>
<td>Stainless Steel Bearing Surfaces</td>
<td>ASTM A 167 or A 240M/A 240, Type 304</td>
</tr>
</tbody>
</table>

447.2.01 Delivery, Storage, and Handling

General Provisions 101 through 150.

447.3 Construction Requirements

447.3.01 Personnel

Ensure that the manufacturer provides an experienced representative familiar with the installation of the expansion device to be present at all times while the expansion device is being installed. Notify the expansion device manufacturer of the scheduled installation a minimum of two (2) weeks prior to the installation date.


447.3.02 Fabrication

A. Modular Unit

1. Use a device consisting of premolded elastomeric expansion joint strip seals mechanically held in place by steel center beams and edge beams. Boxseals will not be permitted. Ensure that the components meet the following requirements:
   - Each transverse center beam is a one-piece monolithic shape individually supported by, and welded to, an independent support bar.
   - Edge beams that are a minimum of 4 ⅜ inches (120 mm) in height and have a machined or extruded retainer shape.
   - Securely anchored into concrete.
   - Support bars supported by sliding elastomeric bearings.
   - Provide equal-distance control of the premolded elastomeric seals.

2. Paint or galvanize all structural steel not in contact with elastomers or embedded in concrete in accordance with Section 501. Either painting or galvanizing may be used, unless noted otherwise on the plans. Galvanize (do not paint) portions of structural steel in contact with elastomeric seals or embedded in concrete. Shop apply all paint coats.

B. Center Beams and Support Bars

Design center beams, support bars, and their connections to satisfy the applicable requirements of the current edition of AASHTO Standard Specifications for Highway Bridges. In addition, design center beams and support bars to satisfy the minimum criteria:

- The maximum spacing of the support bars connected to a center beam is 4.0 feet (1.22 m) along the center beam.
- The minimum area of the center beam is 4.9 square inches (645 mm²).
- Minimum section modulus about the horizontal axis for the bottom fiber of a center beam is 5.9 cubic inches (96 684 mm³).
- For the support bar, the minimum area (A) and minimum section modulus, about the horizontal axis for the top fiber (S), is as follows:

<table>
<thead>
<tr>
<th>Rated Movement (inches/millimeters)</th>
<th>0-6/150</th>
<th>0-9/230</th>
<th>0-12/305</th>
<th>0-15/380</th>
<th>0-18/460</th>
<th>0-21/535</th>
<th>0-21/610</th>
</tr>
</thead>
<tbody>
<tr>
<td>A (in²/mm²)</td>
<td>5.1/3290</td>
<td>6.2/4010</td>
<td>7.0/4516</td>
<td>7.7/4968</td>
<td>8.5/5484</td>
<td>9.1/5871</td>
<td>9.7/6258</td>
</tr>
<tr>
<td>S (in³/mm³)</td>
<td>2.9/47522</td>
<td>4.2/68826</td>
<td>5.5/90129</td>
<td>6.7/109793</td>
<td>8.0/131097</td>
<td>9.3/152400</td>
<td>10.4/170426</td>
</tr>
</tbody>
</table>

- Ensure that the center beams and support bars are sufficiently detailed in the shop drawings so that the above minimum section properties can be independently verified using the information contained in the shop drawings.

447.3.03 Construction

Install the modular expansion joint device in strict accordance with the manufacturer’s written instructions, the advice of their representative, and these specifications. Ensure that the permanently installed expansion joint device matches the finished roadway profile and grade.

Immediately prior to installation, have the Engineer inspect the expansion joint device for proper alignment, and complete bond between the premolded elastomeric seals and the steel, and proper stud placement and constructability. Bond any
Section 447 – Modular Expansion Joints
premolded elastomeric seals not fully bonded to the steel. Ensure that all bolted connections are checked and tightened if found to be loose.

Do not allow any bends or kinks in the expansion joint steel (except as necessary to follow the roadway grades). Straightening of bends or kinks will not be allowed. Remove any expansion joint device exhibiting bends or kinks from the work site, and replace it with a new expansion device.

Ensure that the manufacturer presets the expansion joint device prior to shipment. Preset the joint opening at 70° F (21° C) or as indicated on the plans. Remove any mechanical devices supplied to set the expansion joint to the proper width following final adjustment for temperature.

Inspect the concrete anchorages visually and give each one a light blow with a 4 lb (18 N) hammer. Replace any anchorage which does not have a complete weld or does not emit a ringing sound when struck with a light blow of the hammer.

Weld stainless steel sheet to the support member. Adhesive will not be allowed.

Anchor the expansion device as shown on the plans or as shown on the shop drawings approved by the Engineer. Where support bar boxes interfere with the edge beam anchorage method, weld the edge beam to the support bar boxes. For portions of the support bar boxes embedded in concrete, weld all plate connections perimeter in a manner that will prevent water or mortar from entering the box.

Accurately set and securely support the expansion device at the correct grade and elevation, and the correct joint opening as shown on the plans and on the shop drawings. If the maximum time between setting the joint opening and placing concrete exceeds four hours, check and adjust the opening as necessary.

Measure the structure temperature by recording the surface temperature of the concrete and/or steel with a surface thermometer as described below.

1. Concrete bridges: Record the temperature of the underside of the concrete slab at each end of the superstructure element adjacent to the expansion joint. Take the average of the readings to use with the temperature adjustment shown on the plans or on the approved shop drawings.

2. Steel bridges: Record the concrete slab temperature as described above. In addition, record the surface temperature of the shaded portion of the girder web at each location. Average the readings of the steel and concrete to use with the temperature adjustment.

Blast clean all non-galvanized metal surfaces that come in contact with the premolded elastomeric seal and lubricant adhesive in accordance with the requirements of Steel Structures Painting Council Surface Preparation Specification No. 6 (SSPC-SP6, Commercial Blast Cleaning).

Protect the cleaned metal surfaces from rusting until the premolded elastomeric seal and lubricant adhesive are placed against the metal surface. Reclean any previously cleaned metal on which rusting appears in accordance with the foregoing.

In order to perform the work of installing the expansion joint device in a proper manner, some portions of the barrier and bridge deck cannot be constructed until after the expansion joint is installed. After the modular expansion joint device has been set to its final line and grade, fill recess openings in the deck and barrier with concrete (Class AA).

447.3.04 Quality Acceptance

A. Fatigue Testing

Perform fatigue testing by an independent testing laboratory on multiple spans of one or more full-size center beams. Test the same support and connections of the center beams and support bars as for the designed unit. Apply a simultaneous horizontal load, equal to a minimum of 20% of the vertical load. Perform the fatigue testing in accordance with the manufacturer’s recommendations and approved procedures.

B. Watertight Integrity

After the expansion joint device has been permanently installed, test the full length of the device for watertight integrity. Use a method satisfactory to the Engineer.

Cover the entire joint system with water, either ponded or flowing, for a minimum duration of 15 minutes. Inspect the concrete surfaces under the joint during this 15 minute period and also for a minimum of 45 minutes after the supply of water has stopped, for any evidence of dripping water on any surface on the underside of the joint. Patches of moisture are not a cause for non-acceptance.
Section 447 – Modular Expansion Joints

If the joint system exhibits evidence of water leakage at any place whatsoever, locate the leakage and take measures to correct the leakage as approved by the Engineer. Subsequent to corrective measures, perform the watertightness integrity test subject to the same conditions as the original test.

The words “permanently installed” as used above include completion of the portions of the barrier and deck that cannot be constructed until after the expansion device installed. This applies even though this work is to be paid for under other contract items.

C. Contractor Certification

Provide written certification to the Engineer that the expansion joint device was installed in accordance with the manufacturer’s instructions, the advice of their representative, and these specifications. Also, provide in writing any certification from the joint manufacturer’s representative.

447.4 Measurement

Bridge expansion device will be measured as a unit, completely installed and accepted.

The words “completely installed” mean that the expansion joint device is in place with concrete placed and finished, and that the watertight integrity test has been successfully performed.

447.5 Payment

Each expansion joint device will be paid for at the Contract Price per each, complete in place. Payment will be full compensation for all work necessary to furnish, test, and install a modular expansion device, steel angles, concrete anchorages, placing and finishing concrete in block-outs.

Payment will be made under;

Item No. 447-1050 Modular Expansion Joint, Br No - , Bt No - ……………………………………. per each
DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

SPECIAL PROVISION

PROJECT No:
P. I. NO. 210327-

SECTION 449 – Bridge Deck Joint Seals

Add the following Subsections to Section 449:

449.1 General Description

- A Preformed Pre-compressed, Silicone Coated, Self-Expanding Sealant System

449.2 Materials

J. Preformed Pre-compressed, Silicone Coated, Self-Expanding Sealant System

The preformed pre-compressed silicone joint seal shall as a minimum:

- Sealant systems shall be comprised of three components: 1.) cellular polyurethane foam impregnated with hydrophobic 100% acrylic, water-based emulsion, factory coated with highway-grade, fuel resistant silicone; 2) field-applied epoxy adhesive primer, 3) field-injected silicone sealant bands.
- Be held in place by a non-sag, high modulus silicone adhesive.
- Be compatible with the epoxy and header material.
- Withstand the effects of vertical and lateral movements, skew movements and rotational movement without adhesive or cohesive failure.
- Designed so that, the material is capable of movement of +50%, -50% (100% total) of nominal material size.
- Changes in plane and direction shall be executed using factory fabricated 90 degree transition assemblies. The transitions shall be watertight at the inside and outside corners though the full movement of the product.
- The depth of the joint shall be recessed ½” below the riding surface throughout the normal limits of joint movement.
- Be resistant to ultraviolet rays
- Be resistant to abrasion, oxidation, oils, gasoline, salt, and other materials that may be spilled on or applied to the surface.
- Certify to the Engineer that the joint composition shall be free of any waxes or wax compounds; asphalts or asphalt compounds.
Ensure the joint meets the following physical properties:

<table>
<thead>
<tr>
<th>Test</th>
<th>Requirements</th>
<th>Test Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tensile Strength of Silicone Coating (min)</td>
<td>140 psi</td>
<td>ASTM D 412</td>
</tr>
<tr>
<td>UV Resistance of Joint System</td>
<td>No Changes--2000 Hours</td>
<td>ASTM G155-00A</td>
</tr>
<tr>
<td>Density of Cellular Polyurethane Foam</td>
<td>200kg/m³ (12.5lb/ft³)</td>
<td>ASTM D 545</td>
</tr>
<tr>
<td>Heat Aging Effects (Silicone Coating)</td>
<td>No cracking, chalking</td>
<td>ASTM C 792</td>
</tr>
<tr>
<td>Resilience (Silicone Coating)</td>
<td>≥ 95%</td>
<td>ASTM D 5329</td>
</tr>
<tr>
<td>Joint System Operating temp range (min)</td>
<td>-40° F to 185° F</td>
<td>ASTM C 711</td>
</tr>
</tbody>
</table>

The adhesive shall be a two-component, 100% solid, modified epoxy meeting the requirements of ASTM C 881, Type I, Grade 3, Class B & C. The adhesive shall also have the following properties:

<table>
<thead>
<tr>
<th>Test</th>
<th>Requirements</th>
<th>Test Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tensile Strength</td>
<td>2,500 psi (24 MPa) min.</td>
<td></td>
</tr>
<tr>
<td>Compressive Strength</td>
<td>7000 psi (48 MPa) min.</td>
<td></td>
</tr>
<tr>
<td>Bond Strength (Dry Cure)</td>
<td>2000 psi (28MPa) min</td>
<td></td>
</tr>
<tr>
<td>Water Absorption</td>
<td>0.1% by weight</td>
<td></td>
</tr>
</tbody>
</table>

The silicone band adhesive shall have the following properties:

<table>
<thead>
<tr>
<th>Test</th>
<th>Requirements</th>
<th>Test Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Movement Capability</td>
<td>+100/-50%</td>
<td>ASTM C 719</td>
</tr>
<tr>
<td>Elongation at Break</td>
<td>&gt;1400%</td>
<td>ASTM D 412</td>
</tr>
<tr>
<td>Slump</td>
<td>≤=0.3&quot;</td>
<td>ASTM D 2202</td>
</tr>
<tr>
<td>Hardness (Shore A) max</td>
<td>20</td>
<td>ASTM C 661</td>
</tr>
<tr>
<td>Tack free time (max)</td>
<td>60 minutes</td>
<td>ASTM C 679</td>
</tr>
<tr>
<td>Heat Aging Effects</td>
<td>No cracking, chalking</td>
<td>ASTM C 792</td>
</tr>
<tr>
<td>Resilience</td>
<td>≥ 95%</td>
<td>ASTM D 5329</td>
</tr>
<tr>
<td>Bond</td>
<td>0% Adhesive or Cohesive Failure after 5 cycles @100% extension</td>
<td>ASTM D 5329</td>
</tr>
</tbody>
</table>
449.3.03 Preparation

A. Surface Preparation

2. Preparation for Joint Seal

Delete: “Saw-cutting of the concrete deck may be necessary to provide an acceptable attachment surface for the joint seal.”

449.3.05 Construction

H. Preformed Pre-compressed, Silicone Coated, Self-Expanding Sealant System

1. After the epoxy or elastomeric concrete had developed enough strength to be traffic ready, remove the temporary joint filler (when called for) and thoroughly clean the joint faces of all joint filler.

2. Lightly sandblast the joint to remove all residues. Prior to installation ensure surfaces are completely dry and all recommendations of the manufacture have been completed.

3. Clean the seal prior to installation by wiping it down with a cloth saturated with acetone.

4. Apply epoxy adhesive to substrate in a thin layer inside cleaned substrate.

5. Install the foam length into the wet epoxy adhesive so that the top of the bellows is ½” below the deck surface.

6. Inject a ¾-inch band of Silicone between the substrate and the foam.

7. Tool the excess Silicone and remove excess Silicone from bellows at the joints. Coat any exposed foam ends.

449.5 Payment

Payment will be made under:

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Description</th>
<th>Per Linear Foot (meter)</th>
</tr>
</thead>
<tbody>
<tr>
<td>449</td>
<td>Preformed Pre-compressed, Silicone Coated, Self-Expanding Sealant System, Bridge No - ____ Bent No - ____</td>
<td></td>
</tr>
</tbody>
</table>

Bridge Maintenance
DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

SPECIAL PROVISION

P.I. No: 210327-
Richmond County

SECTION 449 – Bridge Deck Joint Seals

Add the following Subsections to Section 449:

449.1 General Description

• A preformed silicone joint seal, or

449.2 Materials

J. Performed Silicone Joint Seal

The preformed silicone joint seal shall as a minimum:

• Be held in place by a non-sag, high modulus silicone adhesive.
• Be compatible with epoxy and elastomeric concrete header material and steel headers (if required).
• Withstand the effects of vertical and lateral movements, skew movements and rotational movement without adhesive or cohesive failure.
• The depth of the joint shall be recessed below the riding surface throughout the normal limits of joint movement.
• Be resistant to ultraviolet rays
• Be resistant to abrasion, oxidation, oils, gasoline, salt, and other materials that may be spilled on or applied to the surface.
Ensure the joint meets the following physical properties:

<table>
<thead>
<tr>
<th>Test</th>
<th>Requirements</th>
<th>Test Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hardness Type A durometer</td>
<td>53 ± 5</td>
<td>ASTM D 2240</td>
</tr>
<tr>
<td>Tensile Strength (min)</td>
<td>550 psi (3.8 Mpa)</td>
<td>ASTM D 412</td>
</tr>
<tr>
<td>Elongation at break (min)</td>
<td>350%</td>
<td>ASTM D 412</td>
</tr>
<tr>
<td>Tear Strength (min)</td>
<td>80 lb/in (92 kg/cm)</td>
<td>ASTM D 624</td>
</tr>
<tr>
<td>Compression set (max)</td>
<td>30% at 350°F</td>
<td>ASTM D 395</td>
</tr>
<tr>
<td>Operating temp range (min)</td>
<td>-60°F to 450°F (51°C to 232°C)</td>
<td></td>
</tr>
</tbody>
</table>

The adhesive shall also have the following properties:

<table>
<thead>
<tr>
<th>Test</th>
<th>Requirements</th>
<th>Test Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sag/flow (max)</td>
<td>3/16” (4.8 mm)</td>
<td>ASTM C 639</td>
</tr>
<tr>
<td>Hardness</td>
<td>23 ± 3</td>
<td>ASTM C 661</td>
</tr>
<tr>
<td>Tack free time (max)</td>
<td>30 minutes</td>
<td>ASTM C 679</td>
</tr>
<tr>
<td>Skin over time (tooling Time) (max)</td>
<td>5 minutes</td>
<td>AT 75°F/50% RH</td>
</tr>
<tr>
<td>Cure through to ¼” thickness (max)</td>
<td>16 hours</td>
<td>AT 75°F/50% RH</td>
</tr>
<tr>
<td>Resistance to UV</td>
<td>No Degradation</td>
<td>ASTM C 793</td>
</tr>
<tr>
<td>Peel Adhesion to substrates (min)</td>
<td>50 lb/in (58kg/cm)</td>
<td>ASTM C 794</td>
</tr>
</tbody>
</table>

### 449.3.03 Preparation

#### A. Surface Preparation

2. **Preparation for Joint Seal**

Delete: “Saw-cutting of the concrete deck may be necessary to provide an acceptable attachment surface for the joint seal”.
449.3.05 Construction

H. Preformed Silicone Joint Seal

1. After the epoxy or elastomeric concrete has developed enough strength to be traffic ready, remove the temporary joint filler (when called for) and thoroughly clean the joint faces of all joint filler.

2. Lightly sandblast the joint to remove all residues. Prior to installation, ensure surfaces are completely dry and all recommendations of the manufacturer have been completed.

3. Clean the seal prior to installation by wiping it down with a cloth saturated with denatured alcohol.

4. Apply a 3/8” thick bead of adhesive along both sides of the joint at the depth recommended by the manufacturer.

5. Position the joint seal to the proper depth as recommended by the manufacturer.

6. Apply a bead of adhesive along the top side of the joint on each side as recommended by the manufacturer.

7. Tool the adhesive twice to insure complete contact with the vertical edge.

449.5 Payment

Payment will be made under:

<table>
<thead>
<tr>
<th>Item No. 449</th>
<th>Preformed Silicone Joint Seal, Bridge No - _____, Bent No - _____</th>
<th>Per Linear Foot (meter)</th>
</tr>
</thead>
</table>
Delete Subsection 500.1 and substitute the following:

This work consists of manufacturing and using High Performance Portland cement concrete to construct precast-prestressed concrete bridge members as shown in the plans and using normal weight Portland cement concrete to construct structures as shown in the Plans.

Add the following to Subsection 500.1.02.A:

Section 831—Admixtures

Add the following to Subsection 500.1.02.B:

AASHTO T 277

Add the following to Subsection 500.1.03.A:

High Performance Concrete Mix Designs
The Fabricator is responsible for all concrete mix designs. Ensure that concrete mixes contain enough cement to produce workability within the water-cement ratio specified in Table 1A—High Performance Concrete Mix Table, below.

Submit a mix design for approval to the Office of Materials and Research. Include the sources and actual quantity of each ingredient and laboratory results that demonstrate the ability of the design to attain both the required compressive strength and chloride permeability at 56 days.

Include laboratory compressive strength test results of at least eight test cylinders prepared and cured according to AASHTO T 126. Ensure these test cylinders are made from two or more separate batches with an equal number of cylinders made from each batch.

Also include laboratory chloride permeability test results of at least two test specimens prepared and tested according to AASHTO T 277. Ensure these test specimens are made from two or more separate batches with an equal number of specimens made from each batch.
### Table 1A—High Performance Concrete Mix Table

<table>
<thead>
<tr>
<th>Class of Concrete</th>
<th>Coarse Aggregate Size No.</th>
<th>(1) Minimum Cement Factor (lbs/yard³)</th>
<th>Maximum Water/Cement Ratio (lbs/lbs)</th>
<th>(2) Slump Acceptance Limits (in) Lower-Upper</th>
<th>Entrained Air Acceptance Limits (%) Lower-Upper</th>
<th>(3) Minimum Compressive Strength at 56 days (psi)</th>
<th>Maximum Chloride Permeability at 56 days (Coulombs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;AAA HPC&quot;</td>
<td>67</td>
<td>650</td>
<td>.330</td>
<td>2 7</td>
<td>3.5 6.5</td>
<td>Beams – As shown on the Plans Piling – 5000</td>
<td>Beams – 3,000 Piling – 2,000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Class of Concrete</th>
<th>Coarse Aggregate Size No.</th>
<th>(1) Minimum Cement Factor (kg/m³)</th>
<th>Maximum Water/Cement Ratio (kg/kg)</th>
<th>(2) Slump Acceptance Limits (mm) Lower-Upper</th>
<th>Entrained Air Acceptance Limits (%) Lower-Upper</th>
<th>(3) Minimum Compressive Strength at 56 days (MPa)</th>
<th>Maximum Chloride Permeability At 56 days (Coulombs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;AAA HPC&quot;</td>
<td>67</td>
<td>386</td>
<td>.330</td>
<td>50 180</td>
<td>3.5 6.5</td>
<td>Beams – As shown on the Plans Piling – 35</td>
<td>Beams – 3,000 Piling – 2,000</td>
</tr>
</tbody>
</table>

1. Determine the slump acceptance after the addition of high-range water reducer.
2. Determine the minimum compressive strength at 56 days using 4 in. diameter x 8 in. high (100 mm x 200 mm) cylinders.

**Add the following to Subsection 500.2 Table 3:**

- Fly Ash 831.2.03.A.1
- Silica Fume 831.2.03.A.4

**Add the following note to Subsection 500.2 Table 3:**

4. Use Type I or III Portland cement in High Performance concrete. Do not use air-entraining cement.

**Add the following to Subsection 500.3.04.D.4:**

f. For High Performance concrete, fly ash may be used as an additive at an addition rate not to exceed 15% of the cement by weight.

**Add the following to Subsection 500.3.04.D:**

6. Silica Fume

Silica Fume may be used as an additive at an addition rate not to exceed 10% of the cement by weight.
Add the following to Subsection 500.1:
This work consists of manufacturing and using Portland cement concrete with lightweight aggregate to construct structures as shown in the Plans.

Add the following to Subsection 500.1.02.B

ASTM C 567
AASHTO T 96
AASHTO T 104
AASHTO M 195
AASHTO T 196
GDT 32

Add the following to Subsection 500.3.01:
C. ACI Concrete Technician

Provide a GDOT certified ACI Concrete Technician, from an independent GDOT prequalified consultant firm, which is certified to perform Field Testing of Roadway Construction Materials.

Add the following to Subsection 500.3.04.F.1:
f. Lightweight Concrete—Concrete composed of a mixture of cementitious material, normal weight fine aggregate, lightweight coarse aggregate conforming to AASHTO M 195, water and admixtures. All structural lightweight concrete will have a maximum equilibrium density of 115 lbs/ft³ (1840 kg/m³) as determined by ASTM C 567.

g. Lightweight concrete will comply with the applicable requirements of Section 500 of the Standard Specifications. Use GDT 32 or AASHTO T 196 to determine air content of structural lightweight concrete.

Use lightweight coarse aggregate from an approved source or stockpile meeting the requirements of AASHTO M 195 and the Sulfate Soundness (AASHTO T 104) and Los Angeles Abrasion (AASHTO T 96) requirements of Section 800.2. Nominal sizes of lightweight coarse aggregates are as specified in AASHTO M 195 as 3/4, 1/2 or 3/8 in. (19.0, 12.5 or 9.5 mm).

The use of lightweight aggregate in concrete in a particular component of a structure will be shown on the Plans or called for in the specifications.
Add the following to Subsection 500.3.06:

F. Air Content Testing of Structural Lightweight Concrete

Provide testing of structural lightweight concrete per Subsection 500.3.04.F.1.g, and in accordance with test frequencies outlined in the Sampling, Testing and Inspection Quick Guide. Perform air content by a technician meeting the requirements of Subsection 500.3.01.C and who is approved by the Engineer. Submit test results to the Engineer. No separate measurement for payment will be made for testing of structural lightweight concrete.
Add the following to 500.1.03.A:
The Contractor is responsible for all concrete mix designs. Submit a mix design for approval to the Office of Materials and Research. Include the sources, actual quantity of each ingredient, design slump, design air and laboratory results that demonstrate the ability of the design to attain the required compressive strength at 28 days.

Prepare and test at least 8 cylinders according to ASTM C192 and AASHTO T22 to ensure that the demonstrated laboratory compressive strength at 28 days exceeds the minimum acceptance strength (X). Make the specimens from two or more separate batches with an equal number of cylinders made from each batch. The minimum acceptance strength is:

\[ X = f'c + 500 \text{ psi} \]  

Where, \( f'c \) is the required minimum compressive strength at 28 days for Class D concrete as shown in Table 1—Concrete Mix Table.

Add the following to Table 1—Concrete Mix Table:

<table>
<thead>
<tr>
<th></th>
<th>English</th>
<th>Metric</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Class of Concrete</strong></td>
<td>(2) Coarse Aggregate Size No.</td>
<td>(2) Coarse Aggregate Size No.</td>
</tr>
<tr>
<td></td>
<td>(1 &amp; 6) Minimum Cement Factor lbs/yd(^3)</td>
<td>(1 &amp; 6) Minimum Cement Factor kg/m(^3)</td>
</tr>
<tr>
<td></td>
<td>Max Water/Cement Ratio lbs/lbs</td>
<td>Max Water/Cement Ratio kg/kg</td>
</tr>
<tr>
<td></td>
<td>(5) Slump Acceptance Limits (in) Lower - Upper</td>
<td>(5) Slump Acceptance Limits (mm) Lower - Upper</td>
</tr>
<tr>
<td></td>
<td>(3 &amp; 7) Entrained Air Acceptance Limits (%) Lower - Upper</td>
<td>(3 &amp; 7) Entrained Air Acceptance Limits (%) Lower - Upper</td>
</tr>
<tr>
<td></td>
<td>Minimum Compressive Strength at 28 days (psi)</td>
<td>Minimum Compressive Strength at 28 days (MPa)</td>
</tr>
<tr>
<td><strong>Class D</strong></td>
<td>57,67</td>
<td>57,67</td>
</tr>
<tr>
<td></td>
<td>650</td>
<td>386</td>
</tr>
<tr>
<td></td>
<td>0.445</td>
<td>0.445</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>3.5</td>
<td>3.5</td>
</tr>
<tr>
<td></td>
<td>7.0</td>
<td>7.0</td>
</tr>
<tr>
<td></td>
<td>4000</td>
<td>28</td>
</tr>
</tbody>
</table>

Delete Subsection 500.3.04.F.1.b

Add the following to Subsection 500.3.04.F.1:

f. Class D—Bridge superstructure concrete or as called for on the Plans
March 11, 2016

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA
SPECIAL PROVISION

PROJECT NO.:
P.I. NO.: 210327-

Section 500—Concrete Structures

Add the following to Subsection 500.1.02:

B. Referenced Documents

“Guide to Mass Concrete”, ACI 207.1R-05.
“Report on Thermal and Volume Change Effects on Cracking of Mass Concrete”, ACI 207.2R-07.
“Cooling and Insulating Systems for Mass Concrete”, ACI 207.4R-05.
“Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete”, ACI 211.1-91
“Control of Cracking Concrete Structures”, ACI 224R-01.
“Specification of Structural Concrete”, Section 8, ACI 301-10.
“Compressive Strength of Cylindrical Concrete Specimens”, AASHTO T 22-10
“Making and Curing Concrete Test Specimens in the Laboratory”, ASTM C192

Add the following to Subsection 500.3.05:

AM. Mass Concrete

Mass concrete is defined as “Any large volume of concrete with dimensions large enough to require that measures be taken to cope with the generation of heat and attendant volume change to minimize cracking”. Any concrete element with a least plan dimension greater than 5ft (or greater than 6 ft diameter for a drilled shaft) shall be designated as mass concrete and will use this specification. To account for variability in as-built dimension versus plan dimension, such as telescoping casing during construction, any concrete element with a least as-built dimension greater than 5 ½ ft (or great than 6 ½ ft diameter for a drilled shaft) shall be designated as mass concrete and use this specification. The introduction of a construction joint at a dimension less than 5 ft does not ensure that the maximum temperature attained by or the differential temperature in concrete is adequately controlled. Proposals for large volume concrete shall thus be evaluated based on the heat development and a Thermal Control Plan.
a. Temperature Specifications for Mass Concrete

Mass concrete shall conform to the concrete acceptance criteria and the following temperature requirements to prevent delayed ettringite formation (DEF) and thermally induced stress cracks:

1. The maximum allowable internal temperature of mass concrete meeting the requirements of Subsection 500.3.05.AM.b.1, shall not exceed 158 °F.
2. The maximum temperature differential between interior and exterior portions of the designated mass concrete element shall not exceed 35 °F.
3. The maximum temperature of the concrete when delivered and prior to placement shall be 85 °F.

b. Materials Selection and Mix Design Development

Materials used for mass concrete shall conform to the provisions in Section 500-Concrete Structures of GDOT Standard Specifications-Construction of Transportation Systems and the following requirements. When in conflict, materials shall conform to the special provisions below rather than those in Section 500.

1. Use Class F fly ash (no Class C fly ash is allowed), granulated iron blast-furnace slag or other pozzolans, if approved by the Department in all mass concrete. Slag may comprise no more than 75% by mass of total cementitious and pozzolanic materials. Class F fly ash may comprise no more than 40% by mass of total cementitious and pozzolanic materials. When a combination of multiple different pozzolans is used, the total amount may be no more than 75% by mass of total cementitious and pozzolanic materials.

2. High-early-strength (ASTM C150 Type III or ASTM C1157 HE) cement, metakaolin, silica fume calcium chloride and accelerating type admixtures shall not be used unless an adiabatic temperature study is completed showing temperature rise significantly less than that of plain unmodified concrete.

3. A retarding admixture, pretested with the job materials under job conditions, may be permitted to prevent cold joints due to the quantity of concrete placed, as approved by the Engineer.

4. Coarse aggregate larger than #5 stone maximum size aggregate is permitted to be used for mass concrete, if approved by the Engineer.

5. Other materials and/or mix designs may be proposed to the Engineer for approval, with documentation that the proposed mix designs meet temperature specifications from Subsection 500.3.05.AM.a for mass concrete.
6. Laboratory-designed mix proportions of materials are permitted for commonly used combinations of materials. Request these mixes in writing from the State Materials Engineer specifying the class of concrete and the source of ingredients.

7. Degree of Alkali-Silica Reactivity (ASR) of either fine or coarse aggregate is determined by testing the aggregates in ASTM C1260, or ASTM C1567 (either expansion shall be less than 0.10% after 14 days immersion). Unless the results of petrography indicate a significant change in the composition of materials in quarries, ASTM 1293 (expansion <0.04% at 1 year) is not required to be conducted, before a mix design can be approved by the Engineer. Alternatively obtain low ARS risk aggregate materials from certified suppliers.

8. The mixture will be capable of demonstrating a laboratory compressive strength at 28 days meeting the requirements of Table 1 – Concrete Mix Table, Subsection 500.1.03.A. Compressive strength will be determined based upon result of six cylinders prepared and tested in accordance with AASHTO T 22 and ASTM C192.

c. Thermal Control Plan

At least 30 calendar days prior to placing any concrete defined as mass concrete, the contractor shall submit to the Engineer for approval a Thermal Control Plan (TCP). The TCP shall show complete analysis of the anticipated thermal developments in the mass concrete elements for all expected project temperature ranges using the proposed mix design, casting procedures and materials. A primary focus of the TCP is actions to take when any of the temperature controls noted in Subsection 500.3.05.AM are exceeded or are anticipated to be exceeded. As a minimum, the TCP shall include details about the following:

1. Concrete mix design showing composition, proportions, and sources for all components.
2. Proposed methods to control concrete temperature at time of placement, such as pre-cooling of raw materials or concrete.
3. Duration and method of curing.
4. Calculations of maximum concrete temperatures for the range of expected air, water (for underwater construction) and concrete temperatures.
5. Proposed methods to control maximum temperature during curing. A mechanical cooling system may be used to control the internal temperature of mass concrete during curing but shall be designed in conformance with the Thermal Control Plan. If a mechanical cooling system is used, the plans for the cooling system operation and final grouting after cooling shall be submitted to the Engineer for approval.
6. When the maximum concrete temperature nears 140 °F, notify the Engineer and take corrective measures immediately to retard further increase in the temperature to limit it to the 158 °F maximum. Utilize the mechanical cooling system, if installed, to lower the overall temperature. Other active measures may include, but not limited to
for any further pours: chilled water for mixing, precooling aggregate stockpiles, ice for mixing water, nitrogen gas, and shade for aggregate stockpiles. Cease placement of concrete until the maximum temperature has been lowered.

7. Proposed methods to control temperature differentials during curing that could include insulation for the forms and exposed portions of concrete. Contractor must take actions that prevent the exterior surfaces of the concrete from getting too cool, too quickly such as using insulation or heater or by preventing the core from getting too hot.

8. When the internal concrete temperature differential between interior and exterior concrete nears 30°F, notify the Engineer and take corrective measures immediately to retard further increase in the temperature differential to limit it to the 35°F maximum. Utilize the mechanical cooling system, if being use, to lower the internal temperature. Other active measures may include, but not limited to: chilled water for mixing, precooling aggregate stockpiles, ice for mixing water, nitrogen gas, and shade for aggregate stockpiles. Cease placement of concrete until the temperature differential has been lowered.

9. Calculations of maximum temperature gradients within each concrete element during curing. Calculations shall include maximum possible temperature induced tensile stress in the concrete in addition to tensile stresses at 1 day, 3 days, 7 days, 28 days, and 56 days after placement. The thermal calculation model and/or computational software shall be submitted to the Engineer for approval.

10. Temperature monitoring and recording system, that shall consist of temperature sensors connected to a data acquisition system. The temperature sensor types and locations shall be specified.

11. Results of strength tests of sample cylinders. The concrete shall attain the specified strength at an age (28 or 56 days) as specified by the Engineer. Match curing of concrete is required. Match curing shall be conducted according to temperature history obtained using thermocouples typically 4 inches from surface and at the centroid of the concrete pour. The depth of the thermocouple may need to be established by the depth of rebar or other anchoring structure (See Subsection 500.3.05.AM.d.3 and Subsection 500.3.05.AM.d.5).

12. For all mass concrete construction, the TCP shall be developed by a Professional Engineer, licensed in the State of Georgia, who shall be competent in the modeling, design, and temperature control of mass concrete with at least three mass concrete projects experience that can be verified by the Department.

Place no concrete until the mass concrete mix design and the proposed TCP is reviewed and approved by the Engineer. If concrete design mixture is changed, the TCP must be updated and approved by the Engineer.

d. Temperature Monitoring and Recording System

1. Install within the concrete placed in each mass pour and in the surrounding environment of the concrete, temperature sensing devices (thermocouples) of a type approved by and at locations based on the plan approved by the Engineer.
2. The sensing system will contain as a minimum two independent sets of sensing devices in order to assure readings if one of the systems fail. The sensing devices shall be accurate to within 2°F range.

3. Thermocouples shall be placed at the centroid of the pour, or wherever the point of expected maximum temperature is anticipated. Additional thermocouples shall be placed on the exterior to monitor the maximum temperature differential. Ensure the thermocouples are placed at a depth of 2 to 6 inches below the surface.

4. The temperature monitoring and recording system for mass concrete shall consist of temperature sensors connected to a data acquisition system capable of printing, storing, and downloading data to a computer. Data shall be printed and submitted to the Engineer daily with a copy sent to Office of Materials and Testing.

5. Two independent sets of sensing devices shall be placed at each of the following locations and readings to be taken hourly: (1) center of the mass pour; (2) midpoint of the side which is the shortest distance from the center; (3) midpoint of the top surface; (4) midpoint of the bottom surface; and (5) corner of the mass pour which is furthest distance from the center. Ensure the thermocouples are placed at a depth of 2 to 6 inches below the surface.

e. Placing and Curing Mass Concrete

When placing and curing mass concrete do the following:

1. Maintain a temperature differential of 35 °F or less between the interior and exterior portions of the designated mass elements.

2. Monitor and maintain records of the concrete temperature, beginning with casting and continuing until the maximum temperature is reached and begins decreasing to a differential of no more than 35°F from the mean annual ambient temperature of the surrounding environment, for three consecutive days.

3. The contractor shall suggest consolidation techniques based on the placement technique to be used for mass concrete. The consolidation technique shall be reviewed and approved by the Engineer before start of placement of mass concrete. Slump tests or slump-flow (ASTM C 1611) tests, as applicable, shall be used to provide quality control from batch to batch.

4. Maintain a minimum concrete placement rate of 30 cubic yards per hour or as designated on the plans or in the Special Provisions. Any requested change from this placement rate is to be approved by the Engineer.

f. Acceptance

Mass concrete shall conform to the concrete acceptance criteria and the temperature requirements as stated earlier to prevent delayed ettringite formation (DEF) and thermally induced stress cracks.
If the Contractor fails to conform to any of the above temperature requirements in any one pour, any additional mass concrete pours will cease. The Engineer may, at its sole discretion, direct that the concrete be removed or otherwise mitigated, at no cost to the Department. The contractor shall revise the Thermal Control Plan and design calculations to correct the problem and resubmit the revised Thermal Control Plan. Mass concrete placement shall not begin until the Engineer has approved the revised Thermal Control Plan. No extension of time or compensation will be made for any rejected mass concrete element or revisions of the Thermal Control Plan.

Office of Materials and Testing
Section 511 – Reinforcement Steel

Add the following to 511.2 Materials, B. Fabrication:

2. Reinforcement Steel Couplers. When couplers are indicated on the Plans, use mechanical butt splices from an approved source listed on QPL 93.

Provide mechanical butt splices which develop a minimum of 125% of the guaranteed yield strength of the reinforcing steel to be spliced. Limit the total slip of the reinforcing bars within the splice sleeve after loading to 30 kips per square inch (207 MPa) and relaxing to 3 kips per square inch (21 MPa) to no more than the following, as measured between gauge points clear of the splice sleeve: 0.010 of an inch (.25mm) for reinforcing bars no. 14 (43) or smaller, or 0.030 of an inch (.76mm) for reinforcing bars no. 18 (57).

Prior to installation on GDOT projects, the contractor is required to submit job-control samples for testing to the Office of Materials and Testing. This is to ensure that the installer is qualified to construct the units. Make test specimens in the presence of the Engineer or his authorized representative using reinforcing steel consigned for the work. A test specimen consists of a splice made at the job site to connect two 24 inch (600mm) or longer bars using the same splice materials, position, location, and equipment, and following the same procedures to be used to make splices in the work. Prior to incorporating couplers into the work, make and test three specimens that meet the above criteria.

Perform all testing required above by the Office of Materials and Testing or at a testing laboratory approved by the Department.

If threaded couplers are used, equip them with approved devices which will prevent rotation after installation. After installation, clean all couplers with a power wire brush or by other approved methods and recoat the couplers with a material prepared and recommended by the coating manufacturer.

Install the couplers in strict accordance with the manufacturer’s instructions and as approved by the Engineer.

All costs for the couplers, test samples (including reinforcing steel for tests) and testing of couplers shall be included in the costs of reinforcing steel.
Delete Section 581 in its entirety and add the following:

Disc Bearings

581.1 General Description
This work includes furnishing and installing disc bearings (fixed and expansion types). Use the quality, type, and size designated in this Specification, on the Plans, or ordered by the Engineer.

581.1.01 Definitions
General Provisions 101 through 150.

581.1.02 Related References
A. Standard Specifications
   Section 501—Steel Structures
   Section 506—Expanded Mortar
   Section 535—Painting Structures
   Section 851—Structural Steel
   Section 852—Miscellaneous Steel Materials
   Section 885—Elastomeric Bearing Pads
   Section 886—Epoxy Resin Adhesives
   Section 887—Bearing Plates with Polytetrafluoroethylene Surfaces
B. Referenced Documents
   ASTM A 709 Grade 36 (ASTM A 709M Grade 250)
Section 581—Pot Bearings

A 709 Grade 50 (A 709M Grade 345)

581.1.03 Submittals
Provide the following reports to the Project Engineer and the Office of Materials:

- Certified test reports
- Materials certificates
- Certificate of Compliance to conform with the requirements in this Specification
- Shop drawings
- Certification

A. Shop Drawings
Before fabricating the bearings, submit to the Engineer Shop Drawings according to Subsection 501.1.03.B, “Shop Drawings.” Include the following on the drawings:

- Bearing plan and elevation
- Complete details and sections that show the materials incorporated into the bearing
- ASTM or other material designations
- Vertical and horizontal load capacity
- Rotation and translation capacity
- Compression stress on sliding surfaces and elastomeric surfaces at maximum and minimum design loads
- Complete design calculations
- Complete erection and installation procedure

B. Certification
Have the disc bearing manufacturer furnish the following to the Project Engineer and the Office of Materials:

- Certified test reports
- Material certificates
- Certificate of compliance to conform with these Specifications for each bearing furnished

581.2 Materials
Ensure that materials meet the requirements of the following Specifications:

<table>
<thead>
<tr>
<th>Material</th>
<th>Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>Painting</td>
<td>535</td>
</tr>
<tr>
<td>Structural Steel</td>
<td>851</td>
</tr>
<tr>
<td>Anchor Bolts, Nuts, and Washers</td>
<td>852.2.02</td>
</tr>
<tr>
<td>Elastomeric Bearing Pads</td>
<td>885</td>
</tr>
<tr>
<td>Epoxy Resin Adhesives</td>
<td>886</td>
</tr>
<tr>
<td>Bearing Plates with PTFE Surfaces</td>
<td>887</td>
</tr>
</tbody>
</table>

A. Metals
Use the stainless steel sliding surfaces indicated below:
Section 581—Pot Bearings

- **Stainless Clad Steel Plate**: Minimum eight percent stainless steel conforming to the requirements of ASTM A 264 (both Shear Strength and Bond Strength tests in 8.13 and 8.14 of ASTM A 264 are required). Use stainless steel cladding that meets Type 304. Use backing steel (base metal) that meets ASTM Designation A 709 Grade 50W (A 709M, Grade 345 W).

- **Stainless Steel Plate Welded To A Steel Backup Plate**: Use at least 16 gage (1.6 mm) thickness of the stainless steel plate that meets ASTM 240 Type 304. Use steel backing plate that meets ASTM Designation A 709 Grade 50W (A 709M Grade 345W) unless otherwise indicated on the Plans. Use qualified welders to weld the stainless steel plate to the steel backing. Furnish welding procedures and welder qualification documents to the Department for review and approval prior to fabrication. Weld entirely around the perimeter of the stainless steel plate.

- **Solid Stainless Steel Plate**: Mill-finish the stainless steel sliding surfaces to a maximum surface roughness of 20 micro-inches (0.50\(\mu\)m), RMS, according to the requirements of ANSI Standard B 46.1. Remove and replace, at no additional cost to the Department, bearing plates whose stainless steel sliding surfaces have been scratched or damaged.

B. Structural Steel

Use structural steel for the masonry plates and the components of the bearings that meet the requirements of these ASTM Specifications:

- ASTM A 709, Grade 36 (ASTM A 709M, Grade 250)
- A 709, Grade 50 (A 709M, Grade 345)

Machine the steel plates confining the disc from solid steel plates.

C. Anchor Bolts

Use anchor bolts, including nuts and washers, that meet the requirements of Subsection 852.2.02.

D. Polyether Urethane Elastomeric Disc

Ensure that the disc material is 100 percent polyether urethane meeting the following Specifications:

<table>
<thead>
<tr>
<th>Property</th>
<th>Test Method</th>
<th>Range of Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hardness, Durometer D</td>
<td>ASTM D 2240</td>
<td>62 + or -2</td>
</tr>
<tr>
<td>Tensile Stress psi</td>
<td>ASTM D 412</td>
<td>2,030 minimum</td>
</tr>
<tr>
<td>at 100% elongation</td>
<td>Pull at 20 in/min.</td>
<td>3,771 minimum</td>
</tr>
<tr>
<td>at 200% elongation</td>
<td>(pulled at 8.5 mm/s)</td>
<td>(14 minimum)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(26 minimum)</td>
</tr>
<tr>
<td>Tensile Strength</td>
<td>ASTM D 412</td>
<td>5,000 minimum</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(34.5 minimum)</td>
</tr>
<tr>
<td>Ultimate Elongation, %</td>
<td>ASTM D 412</td>
<td>220 minimum</td>
</tr>
<tr>
<td>Compression Set, 22 hours</td>
<td>ASTM D 395</td>
<td>40% maximum</td>
</tr>
<tr>
<td>at 159 degrees F., %</td>
<td></td>
<td>(71⁰C, %)</td>
</tr>
<tr>
<td>(71⁰C, %)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Compression Strain, %</td>
<td></td>
<td></td>
</tr>
<tr>
<td>at 5,000 psi stress*</td>
<td></td>
<td>Strain %</td>
</tr>
<tr>
<td>(35 MPa)</td>
<td></td>
<td>8.0 min 15.0 max</td>
</tr>
</tbody>
</table>
Section 581—Pot Bearings

* Compression stress is based on the net plan area of the rotational element and the compressive strain is the percentage of the original thickness. Gross bearing dimensions shall have a tolerance of -0 inch to + 1/8 inch (-0 mm to +3 mm).

E. Shear Restriction Mechanism

Design a shear restriction mechanism to take horizontal forces at all possible vertical loads that consists of a pin connected to the bottom plate and a ring connected to the upper bearing plate.

F. Expanded Mortar

Set anchor bolts in preformed or drilled holes using expanding mortar that meets the requirements of Section 506.

G. Paint

Paint exposed steel of each bearing assembly other than stainless steel according to System VI of Section 535. Take care to keep Polytetrafluroethylene (PTFE) or sliding surfaces free of paint.

H. Design and Applicable Codes

Design, fabricate, and erect disc bearings according to these Specifications and the applicable requirements of the following Standard Codes and Specifications:

- Section 501, including supplements
- Current AASHTO Standard Specifications for Highway Bridges

Additional design parameters with which the disc bearing manufacturer must comply:

1. **Bearing on Concrete:** Maximum bearing pressure is as indicated in AASHTO.
2. **Polyether Urethane Disc:** Design compressive strength is 5000 psi (35 MPa).
3. **Virgin PTFE:** Design compressive strength is 3,500 psi (25 MPa).
4. **Sliding Surfaces:** Accommodate translation by sliding of a hard mating surface of stainless steel across a PTFE surface.
   a. **Stainless Steel Sliding Surface:** Accurate, flat surface with Brinnell hardness of 125 minimum.
      1) Stainless steel sliding surface to completely cover PTFE surface in all operating positions of the bearing.
      2) Position the stainless steel sliding surface so that the sliding movement causes the dirt and dust accumulation to fall from the surface of the stainless steel.
   b. **PTFE Sliding Surface:** Do not use holes or slots in the PTFE sliding surface.
   c. **Static Coefficient of Friction:** Under a load of 3,500 psi (25 MPa), do not exceed 4 percent for unfilled PTFE nor 8 percent of filled PTFE surfaces.
   d. **Rotation:** 0.03 radians maximum.

I. Substituted Bearings

Disc bearings may be substituted for the bearings shown on the Plans provided the bearings to be substituted are approved by the State Bridge Engineer and comply with the following:

1. Equal or better load carrying and moment capacity.
2. All control dimensions are maintained and bearings fit within the limits of detailed masonry plate.
3. Use filled or unfilled (recessed) PTFE.
4. Use Polyether Urethane disc material as a medium within the shear restricted disc bearing.
5. The Polyether Urethane disc shall be lined with PTFE on the bottom side of expansion guided bearings.
6. Do not use aluminum or aluminum alloy.
Section 581—Pot Bearings

7. Equal or better than the pot bearings shown on the Plans in all structural respects and meets all design requirements.

581.2.01 Delivery, Storage, and Handling

A. Assembling and Marking

Have each disc bearing assembled at the plant, marked for identification, and delivered to the construction site as a complete unit.

Mark each bearing with permanent match-marks to indicate the normal position of the bearing.

B. Transportation, Storage, and Handling During Construction

Follow these guidelines to transport, store, and handle disc bearings during construction:

1. Protect each disc bearing from dust and moisture.
2. Store the PTFE surface in the shade to avoid the damaging effects of ultraviolet rays.
3. Protect the disc bearings from damage during construction and prevent contamination of the various components of the disc bearings.

Ensure that the Fabricator also follows the above requirements.

During transportation and storage, cover the bearings with moisture-proof and dust-proof covers.

581.3 Construction Requirements

581.3.01 Personnel

A. Skilled Representative

Have the bearing manufacturer provide a skilled representative who is certified by the manufacturer to be experienced in similar installations.

The representative shall:

- Give aid and instruction during the disc bearing installation.
- Be present during the initial bearing installation.
- Be present during welding of the lower steel plates to the masonry plates, if not performed in the manufacturer’s shop.
- Remain on the job until the bearing installation proceeds without trouble and until the workmen are experienced with the work for each installation as determined by the Engineer.

Arrange to have the manufacturer’s skilled representative present whenever requested by the Engineer.

581.3.02 Equipment

General Provisions 101 through 150.

581.3.03 Preparation

General Provisions 101 through 150.

581.3.04 Fabrication

A. Polytetrafluoroethylene (PTFE)

Ensure that the PTFE, including its connection to its backup material, conforms with the requirements of Section 887, except as modified in this Specification.
Section 581—Pot Bearings

Have the PTFE sliding surface bonded under factory controlled conditions to a rigid backup material that can resist bending stresses of the sliding surfaces.

As an alternate, PTFE material of twice the thickness specified above may be recessed for half its thickness in the backup material. Ensure that it is at least 1/8 in (3 mm) thick and that the PTFE sliding surface is bonded under factory controlled conditions.

1. When shown on the Plans, weld the lower steel plate to the masonry plate before installing the disc.
   - If welding procedures established and approved by the Engineer restrict the temperature of the bond area to no greater than 300 °F (150 °C), welding to steel plates with a bonded PTFE surface is permitted.
   - Use temperature-indicating wax pencils or other suitable means to determine the temperature.

2. After fabricating the backup material, plane it before bonding the stainless steel or PTFE to a true plane surface.

3. Have the PTFE sheets bonded at the bearing manufacturer’s factory under controlled conditions in accordance with the written instructions of the manufacturer of the approved adhesive system.

4. When epoxy bonding PTFE sheets, ensure that the side of the PTFE sheet to be bonded to the metal is factory treated by the sodium naphthalene or sodium ammonia process.

5. After the bonding operation, ensure that the PTFE surface is smooth, flat, and bubble free. Polish the filled PTFE surfaces.

6. Positively locate the elements of the bearing in the bearing manufacturing and assembling.

7. If using bearings other than those detailed on the Plans, obtain approval before constructing the substructure upon which the bearings will be installed.

8. Have each bearing assembled at the manufacturer’s plant, marked for identification, and delivered to the construction site as a complete unit.
   - Ensure that the bearings have permanent match-marks to indicate the normal position of the bearing.

581.3.05 Construction

A. Erection

Place bearings at their proper locations before erecting the superstructure supported by the bearings.

1. Install Pier Tops
   - Install pier tops horizontal at the correct elevation with a plus or minus tolerance of zero. Do not install the masonry plates until the Engineer accepts the pier tops.

2. Install the Anchor Bolts
   - Cast anchor bolts in the concrete or set them in preformed holes, unless otherwise shown on the Plans. If setting them in preformed holes, fill the preformed holes in the concrete substructure with epoxy grout.
     a. Insert the anchor bolts to the prescribed depth.
     b. Place additional grout as required in the annular space around the anchor bolts until the grout is well packed and flush with the top surface of the concrete.
     c. Wipe clean the exposed surfaces of the anchor bolts and substructure. Do not allow a load on grout that has not been in place at least 7 days.

3. Install Masonry Plates
   - Set the masonry plates to the proper elevation on the previously finished concrete pads.

4. Install the Bearings
   a. Place the bearing at the predetermined locations when erecting the superstructure.
   b. Remove the temporary restraints as directed by the bearing manufacturer.
   c. Adjust the bearings as follows:
• Adjust the expansion bearings from the normal position at 60 °F (15 °C) to allow for the ambient temperature during erection or casting.
• Adjust the disc bearings to allow them to move when dead loads are applied. Ensure that the bearing is properly positioned and parallel (free from rotation) after applying the dead load.
• Adjust the bearings horizontally on the masonry plate to properly fit the superstructure members being erected.

After adjustments and approval by the Engineer, weld the bearings to the masonry plate.

581.3.06 Quality Acceptance

Instruct the manufacturer to furnish facilities to test and inspect the completed bearings in the plant or at an independent test facility. An approved testing laboratory or the manufacturer supervised by an approved independent expert shall perform the testing.

Follow these testing guidelines:

• Instruct the manufacturer to allow the Engineer and Inspectors access to the plant and test facilities.
• Furnish certified test reports, materials certificates, and a certificate of compliance to conform with the requirements in the Specifications.
• Perform testing according to Section 887 and this Specification. The Department reserves the right to sample and test the material and disc bearing assemblies as shown in Section 106.
• Test complete bearing assemblies or a specially manufactured disc bearing prototype that has a capacity of 400 kips (181 000 kg).

Successfully tested full-size bearings that meet the requirements of this subsection and have no damaged components, finishes, or surfaces may be used in construction. Provide prototype disc bearings, if used, at no additional expense to the Department.

Specific Items tested are as follows:

A. Coefficient of Friction

Perform tests to determine the static coefficient of friction of the first movement under a load of 3,500 psi (25 MPa) on a disc area applied continuously for 12 hours before testing. Determine under a load of 2,000 psi (14 MPa) on a disc area the following:

1. The static coefficient of friction value shall not exceed 10 percent for filled PTFE surfaces and 6 percent for unfilled PTFE surfaces.
2. The first movement static and dynamic coefficient of friction at a sliding speed of less than 1 in per min (0.4 mm per sec). Values shall not exceed 10 percent for filled PTFE surfaces and 6 percent for unfilled PTFE surfaces.
3. The static and dynamic coefficient of friction is determined after the bearing is subjected to 100 design movements at a speed of less than 1 ft per min (5 mm per sec). Values shall not exceed those indicated in step 2 above. Signs of bond failure or other defects are cause for disc bearing rejection.

B. Proof Loading

Perform, under maximum design loads, proof loading and compression deflection tests on a full-size disc bearing.

C. Rotation

The Polyether Urethane element shall be capable of retaining initial contact with the steel bearing plates through the rotational range under a compressive load equal in magnitude to the design load.
Section 581—Pot Bearings

D. Cold Flow

Subject an approved sample of filled PTFE or unfilled PTFE to a static pressure of 3,500 psi (25 MPa) for at least 24 hours. Ensure that the PTFE material is bonded or mechanically connected to its backup material in the same way as the disc bearing.

Apparent cold flow of the PTFE material is cause for disc bearing rejection.

581.3.07 Contractor Warranty and Maintenance

General Provisions 101 through 150.

581.4 Measurement

Disc bearing assemblies are measured by Lump Sum for each bridge. Determine the actual quantities required before submitting the bid.

581.4.01 Limits

General Provisions 101 through 150.

581.5 Payment

The work in this Specification will be paid for on a Lump Sum basis.

Payment is full compensation for:

- Furnishing materials and equipment including structural steel components of the bearings, masonry plates, top plates, sole plates, PTFE, Polyether Urethane Disc, anchor bolts, and welding
- Designing the disc bearing
- Performing tests
- Furnishing prototype bearings and test samples
- Performing Work as described and specified in this Specification or the Plans
- Providing incidentals to complete the work

Payment will be made under:

<table>
<thead>
<tr>
<th>Item No. 581</th>
<th>Pot bearings, bridge No.</th>
<th>Per lump sum</th>
</tr>
</thead>
</table>

581.5.01 Adjustments

General Provisions 101 through 150.
Delete Subsection 865.1 and substitute the following:

This section includes the following requirements for precast-prestressed concrete bridge members and piling using High Performance Portland cement concrete as shown in the Plans:

- Manufacturing
- Inspecting
- Testing
- Marking
- Painting
- Rubbing as specified
- Plant handling
- Storing
- Shipping

The term “precast-prestressed concrete” is referred to as “prestressed concrete” in the rest of this Section.

Add the following to Subsection 865.2:

<table>
<thead>
<tr>
<th>Material</th>
<th>Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concrete, Class AAA HPC</td>
<td>500</td>
</tr>
</tbody>
</table>

Add the following to the end of Subsection 865.2.01.B.7.a.6:

Optional Method of Curing for Release Strengths with HPC: Temperature match curing (“Sure Cure” or equivalent methods) is allowed for specimens used to determine when stress may be transferred to the concrete for High Performance Concrete Units.
Georgia Department of Transportation

Technical Provisions

For

Design-Build Agreement

P.I. No. 210327-

Attachment 16-1

CONCEPTUAL SIGNAGE PLAN
Conceptual Signage Plan

I-20 at Savannah River
P.I. Number 0210327
Page 2 of 2
Georgia Department of Transportation

Technical Provisions

For
Design-Build Agreement
P.I. No. 210327-

Attachment 17-1

SPECIAL PROVISION FOR NAVIGATOR ATMS INTEGRATION

SP 940 NaviGAtor Advanced Transportation Management System Integration
DEPARTMENT OF TRANSPORTATION  
STATE OF GEORGIA  

SPECIAL PROVISION

Section 940 - NaviGAtor Advanced Transportation Management System Integration

Add the following:

940.1 General Description

This work includes coordination and integration of the project into the Department’s NaviGAtor advanced transportation management system to provide a complete and fully operational expansion of the Department’s NaviGAtor systems as shown in the Contract Documents.

An example project follows:

Project scope includes installation of communications and field equipment that will provide information to the Transportation Management Center (TMC) and other facilities. The backbone of the communication system is a fiber optic cable infrastructure utilizing IP protocols over Ethernet technology. Ethernet switching equipment is used to transport the data from field devices to hub buildings. Routing equipment at the hub-building routes the data to the TMC and other facilities as needed. Cameras will provide video for traffic surveillance and vehicle detection. Changeable message signs and surveillance cameras will be controlled from the TMC. Ramp Metering Operation will communicate with the NaviGAtor System using center-to-center communication between NaviGAtor and ACTRA. ACTRA will communicate to the Ramp Metering firmware.

Each hub-building and assigned field devices are configured as an IP subnet within the GDOT overall network. Each field device (VDS processor, CMS controller, video encoder and decoder) incorporates its own IP address. Each field device will connect to a field switch at the equipment cabinet. The field switches (located in the equipment cabinets) will be daisy-chained using GBIC optical links to form a string. The ends of the daisy-chained switches are terminated at different hub buildings.

Make communications between the surveillance cameras and the network by means of Ethernet video encoders as shown on the Plans. Make communications from the VDS sites by means of Ethernet compatible video detection system processor(s) at each VDS site. Make communications between the CMS and the network by means of CMS controllers incorporating Ethernet ports. Make communication between the ramp metering operations and the network using an Ethernet field switch within the Ramp Meter Controller Cabinet.

At the hubs buildings, data communication arrives through the field switches using Layer 2 protocols. At the hub building routers will disseminate the data as needed across the backbone network.

Video decoders will be used for decoding of the video images at specific locations as shown on Project Plans.
At Project completion, a complete and useable system comprised of all components involved in the Project will be established.

940.1.1 Related References

A. Georgia Standard Specifications
Section 631 – Permanent Changeable Message Signs
Section 647 – Traffic Signal Installation
Section 797 – Hub Buildings
Section 925 – Traffic Signal Equipment
Section 935 – Fiber Optic System
Section 936 – Closed Circuit Television System (CCTV)
Section 937 – Video Detection System
Section 938 – Microwave Radar Detection
Section 939 – Communication and Electronic Equipment

B. Referenced Documents
Not applicable

940.1.2 Submittals
Submit six copies of the Integration Plan to the Engineer within 15 days of Contract Notice to Proceed. Submit six copies of the Acceptance Test Plan to the Engineer within 45 days of Contract Notice to Proceed.

940.2 Materials
Not applicable

940.3 Construction Requirements
Not applicable

940.3.1 Personnel
Not applicable

940.3.2 Equipment
Not applicable

940.3.3 Preparation
Not applicable
940.3.4 Fabrication

Not applicable

940.3.5 Construction

Not applicable

940.3.6 Quality Acceptance

If, in the Department’s judgement, the Contractor is not demonstrating progress in solving any technical problem, the Contractor may be directed to supply Factory technical representation and diagnostic equipment at no cost to the Department until satisfactory resolution of those defined problems.

The Engineer may direct any completed or partially completed portions of the project placed in service. Such action cannot be deemed an acceptance of the project in whole or in part, nor shall such action be construed as a waiver by the Engineer of any provision of the specifications. Assume no right to additional compensation or extension of time for completion of the work. Fully maintain all equipment until final acceptance, which includes but is not limited to equipment configuration and communication systems that are being integrated.

Perform all acceptance testing in the presence of the Engineer. Notify the Engineer of a desired acceptance test no less than fourteen calendar days prior to beginning the testing except for testing using the NaviGAtor software and existing NaviGAtor control center and communications equipment. For acceptance testing using the NaviGAtor software and existing NaviGAtor control center and communications equipment, coordinate the testing schedule with the Engineer no less than 30 days prior to the start of this testing. Do not conduct any testing during any State or Federal holiday.

Ramp Meter Testing

The Contractor shall submit to and obtain approval from the Engineer a ramp metering testing procedure for each specific ramp meter location. The testing procedure shall demonstrate that all components: hardware, cable, and connections furnished and installed by the contractor operates correctly and that all functions are in conformance with the specifications. Testing requirements are also outlined in Section 647.

The Department will provide controller firmware. The Contractor shall provide the controller to the Department. The Department will load the firmware into the controller and return to the Contractor.

At a minimum, the Contractor shall demonstrate to the Engineer:

- The I-VDS and loop detectors at each location are functioning with expected accuracy as specified.
- The ramp meter signals function properly at all stages, including non-metering, startup, metering, and shutdown.
- In multi-lane configurations, the ramp meter can operate a simultaneous release of vehicles from all lanes and as well as an alternating or staggered release of vehicles from the two (or three) lanes.
- Queue detectors are functioning as specified, including both queue detection and queue override.
- The ramp meter functions properly for both local traffic responsive and time of day operations.
- The advance warning sign can be clearly seen and can be activated and deactivated properly.
- The ramp meter can communicate properly with the Hub/TMC.
- The traffic enforcement heads are operating as per the plans and can be seen by enforcement personnel.
The Contractor shall coordinate closely with the NaviGAtor system integrator for conducting ramp meter operational tests. Note: Pretest should be performed prior to calling the Engineer for inspection. Pretest shall be defined as all tests that will be performed during the Engineer’s inspection. Begin operational tests after the Engineer is satisfied that all work has been completed. After the ramp meter has been placed in operation, the contractor, in coordination with the system integrator, shall demonstrate that all equipment furnished and installed by the Contractor operates with all software and firmware as specified.

After successful completion of the test procedure, each ramp meter assembly shall go through a burn-in period for 30 consecutive days of normal ramp metering operations. During the burn-in period, the Contractor shall ensure that all Contractor-supplied equipment operates without failures of any type. If any equipment component malfunctions or fails to provide the specified functionality during the 30-day burn-in period, the Contractor shall replace or repair the defective equipment within 48 hours of notification by the Engineer.

After the malfunctioning component(s) have been repaired or replaced to the satisfaction of the Engineer, the Contractor shall begin a new 30-day burn-in period. The new 30-day burn-in periods shall apply only to equipment components supplied by the Contractor. In the event of a failure or malfunctioning of equipment furnished by others which prevents the 30-day burn-in test from continuing, the Engineer will suspend the burn-in test and resume when the other equipment failures are corrected.

940.3.7 Contractor Warranty and Maintenance
Not applicable

940.3.8 Training
Not applicable

940.4 Measurement

The Department will pay all costs of coordination with and integration of the project into NaviGAtor under the integration pay item when the pay item is included in the Contract. The integration pay item is measured as a lump sum for all supplies, materials and subsistence it requires.

When the integration pay item is not included in the Contract, all costs of coordination with and integration of the project into NaviGAtor with all supplies, materials and subsistence it requires shall be included in other Contract items. The Department will make no separate payment for integration.

940.4.01 Limits
Not applicable

940.5 Payment

The Department will pay for integration that is complete, in place and accepted by the Department. Payment is full compensation for the work.

Payment for Section 940 is made under:

<table>
<thead>
<tr>
<th>Item No. 940</th>
<th>Integration</th>
<th>Lump Sum</th>
</tr>
</thead>
</table>

– or –

Not applicable [when the Integration pay item is not included on the job.]
940.5.01 Adjustments

Not applicable
Georgia Department of Transportation

Technical Provisions

For

Design-Build Agreement

P.I. No. 210327-

Attachment 17-2

SUPPLEMENTAL SPECIFICATIONS

SS 926 Wireless Communications System
SS 694 Weather Monitoring and Reporting System
SS 936 Closed-Circuit Television (CCTV) Camera System
SS 939 Communications and Electronic Equipment
Delete Section 694 in its entirety and substitute the following:

694.1 General Description
Furnish, install, test, and provide warranty and training for a weather monitoring and reporting system comprised of equipment and materials as specified herein and shown in the Contract documents.

694.1.01 Definitions, Acronyms, and Abbreviations
A. Definitions
1. ESS, Type 1: a stationary ESS with RPU and environmental sensors mounted on an existing or new structure or pole and/or installed on the surface.
2. ESS, Type 2: same as Type 1 except with solar power system.
3. ESS, Type 3: a mobile ESS with sensors mounted on vehicle and wireless communications.
4. RPU: a processor that collects, pre-processes, and archives ESS sensor and device data.
5. Watch-Dog: built-in circuitry and capability for a system or equipment to monitor and detect failures or issues.
B. Acronyms and Abbreviations
Refer to Sections 101.01 and 942.1.01.B for a list of acronyms, abbreviations, and terminology used in this section.

694.1.02 Related References
A. GDOT Standard Specifications
1. Section 639 – Strain Poles for Overhead Sign and Signal Assemblies
2. Section 682 – Electrical Wire, Cable, and Conduit
3. Section 926 – Wireless Communications Equipment
4. Section 939 – Communications and Electronic Equipment
5. Section 942 – ITS General Requirements
B. Referenced Documents
1. Refer to Section 942.1.02.B for a list of standards and documents referenced in this section.

694.1.03 Submittals
Refer to Section 942.1.04 for submittal requirements. Requirements for ESS equipment, components, and materials are specified herein.
Section 694—Weather Monitoring and Reporting System

694.2 Materials

694.2.01 Weather Monitoring and Reporting System Requirements

A. General

1. Comply with ISO 9001 or Sigma Six quality manufacturing requirements.

2. Provide only equipment and materials that are new and of like kind and function provided by one manufacturer, using the same model, part number, revision, and firmware for each type of sensor as shown and specified in the Contract documents.

3. Provide weather monitoring and reporting system components that are capable of interoperability and connectivity with the existing statewide ESS system and GDOT Central Software.

B. ESS Sensor

1. Provide ESS sensors that collect, store, and transmit the following atmospheric, pavement condition, and subsurface data:
   a. Atmospheric sensors installed along the roadway or on bridges (mounted on existing or new structure or pole and/or installed on the surface):
      i. Air temperature data
      ii. Relative humidity data
      iii. Ultrasonic Wind data
      iv. Barometric pressure data
      v. Precipitation data
      vi. Visibility data
   b. Pavement sensors (located in, above, or under the pavement):
      i. Pavement condition data
      ii. Surface condition data
   c. Subsurface (subsoil) sensor (located in the first travel lane or paved shoulder as approved by the Department).

2. Provide ESS sensors that send their respective data as specified herein to the RPU.

3. Provide ESS sensors and other field equipment that are made of UV, heat, and corrosion-resistant materials.

4. Provide shielded, outdoor-rated cabling with UV stable jacket from the RPU to each sensor in compliance with the ESS manufacturer requirements.

5. It is acceptable to provide sensors that can support multiple measurements of different types.

6. Provide ultrasonic anemometers and other ESS sensors having no moving parts, unless otherwise specified in the Contract documents.

7. Provide ancillary equipment, including aspirated radiation shields, needed for sensors to meet performance requirements defined in this section.

8. Provide weathertight molded cables capable of operating at extended cabling lengths up to 1,000 ft from the sensor to the RPU.

9. Provide atmospheric sensors that meet the minimum performance requirements identified below and in Table 1.
   a. Air Temperature and Humidity Sensor
      i. Provide a sensor that measures air temperature using a resistive sensor.
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ii. Provide a sensor that measures relative humidity using a capacitive sensor.

b. Ultrasonic Wind Sensor
   i. Provide a sensor that continuously measures wind speed and wind direction.
   ii. Provide a sensor that sends wind data to the RPU, including average wind speed, average wind direction, and peak gust and gust wind direction, determined over a 10 to 60-minute time interval as defined by the user, unless otherwise specified in the Contract documents.

c. Barometric Pressure Sensor
   i. Provide a sensor that obtains absolute atmospheric pressure.
   ii. Provide a sensor that can be calibrated for different altitudes.

d. Precipitation Sensor
   i. Provide a sensor that measures the accumulation and rate or intensity of precipitation.
   ii. Provide a sensor that detects visible precipitation in liquid and frozen form.
   iii. Provide a sensor that provides a yes/no indicator until a classification has been determined.
   iv. Provide a sensor that adds a classification for the following types of precipitation:
       a) Rain (light, moderate, and heavy)
       b) Freezing rain (light, moderate, and heavy)
       c) Snow (light, moderate, and heavy)
       d) Precipitation, not categorized (light, moderate, and heavy)

e. Visibility Sensor
   i. Provide a sensor that detects fog, smoke, or a combination thereof.
   ii. Provide a sensor with transmitter hood and the capability to minimize dew build-up on the window of the sensor.
   iii. Provide a sensor that minimizes the amount and effects of dirt contamination and ice formation on the sensor window.
   iv. Provide a sensor that uses the forward scatter principle for the determination of optical visibility in the range designated in Table 1.
## Table 1 – Atmospheric Sensor Performance Requirements

<table>
<thead>
<tr>
<th>Sensor</th>
<th>Measurement</th>
<th>Requirement</th>
<th>Operating Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air Temperature and Humidity</td>
<td>Air Temperature</td>
<td>±0.5°F (±0.3°C)</td>
<td>-40°F to 140°F (-40°C to 60°C)</td>
</tr>
<tr>
<td></td>
<td>Relative Humidity (RH)</td>
<td>±3% (0% to 90% RH) ±5% (90% to 100% RH)</td>
<td>0 to 100%</td>
</tr>
<tr>
<td>Ultrasonic Wind</td>
<td>Wind Speed</td>
<td>±3% from 0 to 77 mph (0 to 124 kph)</td>
<td>0 to 120 mph (0 to 193 kph)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>±5% from 78 to 120 mph (125 to 193 kph)</td>
<td>Resolution: 0.03 mph</td>
</tr>
<tr>
<td></td>
<td>Wind Direction</td>
<td>±3 degrees at speed &gt;0.45 mph (&gt;0.72 kph)</td>
<td>0 to 360 degrees</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Resolution: 0.1 degrees</td>
</tr>
<tr>
<td>Barometric Pressure</td>
<td>Barometric Pressure</td>
<td>±1.0 millibar (-0.03 inch of mercury [inHg])</td>
<td>800 to 1,080 millibars (23.6 to 31.9 inHg)</td>
</tr>
<tr>
<td>Precipitation</td>
<td>Precipitation Type</td>
<td>Yes/No (90% reproducibility), light rain, rain, and ice</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>Precipitation Rate</td>
<td>±0.02 in/hour (±0.5 mm/hour)</td>
<td>0 to 8 in/hour (0 to 20 cm/hour)</td>
</tr>
<tr>
<td></td>
<td>Precipitation Accumulation</td>
<td>±0.02 in (±0.5 mm)</td>
<td>0 to 8 in (0 to 20 cm)</td>
</tr>
<tr>
<td>Visibility</td>
<td>Visibility</td>
<td>±10% at 100 ft (30 m) to 1 mile (1.6 km) range ±15% at 1 mile (1.6 km) to 10 miles (16 km)</td>
<td>100 ft to 52,800 ft (30 m to 16,000 m)</td>
</tr>
</tbody>
</table>

10. Provide a non-invasive (no physical impact to the pavement) pavement or surface sensor that meets the minimum performance requirements identified below and in Table 2.

   a. Provide a sensor that measures the temperature using IR technology.
   
   b. Provide a sensor that takes a surface or pavement temperature reading at no more than three minute intervals.
   
   c. Provide a sensor that determines pavement or surface status as follows:
      
      i. Dry – Absence of moisture on the surface sensor.
      
      ii. Damp – Trace pavement moisture above freezing (no precipitation).
      
      iii. Wet – Precipitation has occurred and there is a continuous layer of water or moisture on the pavement.
      
      iv. Ice – Detection of ice layer formation on the pavement.
      

11. Provide an in-pavement sensor that meets the minimum performance requirements identified below and in Table 2.

   a. Provide a sensor that measures surface temperature.
   
   b. Provide a sensor that measures pavement friction or a grip level (critical to dry).
Table 2 – Pavement Condition Sensor Performance Requirements

<table>
<thead>
<tr>
<th>Sensor</th>
<th>Sensor Measurement</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Accuracy Range</td>
</tr>
<tr>
<td>Surface Temperature</td>
<td>Surface Temperature</td>
<td>±0.5°F (±0.3°C)</td>
</tr>
<tr>
<td></td>
<td>Dry</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Damp</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Wet</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ice</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Snow</td>
<td></td>
</tr>
<tr>
<td>Surface Status</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Dry</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>Damp</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Wet</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ice</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Snow</td>
<td></td>
</tr>
<tr>
<td>Surface Condition</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ice Layer</td>
<td>±0.004 in (±0.1 mm)</td>
</tr>
<tr>
<td></td>
<td>Water Layer</td>
<td>±0.004 in (±0.1 mm)</td>
</tr>
<tr>
<td></td>
<td>Grip Level</td>
<td>N/A</td>
</tr>
</tbody>
</table>

12. Provide a subsurface sensor that meets the minimum performance requirements identified below and in Table 3.
   a. Provide a sensor that measures subsurface temperature.
   b. Provide a sensor that measures the temperature at depths up to 18 in below the pavement layer, unless otherwise indicated in the Contract documents.

Table 3 – Subsurface Sensor Performance Requirements

<table>
<thead>
<tr>
<th>Sensor</th>
<th>Sensor Measurement</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Accuracy Range</td>
</tr>
<tr>
<td>Subsurface Temperature</td>
<td>Subsurface Temperature</td>
<td>±0.4°F (±0.22°C)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(~-40°C to 60°C)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.06°C)</td>
</tr>
</tbody>
</table>

C. RPU

1. Provide RPU that can collect, store, and process sensor data to describe current weather conditions.
2. Provide RPU that accepts a minimum of 10 sensors concurrently and can be expanded to accept up to five additional sensors.
3. Provide RPU that allows for interoperability and connectivity to multiple vendors’ sensor products.
5. Provide RPU that uses “watch-dog” circuitry and monitors its’ own operation and resets itself if the RPU software enters an indeterminate state by itself or by a user administrator.
6. Provide RPU that can be reset from a centralized control location.
7. Provide RPU circuitry, including voltage inputs, sensor inputs, and communications ports, with transient and surge protection.
8. Provide RPU that uses SNMP traps to alert a system operator of alarm conditions.
   a. Provide RPU that issues an alert if its power supply is low or if there has been a complete power loss.
   b. Provide RPU that sends a message to the system operator when the unit returns to normal operation.
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9. Provide RPU that connects a dry contact solid state relay to open or closed based on any weather condition parameter sensed by the ESS sensor.

10. Provide RPU that uses sensor data to calculate the precipitation (any type) start and end time, time since last precipitation, forecasted snow or rain accumulation (equal to previous time interval), and probability of precipitation.

11. Provide RPU that uses non-invasive sensor data to calculate or determine the depth of precipitation including water and ice, percent of ice, snow/ice warning, snow/ice watch, wet below freezing, and frost condition.

12. Provide RPU that uses in-pavement sensor data to calculate or determine the average surface temperature and average grip level.

13. Provide RPU that uses subsurface sensor data to calculate or determine the average subsurface temperature to display temperature data incrementally by depth of reading.

14. Provide RPU with the capability to record and archive automated ESS sensor observations for a minimum period of three calendar days and provides user-selectable interval of archived observations between 1 and 20 minutes.

15. Provide RPU with software that has a user interface on the RPU (either through web or an external display) for troubleshooting, sensor configuration, and routine maintenance.

16. Provide RPU that supports remote firmware upgrades and sensor calibrations without the need for personnel to be on-site.

D. Mobile ESS (Type 3 Only)

1. Provide mobile ESS sensors that meet the minimum performance requirements identified below and in Table 4.

2. Provide mobile ESS with new, corrosion-resistant sensors.

3. Provide mobile ESS that operates with different surface materials (asphalt, concrete) without special calibration.

4. Provide mobile ESS that maintains continuous performance even with pavement damage and potholes in the road.

5. Provide mobile ESS sensor on the exterior front of the vehicle that measures surface temperature, air temperature, and humidity in real time.

6. Provide mobile ESS sensor on the exterior rear of the vehicle that measures pavement conditions (dry, moist, wet, ice), provides the thickness of any water or ice detected on the pavement, and calculates the friction of the pavement.

7. Provide mobile ESS that operates within a DC power range of 12 to 24 VDC.

8. Provide mobile ESS that integrates with automated vehicle location units.

E. Communications and Network

1. Support direct fiber-based 10/100 Ethernet connections, Ethernet-based broadband cellular, or IEEE 802.11 wireless connectivity for transport of ESS data to the TMC as specified in the Contract documents.

2. For sites utilizing broadband cellular service for providing network connectivity to the TMC, utilize the Department’s current cellular telecommunication service provider. Refer to Section 926.2.01.F for broadband cellular router requirements.

3. Comply with NTCIP 1204 v03 or later.

4. Provide NTCIP conformance documentation with PRL with the materials submittal package.

5. Provide support to the Department in making the weather monitoring and reporting system data from the ESSs available to the National Weather Service for use by the Meteorological Assimilation Data Ingest System or successor program software. The data shall be pushed at regular intervals from a central ESS server to a known site, such as a hosted FTP server. RPU communication with the hosted server shall utilize NTCIP-ESS protocol.
RPU shall allow the server to poll the RPU via Ethernet communications. The data shall be formatted in a common data format (e.g., .csv or .xml) for exporting into other system(s).

F. Mechanical
1. Provide equipment that is permanently marked with manufacturer name or trademark, part number, and serial number.
2. Provide conductive contact surfaces or pins that are made of a noncorrosive, nonrusting, conductive metal.
3. Do not use self-tapping screws on the exterior of the assembly.
4. Provide parts that are made of corrosion and UV-resistant materials, such as plastic, stainless steel, anodized aluminum, brass, or gold-plated metal.
5. Provide assembly and mounting hardware, including nuts, bolts, external screws, and locking washers ≤5/8 in (15.8 mm) in diameter, that are made of Type 304 or 316, stainless steel meeting the requirements of ASTM F593 and ASTM F594.
6. Provide assembly hardware ≥5/8 in (15.8 mm) in diameter that are galvanized meeting the requirements of ASTM F3125.

G. Electrical
1. Provide DC conversion for any equipment requiring DC power.
2. Supply DC-to-DC or AC-to-DC conversion as required and voltage converter for devices that require operating voltages <120 VAC.
3. When required in the Contract documents, connect to a field UPS as specified in Section 939.2.07.
4. ESS Type 1 only: Provide the capability to operate using 120 VAC (±10%) 50/60 Hz (±5%).
5. ESS Type 2 only: Provide the capability to operate using 12 VDC (±10%) power provided from a solar power system meeting the minimum solar power system requirements specified in Section 939.2.08.
6. ESS Type 3 only: Provide the capability to operate using 12 VDC (±10%) as provided from a standard vehicle DC connector outlet.

H. Field Cabinet: Provide system components that are compatible with the field cabinet as shown in the Contract documents. The field cabinet is not included in the pay items defined in Section 694.5.

I. Mounting and Support Structure
1. Mount ESS atmospheric sensors, ESS field cabinet, and other required components on a single existing or new Department support structure or pole unless otherwise specified in the Contract documents.
2. Provide new support brackets, mounting hardware, and ancillary materials to mount ESS sensors and components.
### Table 4 – Mobile ESS Sensor Performance Requirements

<table>
<thead>
<tr>
<th>Sensor</th>
<th>Sensor Measurement</th>
<th>Requirement</th>
<th>Frequency of Reading</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air Temperature and Relative Humidity</td>
<td>Air Temperature</td>
<td>±0.5°F (±0.3°C)</td>
<td>-22°F to 122°F (-30°C to 50°C)</td>
</tr>
<tr>
<td></td>
<td>Relative Humidity (RH)</td>
<td>±3% (0% to 90% RH) ±5% (90% to 100% RH)</td>
<td>0 to 100%</td>
</tr>
<tr>
<td>Surface Temperature</td>
<td>Surface Temperature</td>
<td>±1.1°F (±0.6°C)</td>
<td></td>
</tr>
<tr>
<td>Surface Status</td>
<td>Dry</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>Wet</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Damp or Moist</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Frost</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Snow and Ice</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Surface Condition</td>
<td>Ice Layer</td>
<td>±0.1 mm (up to 1.0 mm) ±0.004 in</td>
<td>0 to 0.06 in (0 to 2 mm)</td>
</tr>
<tr>
<td></td>
<td>Water Layer</td>
<td>±0.1 mm (up to 1.0 mm) ±0.004 in</td>
<td>0 to 0.06 in (0 to 2 mm)</td>
</tr>
<tr>
<td></td>
<td>Grip Level</td>
<td>N/A</td>
<td>0.01 to 1</td>
</tr>
</tbody>
</table>

### J. Environmental

1. Provide ESS equipment and components capable of operating in the following minimum temperature range and humidity levels:
   a. -40°F (-40°C) through 140°F (60°C) for outside the vehicle and -13°F (-25°C) through 122°F (50°C) for inside the vehicle
   b. Up to 95% relative humidity (non-condensing)
2. Comply with NEMA 250, Type 4X corrosion requirements when installed within 5 miles (8 km) of the coastline.
3. Comply with IEC EN 60068-2, NEMA TS-2 Sections 2.1.9 and 2.1.10, or approved equivalent vibration and shock testing requirements.
4. Comply with IEC EN 61000-4-5 surge immunity testing requirements.
5. Provide ESS system that can withstand wind speeds of 100 mph (161 kph) with a 20% gust factor.
6. Comply with the following EMC emission standards:
   a. FCC Part 15, Subpart B, Class B
   b. IEC EN 61326-1

### 694.3 Construction

The construction and installation of the ESS equipment, materials, components, and assemblies as specified herein shall meet the requirements in this section and the ESS manufacturers’ installation requirements and recommendations.

### 694.3.01 Construction Requirements

#### A. General Construction

1. The Department may require the Contractor to demonstrate the proposed ESS prior to deployment in regards to providing interoperability and connectivity with the existing statewide ESS system.
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2. Install ESS sensors, RPU's, associated ESS field cabinets, and equipment at the locations specified in the Contract documents and per ESS manufacturer recommendations.

3. Coordinate with and support the Department in the installation of mobile ESS onto selected state vehicles as required by the Contract documents.

4. Mount ESS components and sensors on new or existing structures or poles or install on the surface unless otherwise stated in the Contract documents.

5. Unless detailed otherwise in the Contract documents, mount atmospheric sensors except anemometers at ESS cabinet-top height, approximately 10 ft (3 m) above pavement surface grade.

6. Mount anemometers at the top of the tower or pole. If local restrictions prevent installing the anemometers at the top, install the anemometers at a minimum height of 16 ft (4.9 m) above pavement surface grade.

7. Mount sensors and devices on a mounting bracket such that the height and position provide a clear view of the lanes.

8. Mount the device such that it is rigid and not subject to vibration. The mounting bracket assembly shall include a sensor mounting bracket, pipe, and all associated hardware and materials.

9. Install ESS power supply or transformer on a standard DIN rail using standard mounting hardware and power conductors wired to terminal blocks in the ESS field cabinet.

10. Install primary power that is fused for 15A with surge protection that is compliant with UL 497B to protect the power and control and return conductors along with site equipment, and in compliance with the ESS manufacturer’s recommendations.

11. Install surge protection and cabling that comply with manufacturer’s recommendations at a minimum, or as specified in the Contract documents.

12. Install cabling and wiring internal to a pole, in conduit attached to truss members, or in underground conduit.

13. Provide cable connections that are manufacturer-rated and protected from outside elements.

14. Coordinate with the Department to establish electrical utility service as specified in Section 682.3.05.M.
   a. Verify with the local power service provider to ensure that the provided equipment is compatible with the installed equipment.
   b. Contractor shall be responsible for paying for electrical service as required from the time of testing up to the issuance of the MAL by the Department at which time the service provider account shall be transferred to the Department.

15. Comply with NEC requirements and Section 682.3.05.N for grounding and bonding requirements.

16. Provide exposed cabling and connections that are outdoor-rated or wrapped with self-sealing tape for watertight and moisture seal.

17. For in-pavement and subsurface sensors:
   a. Locate sensors as specified in the Contract documents.
   b. Install buried lead-in cable in conduit at subsurface elevation in unpaved locations (i.e., from pole or tower to roadway edge of pavement).
   c. Install lead-in cable in the pavement in compliance with the manufacturer’s recommendations.
   d. Install surface sensors flush with the roadway surface or as directed by the Department.
   e. Provide wiring and cables that are continuous (without splices); except for surge protection connections between sensor and ESS field cabinet, so that ESSs are protected from lightning-induced surges.

18. Install cables for all sensors through the bottom of the ESS field cabinet that houses the RPU.
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19. Tape ends of unused and spare conductors to prevent accidental contact to other circuits. Label all conductors inside the ESS field cabinet.

20. Establish power service as required and pay for electrical service from deployment set-up to the issuance of the MAL at which time the Contractor shall arrange and schedule for the transfer of service to the Department.

B. ESS Commissioning

1. Upon completion of the ESS equipment installation, the following shall be performed by personnel certified by the ESS manufacturer, if applicable:
   a. Make final sensor connections to the RPU.
   b. Perform final system checks, sensor alignments, software setup, and software configuration to provide a fully operational ESS.
   c. Provide test support for the entire system.

2. Commissioning shall include the following items:
   a. Verification that the installed ESS equipment is powered up, online, and communicating with the host server.
   b. Verification that the ESS is fully calibrated, properly installed, safely mounted, and ready for use.

694.3.02 Equipment Configuration and Integration Requirements

Refer to Section 942.3.03 for ESS RPU and component configuration and integration requirements.

694.3.03 Testing Requirements

Refer to Section 942.3.04 for testing requirements.

694.3.04 Training Requirements

Refer to Section 942.3.05 for training requirements.

694.3.05 Warranty and Maintenance Support Services

A. Warranty Requirements

1. Provide a minimum warranty length of five years for ESS and associated components. If the manufacturer’s warranties for the components are for a longer period, those longer period warranties shall apply.

2. Refer to Section 942.3.02 for general warranty requirements.

B. Maintenance Support Services

Refer to Section 942.3.02 for maintenance support services requirements.

694.4 Measurement

The ESS and training that are complete, in place, accepted, and of the kind, size, and type specified will be measured as follows:

A. ESS, Type 1

The Type 1 ESS will be measured for payment by the number installed, completed, functional, and accepted. Unless otherwise specified in the Contract documents, furnish, install, test, and provide warranty for the following minimum items as part of an ESS stationary system: atmospheric sensors, pavement condition sensors, and ancillary equipment or incidental items, including wiring and cabling, mounting hardware, power supplies, grounding, surge protection devices, and power connections, and power service to make a complete and fully operational ESS.
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B. ESS, Type 2
Same as ESS Type 1 except using solar power components.

C. ESS, Type 3
The Type 3 ESS will be measured for payment by the number installed within vehicles, completed, functional, and accepted. Unless otherwise specified in the Contract documents, furnish, install, test, and provide warranty for the following minimum items as part of an ESS mobile system: atmospheric sensors, surface condition sensors, interface unit and processor, and ancillary equipment or incidental items, including wiring and cabling, mounting hardware, and power supplies, to make a complete and fully operational mobile ESS.

D. ESS Sensors
The ESS sensors including 1) pavement sensor, non-invasive; 2) atmospheric sensor, visibility; 3) atmospheric sensor, air temperature and relative humidity; 4) atmospheric sensor, ultrasonic wind; 5) atmospheric sensor, barometric pressure; 6) atmospheric sensor, precipitation; and 7) subsoil sensor will be measured for payment by the number installed, completed, functional, tested, and accepted. Unless otherwise specified in the Contract documents, furnish, install, and provide warranty for ESS sensors and ancillary equipment or incidental items, including wiring and cabling, and mounting hardware, to make a complete and fully operational mobile ESS.

E. RPU
The RPU will be measured for payment by the number installed, completed, functional, tested, and accepted. Unless otherwise specified in the Contract documents, furnish, install, and provide warranty for RPU and ancillary equipment or incidental items, including wiring and cabling, and rack mounting hardware, to make a complete and fully operational RPU.

F. Training
Training will be measured as a lump sum for supplies, equipment, materials, handouts, travel, and subsistence necessary to conduct the training.

694.5 Payment

694.5.01 Weather Monitoring and Reporting System
ESSs of the types specified in the Contract documents will be paid for at the Contract unit price. This price will include full compensation for labor, materials, equipment, tools, test equipment, incidentals, installation, testing, and providing warranty, necessary to complete the weather monitoring and reporting system.

A percentage of the total Contract lump sum price will be paid for weather monitoring and reporting system according to the following cost schedule. The total sum of all payments cannot exceed the original Contract amount for this item.

<table>
<thead>
<tr>
<th>Event Description</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upon delivery and properly stored materials</td>
<td>25%</td>
</tr>
<tr>
<td>Upon successful completion of the Stand-Alone Test</td>
<td>50%</td>
</tr>
<tr>
<td>Upon issuance of the partial MAL by the Department</td>
<td>25%</td>
</tr>
</tbody>
</table>

Payment Notes:
Submittal
Submittal requirements are included in Section 942.1.04 and will not be paid for separately. It will be considered incidental to the ESS pay item.

Testing
Testing is defined in Section 942.3.04 and will not be paid for separately. It will be considered incidental to the ESS pay item.

ESS Field Cabinets
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New ESS field cabinets will be paid for separately under Section 939.5 pay items.
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**ESS Support Structure**

ESS support structure including poles and towers will be paid for separately under Section 639.5 pay items.

**GDOT Central Software Integration**

GDOT Central Software integration is included in Section 942.3.03 and will be paid for under the Section 942.5 pay item.

**Broadband Wireless Routers**

Broadband wireless routers will be paid for separately under the Section 926 pay item.

Payment for the weather monitoring and reporting system will be made under:

<table>
<thead>
<tr>
<th>Item No. 694</th>
<th>ESS, Type</th>
<th>Per each</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item No. 694</td>
<td>Pavement Sensor, Non-invasive</td>
<td>Per each</td>
</tr>
<tr>
<td>Item No. 694</td>
<td>Atmospheric Sensor, Visibility</td>
<td>Per each</td>
</tr>
<tr>
<td>Item No. 694</td>
<td>Atmospheric Sensor, Air Temperature and Relative Humidity</td>
<td>Per each</td>
</tr>
<tr>
<td>Item No. 694</td>
<td>Atmospheric Sensor, Ultrasonic Wind</td>
<td>Per each</td>
</tr>
<tr>
<td>Item No. 694</td>
<td>Atmospheric Sensor, Barometric Pressure</td>
<td>Per each</td>
</tr>
<tr>
<td>Item No. 694</td>
<td>Atmospheric Sensor, Precipitation</td>
<td>Per each</td>
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<tr>
<td>Item No. 694</td>
<td>Subsoil Sensor</td>
<td>Per each</td>
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<tr>
<td>Item No. 694</td>
<td>Remote Processing Unit</td>
<td>Per each</td>
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**694.5.02 Training**

Payment for training will be made under:

<table>
<thead>
<tr>
<th>Item No. 694</th>
<th>Training</th>
<th>Lump Sum</th>
</tr>
</thead>
</table>
DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

SUPPLEMENTAL SPECIFICATION

Section 926—Wireless Communications System

Delete Section 926 in its entirety and substitute the following:

926.1 General Description

Furnish, install, optimize, test, and provide warranty and training for a wireless system comprised of a radio transceiver, wireless router, antennas, and other components and materials as specified herein and shown in the Contract documents.

926.1.1 Definitions, Acronyms, and Abbreviations

A. Definitions

1. **Type 1, 900 MHz Wireless Ethernet System**: Provide up to 10 Mbps throughput capacity at a minimum range of 10 mi (16 km).

2. **Type 2, 2.4 or 5 GHz Wireless Ethernet System**: Provide up to 100 Mbps throughput capacity at a minimum range of 15 mi (24 km).

3. **Type 3, 2.4 or 5 GHz Wireless Backhaul Ethernet System**: Provide up to 600 Mbps throughput capacity at a minimum range of 25 mi (40 km).

4. **Type 4, 4G Cellular Wireless System**: Provide up to 4G throughput capacity using the Department’s current wireless service provider’s 4G network.

B. Acronyms and Abbreviations

Refer to Sections 101.01 and 940.1.01(A) for a list of acronyms, abbreviations, and terminology used in this section and throughout these ITS specifications.

926.1.2 Related References

A. GDOT Standard Specifications

1. Section 150–Traffic Control

2. Section 639–Strain Poles for Overhead Sign and Signal Assemblies

3. Section 647–Traffic Signal Installation

4. Section 694–Weather Monitoring and Reporting System

5. Section 682–Electrical Wire, Cable, and Conduit

6. Section 939–Communication and Electronic Equipment

7. Section 940–ITS General Requirements

B. Referenced Standards and Documents

1. Refer to Section 940.1.01(B) for a list of standards and documents referenced in this section and throughout these ITS specifications.
Section 926—Wireless Communications System

2. Ensure that all wireless system equipment, components, and materials are consistent and compliant with the latest version or edition of the standards and industry practices as specified.

926.1.3 Submittals
Refer to Section 940.2.01 for submittal requirements. Requirements for wireless system equipment, materials, and components are specified herein.

926.2 Materials

926.2.1 General Requirements
1. Manufacture in an International Organization for Standardization (ISO) 9001-certified manufacturing facility that is regularly engaged in the production of the materials described in this section
2. Provide only proven and commercial-off-the-shelf equipment and materials.
3. Provide equipment and materials that are of new manufacture and previously unused.
4. Provide equipment and materials that are of like kind and function from the same manufacturer, using the same model, part number, revision, and firmware.
5. Ensure that component parts are readily accessible for inspection and maintenance using standard hand tools (no non-standard tools).
6. Use the most stringent material requirement for this Contract if a conflict or difference exists between the specified industry standards and practices listed in Section 926.1.02(B) and these minimum standard specifications. Notify and resolve with the Department or authority having jurisdiction of any such conflicts or differences prior to procurement of materials and components.

926.2.2 Types 1 to 3 Wireless System Requirements
A. Wireless System Requirements
   1. System Type and Network Topology:
      a. Provide a wireless system that supports point-to-point (PtP) or point-to-multi-point (PtMP) network topology as shown in the Contract documents.
      b. Provide a wireless system that operates in an unlicensed (license-exempt) Federal Communications Commission (FCC) frequency band.
      c. Type 1 only: Provide a single radio that is integrated with an antenna unit or as an alternative a single radio with an external antenna.
      d. Types 2 and 3 only: Provide a single radio that is integrated with an antenna unit.
   2. Frequency: Provide a system that operates in a FCC unlicensed Industrial, Scientific, and Medical (ISM) band of 900 MHz, 2.4 GHz, or 5 GHz as specified in the Contract documents or as determined during the wireless survey as specified in Section 926.3.02 (B).
   3. FCC Certification: Comply with the following:
      b. FCC Part 15.247 (ISM)
      c. IEC EN 61326-1
   4. Transmit Power: Provide user programmable or selectable output levels, up to the maximum output power and effective isotropic radiated power (EIRP) allowed by FCC Part 15 for unlicensed frequencies.
   5. Link Range: Provide a wireless radio link that provides range coverage as specified in the Contract documents.
Section 926—Wireless Communications System

6. **System Throughput:**
   a. Type 1 only: Provide a minimum aggregate system throughput of up to 10 Mbps.
   b. Type 2 only: Provide a minimum aggregate system throughput of up to 100 Mbps.
   c. Type 3 only: Provide a minimum aggregate system throughput of up to 600 Mbps.

7. **Channel Size:**
   a. Type 1 only: Provide minimum channel bandwidths of 5 MHz, 10 MHz, and 20 MHz.
   b. Type 2 only: Provide minimum channel bandwidths of 20 MHz and 40 MHz.
   c. Type 3 only: Provide minimum channel bandwidths of 40 MHz and 80 MHz.

8. **Channel Frequency and Selection:** Provide dynamic frequency and channel selection capability based on interference detection, with a manual override option.

9. **Modulation:** Provide adaptive modulation and space diversity to provide maximum throughput.

10. **Modulation Type:**
    a. **Type 1 only:** Provide frequency hopping direct sequence spread spectrum (DSSS) or orthogonal frequency division multiplexing (OFDM) modulation technology.
    b. **Types 2 and 3 only:** Provide multiple-in-multiple-out (MIMO) OFDM modulation with binary phase-shift keying (BPSK), quadrature phase shift keying (QPSK), QAM16, QAM64, QAM256.
    c. **Types 2 and 3 only:** Provide Modulation and Coding Scheme (MCS) 0 to 9 with dynamic data rate selection.

11. **Mean-Time-Between-Failure (MTBF):** Provide a minimum MTBF of 200,000 hours using Telcordia SR-332, Method 1, Case 3 or MIL-HDBK-217J standards.

B. **Antenna Requirements**

1. **Antenna Type:**
   a. **Type 1 only:** Provide a flat panel type, dual polarized (H+V), narrow beam-width antenna or alternative Yagi.
   b. **Types 2 and 3 only:** Provide a 2x2: 2 MIMO flat panel type, dual polarized (H+V), narrow beam-width antenna or alternative parabolic.
   c. Provide antenna types as recommended by manufacturer for PtP and PtMP topologies as required.

2. **Antenna Gain:** Provide an antenna with antenna gain of 23 dBi or the maximum as allowed by FCC Part 15. Final antenna gain shall be selected per manufacturer’s recommendation based on distance and signal strength.

3. **Antenna Connector:** Provide outdoor-rated and environmentally hardened Type-N connectors or as recommended by the manufacturer.

4. **On-Board Alignment Tools:** Provide wireless system with alignment tools for aligning the antenna system. These tools shall consist of external LED indicators and audible indicators, or as recommended by the manufacturer.

C. **Network Requirements**

1. **Network Standards and Protocols:** Provide a wireless system that meets the following minimum network standards and protocols:
   a. Comply with IEEE 802.3 standards for 10/100/1000 Mbps Ethernet.
   b. Comply with IEEE 802.1d (Ethernet Bridging) standard.
   c. Comply with IEEE 802.1p (Traffic Prioritization/Quality of Service) standard.
   d. Comply with IEEE 802.1q (Virtual LAN [VLAN]) standard.
Section 926—Wireless Communications System

e. Comply with IEEE 802.1d (Spanning Tree Protocol) and IEEE 802.1w (Rapid Spanning Tree Protocol) standards.

f. Comply with IEEE 802.3x (Full Duplex and Flow Control) standard.

g. Comply with IEEE 802.3ad (Link Aggregation) standard.

2. **Data Port**: Equip with a minimum of one 10/100/1000 Base-T/TX, shielded Ethernet-port, using an IP66 rated RJ45 weathertight connector or other Ethernet-compatible locking shielded and weathertight connector.

3. **Network Features**: Types 2 and 3 only: Provide wireless system that supports the following minimum features and capabilities:
   
   a. **Forward Error Correction**: Provide forward error correction capabilities with automatic retransmission.
   
   b. **Dynamic Bandwidth Allocation**: Provide dynamic allocation of uplink and downlink bandwidth.
   
   c. **Jitter Correction**: Provide capability for jitter correction to avoid delay fluctuation in video streams.
   
   d. **Data Burst Transmission**: Provide data burst transmission capability to ensure that fragmented packets are transmitted together.
   
   e. **Polling**: Provide the capability to use a polling protocol to reduce packet loss due to RF collisions.
   
   f. **Traffic Control**: Provide support for Layer 2 features including quality of service (QoS) and Internet Group Management Protocol (IGMP) snooping to reduce un-needed multicast traffic.

D. **Security Requirements**:
   
   
   2. Comply with ISO/IEC 18033-3 standards.
   
   3. Types 2 and 3 only: Support Secure Sockets Layer (SSL).
   
   4. Types 2 and 3 only: Support RADIUS networking protocol for authentication, authorization, and accounting.

E. **Radio Configuration and Management Software Requirements**:
   
   1. Types 2 and 3 only: Provide local and remote management capabilities through Hypertext Transfer Protocol (HTTP), HTTP Secure (HTTPS), Telnet, Secure Shell (SSH), and/or Simple Network Management Protocol (SNMP).
   
   2. Provide programming and software to make operational and support the wireless system with the following minimum features: radio and network configuration, diagnostic routines (i.e., bandwidth test, spectrum scan, and ping test), and alarm management.
   
   3. Provide status LED indicators including data port link activity, data port speed, and link status.
   
   4. Provide the following alarm features:
      
      a. Provide 24-hour monitoring capability for user-selected alarms.
      
      b. Provide optional alarm notifications via email and/or text messages.

F. **Electrical Requirements**
   
   1. Provide wireless radios with PoE injectors meeting specified requirements when the input power is 115 VAC ±20%, 60 Hz ±3 Hz, and that maximum power required does not exceed 30W, including optional equipment.
   
   2. Provide PoE power to the wireless radio meeting the following minimum requirements:
      
      a. Provide a standalone PoE injector. Providing PoE service using a PoE-capable Ethernet switch is not permitted.
Section 926—Wireless Communications System

b. Select PoE injectors based on the power requirements of the wireless systems as recommended by the manufacturer conforming to the following PoE standards:
   i. PoE in compliance with IEEE 802.3af standard.
   ii. PoE+ in compliance with IEEE 802.3at standard.

c. Mount PoE injectors to wall/panel or DIN-rail within the field cabinet.


4. Meet the requirements of Section 2.1.6, "Transients, Power Service," of NEMA Standard TS 2.

G. Mechanical and Mounting Requirements:

1. For non-integrated types provide a wireless radio that is capable of being rack- or shelf-mounted in a secure manner.

2. Provide equipment that is modular in design such that it can be easily replaced in the field.

3. Ensure unit dimensions and weight are as follows:
   a. Maximum dimensions shall be 16 in by 16 in by 12 in for integrated units, not including the antenna.
   b. Maximum weight shall not exceed 35 lb.

4. Coat printed circuit boards with a clear-coat moisture and fungus-resistant material (conformal coating).

5. Provide pole mounting attachment hardware as required and needed for mounting to existing poles or structures, as determined by the wireless radio survey and/or the device manufacturer.

6. Use external screws, nuts, and locking washers that are stainless steel; no self-tapping screws shall be used unless specifically approved by the Department.

7. Use parts made of corrosion-resistant material, such as plastic, stainless steel, anodized aluminum, or brass.

8. Use materials in construction that are protected from fungus growth and moisture deterioration.

9. Ensure that any dissimilar metals are separated by an inert dielectric material.

926.2.3 Type 4 Wireless System Requirements

Provide an integrated 4G/LTE cellular wireless router only as listed on the GDOT Qualified Products List (QPL) and as approved by the Department’s current cellular telecommunications service provider. No other devices are permitted.

A. General Requirements:

1. Provide integrated cellular wireless router that is an approved product by the Department’s existing cellular telecommunications service provider.

2. Provide a 4G cellular wireless router that meets the following minimum network standards and protocols:
   a. Comply with IEEE 802.3 standards for 10/100/1000 Mbps Ethernet.
   b. Provide full support for Secure Sockets Layer (SSL).
   c. Provide full support for Internet Protocol Security (IPSec) and Virtual Private Network (VPN) functionality.
   d. Provide at a minimum AEC 128-bit (AES-128) encryption capability.
   e. Support MAC address filtering and Access Control List.

3. Provide capability for network traffic to be accessible via a public or private IP connection, via VPN tunnel with SSL, IPSec, and IP pass-through.
Section 926—Wireless Communications System

4. Equip with a minimum of one 10/100/1000 Base-T/TX, shielded Ethernet-port, outdoor-rated RJ-45 connector or other Ethernet-compatible weathertight connector.

5. Provide visual status indicators including Power, Signal, Ethernet Link, and Activity.

6. Provide wireless router that can operate using 100 to 240 VAC, 50 to 60 Hz or 12/24/48 VDC power, as specified by the Contract documents or directed by the Department.

B. Antenna Requirements

1. Provide an external ruggedized antenna for wireless 4G operations meeting the following minimum requirements:
   a. Provide a minimum gain of 4 dBi, vertical polarized.
   b. Provide omnidirectional pattern.
   c. Support up to 100W power.
   d. Provide a VSWR of 2.0:1 or less.
   e. Provide multiband support including the 698 to 960 MHz and 1700 to 2700 MHz bands.
   f. Provide mounting hardware as recommended by the manufacturer.

2. Provide RF coaxial cable as specified in Section 926.2.04(C) between the wireless modem/router and the antenna.

926.2.4 Cable and Surge Requirements

A. Antenna Coaxial Cables

Provide antenna coaxial cables as specified herein for external antenna (non-integrated radio and antenna) sites or outdoor-rated Cat-6 cables for integrated radio/antennasites.

B. Outdoor-Rated Cat-6 Cable:

Provide outdoor-rated, shielded Cat-6 cabling from the PoE injector to the wireless radio meeting the following minimum requirements:

2. Comply with ICEA 5-56-434 standard for communications cables for outdoor use including watertight, outdoor CMX UV-rated jacket.
3. Provide with insulated 22 to 23 AWG, solid bare copper conductors with polyolefin insulation, arranged in four color-coded shielded twisted-pairs with drain wire incorporating a cross-web separator design.
4. Provide modular IP66-rated shielded RJ-45 8P8C male push-pull connectors with eight-position non-keyed and eight gold anodized pins.

C. RF Coaxial Cable:

Provide a RF coaxial cable meeting the following minimum requirements (Note: The Department currently uses LMR series coaxial at wireless sites).

1. Provide a cable that is flexible, low-loss, outdoor-rated and watertight.
2. Provide a cable with a black UV-resistant polyethylene jacket.
3. Provide a cable with a dual shield consisting of 100% foil and 88% braided.
4. Provide shielding effectiveness of >90 dB.
5. Provide solid bare, copper center conductor.
6. Provide a characteristic impedance of 50 ohms, nominal.
Section 926—Wireless Communications System

7. Provide a cable with maximum frequency of 6 GHz.

8. Provide an attenuation of 3.9 dB/100 ft (at 900 MHz) or better. If cable length is shorter than 20 ft, the cable can be smaller in diameter with a maximum attenuation of 9.9 dB/100 ft.

9. Provide a capacitance (conductor to shield) of 23.9 pF/ft or better, nominal.

10. Provide an inductance of 0.060 uH/ft or better, nominal.

11. Provide Type N connectors or as recommended by the manufacturer that are weathertight and factory installed on both ends with a maximum insertion loss of 0.2 dB.

D. Surge Protection

Meet the following minimum surge protection device (SPD) requirements:

1. Category-6 Ethernet PoE Surge Protection:
   a. Provide SPD that is UL 497B listed.
   b. Comply with TIA-568-A/B.
   c. Comply with IEEE 802.3af and IEEE 802.3at as required.
   d. Support data rates of up to 1 Gbps.
   e. Provide a peak surge current rating (Imax) of a minimum of 2 kA (8/20 µs waveform).
   f. Provide a clamping voltage of up to 90 VDC.
   g. Provide protection for all eight pins.
   h. Provide differential and common mode protection.
   i. Provide input and output connections with shielded RJ-45 connectors.
   j. Provide system capable of being wall/panel or DIN-rail mounted.
   k. Provide a SPD that is constructed of aluminum metal housing.

2. RF Coaxial Surge Protection:
   a. Provide SPD that is UL 497E listed.
   b. Provide a Rated Nominal Surge Current (In) per UL 497E of 10 kA (8/20 µs waveform).
   c. Provide a Rated Power/Current (RF, DC) per UL 497E: VHF 375W, UHF (low) 250W, 800 MHz to 1 GHz 125W.
   d. Provide a protection level of <1000V for up to 375W SPD.
   e. Provide an insertion loss of ≤0.2 dB over wireless system frequency range.
   f. Provide SPD that supports a VSWR of 1.3:1.
   g. Provide SPD with field replaceable gas discharge tube for maintenance.
   h. Provide SPD with minimum environmental protection rating of IP65.
   i. Provide SPD with mating connectors per antenna type.

3. Bonding: Provide hardware and materials to bond SPDs to the field cabinet ground buss bar.

926.2.5 Wireless System Environmental Requirements

1. Provide wireless equipment and components as specified herein that meets the following minimum operating ambient temperature range and humidity levels:
Section 926—Wireless Communications System

a.  -4°F (−20°C) through 165°F (74°C)
   b.  Up to 95% relative humidity (non-condensing)

2.  Comply with NEMA 250, Type 4X corrosion requirements.

3.  Comply with IEC 61000-4-5 surge immunity testing requirements.

4.  Comply with NEMA TS 2 Sections 2.2.8 (vibration) and 2.2.9 (shock) test requirements.

5.  Ensure that the wireless system can withstand wind speeds of 100 mph (161 kph) with a 20% gust factor.

926.3 Construction

Ensure that construction and installation of the equipment, materials, components, and assemblies of the wireless system specified comply with the wireless manufacturer’s requirements and recommendations.

926.3.1 Contractor Experience and Qualifications

1.  Provide evidence of five similar projects completed by the Contractor and/or sub-contractor that consisted of wireless communications installation, testing, and system optimization. Each project must include transmitting signals over a minimum of five miles distance and installation of a minimum of three devices.

2.  Provide evidence that the technical staff who will perform the wireless system work on the Project have a minimum of three years of similar experience and are certified by the manufacturer for installation and maintenance of their equipment.

3.  Provide three continuous years of wireless communications services by the Contractor and/or sub-contractor including the following:
   a.  Conducting radio installation studies consisting of:
      i.  Signal noise studies
      ii. Spectrum analysis
      iii. Antenna gain/radio power calculations
      iv.  System attenuation
      v.  Measurement of standing wave ratios
   b.  Installation and optimization of broadband radio systems consisting of:
      i.  Equipment installation
      ii. Configuration of radios
      iii. Antenna calibration
      iv.  Cabling
   c.  Installation and optimization of interconnected Ethernet networks (LAN and WAN) consisting of:
      i.  Cabling
      ii. Switch/router configuration
      iii. Network analysis
Section 926—Wireless Communications System

926.3.2 Construction Requirements

A. General Installation Requirements

1. Provide and install materials, including support, optimization, and test equipment, to ensure an operating and functional wireless radio system. This includes installation of power and data cables, and the power grounding and lightning suppression and surge protection systems.

2. Prior to beginning installation, inspect each site to verify suitability of the design for installation, grounding, and lightning protection.

3. Conduct a wireless system survey as specified in Section 926.3.02(B).

4. Adjust antenna polarities and channel plans on equipment to minimize interference from other sources, as applicable and determined by the wireless system survey.

5. Provide equipment that is modular in design such that it can be easily replaced in the field.

6. Label with UV-resistant methods to identify each unit with name, model number, serial number, and any other pertinent information required to facilitate equipment maintenance.

7. Utilize the latest available industry standard construction techniques with a minimum number of parts, subassemblies, circuits, cards, and modules to maximize standardization and commonality.

8. Design equipment for ease of maintenance and orient component parts to be readily accessible for inspection and maintenance.

9. Connectors and Harnesses:
   a. Ensure that external connections are made by means of weathertight connectors.
   b. Provide connectors that are keyed to preclude improper mating or coupling.
   c. Ensure that wires to and from the connectors are color-coded and/or appropriately marked.
   d. Ensure that pins and mating connectors are corrosion resistant.
   e. Ensure that connectors utilizing solder type connections have each soldered connection covered by a piece of heat shrink tubing securely shrunk to ensure that it protects the connection.

B. Wireless System Survey Requirements (Types 1 to 3 only)

1. Conduct wireless survey if required by the Contract documents and upon approval of wireless system and test equipment submittals.

2. Provide required wireless test equipment to conduct wireless survey. Equipment to be submitted and approved by the Department prior to conducting the survey.

3. Survey wireless locations and provide a site-by-site analysis and overall system survey field report.
   a. Verify that the path is clear and provide calculations to show that there is sufficient fade margin to achieve the path availability as specified herein under the expected weather events.
   b. Include an interference analysis of local RF conditions and a path analysis for each wireless node as shown in the Contract documents.
   c. Provide an interference analysis for each wireless node location to identify potential sources of interference. If the interference analysis shows possibility for interference at the Department sites, conduct in-field monitoring to determine whether actual interference exists.
   d. Include a field evaluation of the feasibility of using existing poles or structures for mounting of the integrated wireless radio/antenna system.
Section 926—Wireless Communications System

e. Determine whether repeaters are required as part of the field survey and report. It is not anticipated that repeaters will be needed.

f. Submit the wireless system report to the Department for review and approval. No equipment related to the wireless network shall be purchased or installed prior to the approval of the Wireless System Survey Report. Refer to Section 940 for details on submittal requirements.

C. Radio Mounting Requirements

1. Provide and install radio mounts, standoffs, brackets, hardware, and grounding assemblies for the mounting surface shown in the Contract documents.

2. Install radios at specified locations as shown in the Contract documents.

D. Antenna Mounting Requirements

1. Provide and install antenna mounts, standoffs, brackets, hardware, transmission line, hanger kits, grounding kits, and lightning suppressors for the mounting surface shown in the Contract documents.

2. Install antennas at specified centerlines and as recommended by the manufacturer.

3. Perform antenna alignment for each path and compare with path calculations.

4. Type 4: Mount the antenna on the field cabinet using threaded stub mount for vandal resistant mounting.

E. System Power and Grounding Requirements

1. Connect the wireless equipment to the 115V circuits provided in the field cabinet at the site.

2. Provide grounding and lightning protection for wireless system cable runs at the top of the support structure and at the field cabinet entry port.

3. If the field cabinet and associated entry port is not collocated on the same support structure, provide grounding and lightning protection at the bottom of the support structure.

E. System Optimization

Optimize equipment alignment and settings at each site to provide a complete and operational system.

F. Cabling Requirements

1. Provide conductors and wiring that meet the requirements of the most current version of the NEC.

2. Provide copper-based Ethernet cables that do not exceed IEEE 802.3 distance limitations.

3. Provide conductors that are cut to proper length before assembly. It is not permissible to “double-back” conductors to take up slack inside the field cabinet.

4. Lace conductors neatly with nylon lacing or plastic straps.

5. Organize conductors neatly inside the cabinet and secure cables with clamps.

6. Provide rubber grommets for drilled entrance holes in field cabinets, poles, and structures.

7. Provide service loops at connection points when connecting to hardware inside the cabinet. No splicing of cables or exposed conductors is allowed.

8. Label with UV-resistant methods to identify conductors.

926.3.3 Equipment Configuration and Integration Requirements

Refer to Section 940.2.03 for wireless switch and component configuration and integration requirements.
Section 926—Wireless Communications System

926.3.4 Testing Requirements
Refer to Section 940.2.04 for testing requirements.

926.3.5 Training Requirements
Refer to Section 940.2.05 for training requirements.

926.3.6 Warranty and Maintenance Support Services

A. Warranty Requirements

1. Ensure that the wireless system including wireless radios, antennas, cabling, and associated components defined herein furnished, assembled, and installed have a manufacturer’s warranty (usual and customary) covering defects in assembly, fabrication, and materials. Include in warranty and support, all contractor or manufacturer activities related to maintenance, removal, and replacement of parts and materials during the period of support.

2. Provide the wireless system and associated components with a minimum warranty length of two years. If the manufacturer’s warranties for the components are for a longer period, those longer period warranties shall apply.

3. Ensure warranty periods begin on the date of maintenance acceptance letter by the Department.

4. Ensure that the manufacturer’s warranties are continuous throughout the period and are fully transferable from the Contractor to the Department and any maintenance consultant/contractor.

5. Provide maintenance support services and make any replacements required during the warranty period without additional charge for labor, equipment, parts, shipping, or other materials required. Support all system components notwithstanding any supplier’s warranties whether written or implied.

B. Maintenance Support Services

Refer to Section 940.2.06 for maintenance support services requirements.

926.4 Measurement

The wireless system and training complete, in place, accepted and of the kind, size, and type specified is measured as follows:

A. Types 1 to 3 Wireless System

Item No. 926-2101 – 900 MHz Wireless Ethernet System, Type 1 (EA)

Item No. 926-2102 – 2.4 or 5 GHz Wireless Ethernet System, Type 2 (EA)

Item No. 926-2103 – 2.4 or 5 GHz Wireless Backhaul Ethernet System, Type 3 (EA)

The wireless IP-based Ethernet system will be measured for payment by the number installed, complete, functional, and accepted. Unless otherwise specified in the Contract, furnish and install the following minimum items as part of a wireless system: radio transceiver, antennas, antenna coaxial cables, Cat-6 outdoor-rated cables, PoE injectors, power supplies, surge protection, attachment hardware, any pole attachment permit fees, and work, equipment, and appurtenances as required to provide a fully functional wireless communications system. The price bid shall also include radio configuration and management software, any licenses, programming, device cabling, and system documentation to be turned over to the Department, including shop drawings, operations and maintenance manuals, wiring diagrams, block diagrams, and other material necessary to document the operation of the applicable wireless radio system. This price shall be full compensation for labor, tools, materials, equipment, and incidentals necessary to complete the work and provide a fully operational wireless communications system.

B. Type 4 Wireless System

Item No. 926-2104 – 4G Cellular Wireless Ethernet System, Type 4 (EA)
Section 926—Wireless Communications System

The 4G cellular wireless system will be measured for payment by the number installed, complete, functional, and accepted. Unless otherwise specified in the Contract, furnish and install the following minimum items as part of a 4G wireless system: 4G cellular wireless router or modem, antennas, cabling and associated components, and work, equipment, and appurtenances as required to provide a fully functional 4G cellular wireless communications system. The price bid shall also include system documentation to be turned over to the Department and other material necessary to document the operation of the applicable 4G cellular wireless radio system. This price shall be full compensation for labor, tools, materials, equipment, and incidentals necessary to complete the work.

C. Wireless Training

Item No. 926-3000 – Wireless Training (Lump Sum)

Training is measured as a lump sum for supplies, equipment, materials, handouts, travel, and subsistence necessary to conduct the wireless training.

D. Wireless Radio Survey

Item No. 926-4000 – Wireless Radio Survey (Lump Sum)

Wireless survey is measured as a lump sum for wireless measurement tools, supplies, equipment, materials, development of report and recommendations, travel, and subsistence necessary to conduct the wireless radio survey.

Measurement Notes:

Submittal

Submittal requirements are included in Section 940 and shall not be paid for separately. It shall be considered incidental to the wireless system pay item.

Testing

Testing requirements are included in Section 940 and shall not be paid for separately. It shall be considered incidental to the wireless system pay item.

Wireless Enclosures and Cabinets

Wireless system enclosures and cabinets for housing the communications equipment, and other components shall be considered incidental to the wireless system pay item.

NaviGAtor Integration

NaviGAtor integration requirements are included in Section 940 and shall be paid for under 940-1000.

926.5 Payment

926.5.1 Wireless System

Wireless systems of the types specified in the Contract documents are paid for at the Contract Unit Price. Payment is full compensation for installing, testing, and providing warranty for the wireless system.

The Department will pay 25% of the total Contract bid amount for properly stored materials. The Department will pay 50% of the total Contract bid amount upon installation of the wireless radios, antennas, and other components of the wireless system and completion of the stand-alone site testing acceptance. The Department will pay 25% of the total Contract bid amount upon completion of the Final Project Acceptance. The total sum of all payments cannot exceed the original Contract amount for this item.

Payment for wireless systems made under:

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<tr>
<td>Item No. 926</td>
<td>2.4 or 5 GHz Wireless Ethernet System, Type 2</td>
<td>Per each</td>
</tr>
<tr>
<td>Item No. 926</td>
<td>2.4 or 5 GHz Wireless Backhaul Ethernet System, Type 3</td>
<td>Per each</td>
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<tr>
<td>Item No. 926</td>
<td>4G Cellular Wireless Ethernet System, Type 4</td>
<td>Per each</td>
</tr>
</tbody>
</table>
**Section 926—Wireless Communications System**

<table>
<thead>
<tr>
<th>Item No. 926</th>
<th>Wireless Radio Survey</th>
<th>Lump sum</th>
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</thead>
</table>

### 926.5.2 Training

The Department will pay 25% of the total Contract bid amount for training upon approval of the Training Plan. The Department will pay the remaining 75% after completion of training described in Section 940.2.05. The total sum of all payments cannot exceed the original Contract amount for this item.

Payment for training is made under:

<table>
<thead>
<tr>
<th>Item No. 926</th>
<th>Training</th>
<th>Lump Sum</th>
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</table>
DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

SUPPLEMENTAL SPECIFICATION

Section 936—Closed-Circuit Television (CCTV) Camera System

Delete Section 936 in its entirety and substitute the following:

936.1 General Description

Furnish, install, test, and provide training for closed circuit television (CCTV) field equipment and materials as shown in the Contract documents.

936.1.1 Definitions, Acronyms, and Abbreviations

A. Definitions

1. CCTV Camera System, Type 1 Internet Protocol (IP) Pan-Tilt-Zoom (PTZ), High Definition (HD), Dome Type Camera, Non-Pressurized
2. CCTV Camera System, Type 1P Same as Type 1 except Pressurized
3. CCTV Camera System, Type 2 IP PTZ, HD, Turret/Positioning Type Camera, Non-Pressurized
4. CCTV Camera System, Type 2P Same as Type 2 except Pressurized
5. CCTV Camera System, Type 3 IP Fixed, HD, Barrel or Box Type Camera, Non-Pressurized
6. CCTV Camera System, Type 3P Same as Type 3 except Pressurized

B. Acronyms and Abbreviations

Refer to Sections 101.01 and 940.1.01 for a list of acronyms, abbreviations, and common terminology used throughout the ITS specifications.

936.1.2 Related References

A. GDOT Standard Specifications

1. Section 150–Traffic Control
2. Section 639–Strain Poles for Overhead Sign and Signal Assemblies
3. Section 647–Traffic Signal Installation
4. Section 682–Electrical Wire, Cable, and Conduit
5. Section 694–Weather Monitoring and Reporting System
6. Section 922–Electrical Wire & Cable
7. Section 923–Electrical Conduit
8. Section 924–Miscellaneous Electrical Materials
Section 936—Closed-Circuit Television (CCTV) Camera System

9. Section 925—Traffic Signal Equipment
10. Section 926—Wireless Communications Equipment
11. Section 939—Communication and Electronic Equipment
12. Section 940—ITS General Requirements

B. Referenced Industry Standards and Documents

It is the Contractor's responsibility to utilize the standards, codes, manuals, and guidelines that apply to the work required to complete this Project.

All CCTV camera materials are to be consistent and compliant with the latest version or edition of the standards and industry practices as specified.

4. American Society of Civil Engineers (ASCE) 7, Minimum Design Loads and Associated Criteria for Buildings and Other Structures.
12. NTCIP 1205, “National Transportation Communications for ITS Protocol Object Definitions for CCTV Camera Control v01.08,” latest edition.
Section 936—Closed-Circuit Television (CCTV) Camera System

936.1.3 Submittals
Refer to Section 940.2.02 for submittal requirements. Requirements for materials and components are specified herein.

936.2 Materials

936.2.1 CCTV Camera System Requirements

Provide a CCTV camera system for outdoor use with internal video encoder, weather-tight camera casing or enclosure, outdoor-rated cabling, Power-over-Ethernet (PoE) injector for powering the IP camera, surge protection, mounting brackets and hardware, network patch cables, and any other ancillary and incidental materials required or needed to provide a complete CCTV camera system.

A. General Requirements

1. Manufacture in an International Organization for Standardization (ISO)-9001 certified manufacturing facility that is regularly engaged in the production of the materials described in this section.
2. Provide commercial-off-the-shelf only equipment and materials that are of new manufacture and previously unused.
3. Provide all equipment and materials of like kind and function of the exact same manufacturer, model, part number, revision, and firmware.
4. Use the most stringent material requirement for this Contract if a conflict or difference exists between the specified industry standards and practices listed in Section 936.1.02(B) and these minimum standard specifications. Notify and resolve with the Department or authority having jurisdiction (AHJ) of any such conflicts or differences prior to procurement of materials and components.
5. Support an open and published application programming interface or software development kit that provides the necessary information for integration of functionality into third party applications and the users’ central control system environment.

B. CCTV Camera Requirements

1. Image Sensor and Scanning: Provide a progressive scan digital complementary metal-oxide semiconductor (CMOS) or charge-coupled-device (CCD) image sensor.
2. Image Resolution: Support at a minimum the following resolutions.
   a. High Definition Television (HDTV) User-configurable 1080P (1920 x 1080) to 320 x 180 pixel array.
   b. HDTV User-configurable 720P (1280 x 720) to 320 x 180 pixel array.
3. Frame Rate: Allow user-configurable frame rates from 5 up to 30 frames per second (fps) with a default of 30fps.
4. Camera Format: Provide removable Infrared (IR)-cut filter, providing day (color) and night (monochromatic) functionality.
6. Image Processing:
   a. Provide automatic and manual electronic shutter speed setting that is user selectable from 1/2 second to 1/30,000 second at 60 Hz.
   b. Provide automatic and manual user selectable automatic gain control.
   c. Provide automatic and manual user selectable white balance control.
   d. Provide on/off backlight compensation operation with user control.
   e. Provide on/off wide dynamic range operation with user controls and manual override option.
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f. Provide automatic and manual user selectable defog mode.

g. Provide on/off electronic image stabilization (EIS) algorithms integrated within the camera assembly system.
   i. Provide compensation algorithms based on those particular movement wavelengths associated with
      vibration present at the roadside or pole movement (e.g., 5 Hz and 10 Hz sinusoidal frequencies at a
      minimum).
   ii. Ensure EIS function automatically pauses while PTZ functions are occurring and restores when no PTZ is
       occurring.
   iii. Provide stabilization such that standard Department of Transportation placards with a size of 1 ft (0.3 m) by
        1 ft (0.3 m) are continuously legible in conjunction with viewing specification and maximum zoom level at
        a distance of 500 ft (152 m).

7. **Lens**:

   a. For Type 1, 1P, 2, and 2P cameras, provide an integrated zoom lens assembly for each camera with the
      following features:
         i. An aperture f-stop of f/1.6 (wide) or better zoom lens with variable focal lengths.
         ii. A minimum 30X optical zoom and 2X digital zoom.
         iii. Automatic switching from optical zoom to digital when optical zoom range is exceeded.
         iv. Adjustable zoom speed.
         v. Automatic and manual user selectable focus control.
         vi. Automatic and manual user selectable iris control to compensate for changes in scene illumination to
             maintain constant video-level output within sensitivity specifications.

   b. For Type 3 and 3P cameras, provide a varifocal lens for each camera with the following features:
      i. An aperture f-stop of f/1.4 (wide) or better.
      ii. A horizontal angular field of view of 46 degrees (wide angle) to 9 degrees (telephoto), typical.
      iii. Adjustable zoom remotely through the camera’s web interface. Final focus to be adjustable through
           camera’s web interface.

8. **Sensitivity**: Provide a camera that has useable video at the following ambient low light conditions:

   a. Scene Illumination; F-stop set at wide open at 50 percent video (50 Institute of Radio Departments [IRE])
   b. 1.0 Lux (0.1 fc) at 1/30 shutter, color mode
   c. 0.1 Lux (0.01 fc) at 1/30 shutter, monochromatic (black and white) mode

C. **Pan-Tilt (P/T) Positioning Drive Requirements**

1. **P/T Range and Speed**:

   a. Provide Type 1, 1P, 2, and 2P camera system that has an integrated P/T unit meeting the following minimum
      requirements:
      i. Pan Range: 360 degrees, full endless or continuous rotation movement.
      ii. Pan Manual Speed: variable up to 90 degrees per second (minimum), user adjustable through the full speed
          range.
      iii. Pan Preset Speed: minimum 180 degrees per second.
      iv. Preset Pan Repeatability: ±0.36 degree, or <0.10 percent or better.
v. Tilt Range: minimum of 180 degrees total tilt range for Type 1 and 1P cameras and minimum 130 degrees total tilt range for Type 2 and 2P cameras.

vi. Tilt Manual Speed: variable up to 90 degrees per second (minimum), user adjustable through the full speed range.

vii. Tilt Preset Speed: minimum 180 degrees per second.

viii. Preset Tilt Repeatability: ±0.36 degree, or <0.10 percent or better.

b. Provide an automatic electronic image inversion or “auto flip” functionality that shall automatically rotate the image 180 degrees electronically when following a moving object passing under the camera. No mechanical stops are permitted.

c. Provide proportional zoom control allowing variable P/T speeds based on “zoom” position. This is to scale the maximum P/T speed, while maintaining variable speed capability, throughout the zoom range of the camera.

2. P/T Preset Functions: Provide Type 1, 1P, 2, and 2P camera system that has P/T presets meeting the following minimum requirements:
   a. A minimum of 64 presets for PTZ and focus settings.
   b. A minimum of eight tours (sequences) that allow the camera to automatically move between selected presets using an individual speed and viewing dwell time for each preset.
   c. A minimum of eight programmable blackout privacy masks or zones.

D. Video Encoding Requirements

1. Encoding Standards: Comply with the following standards:
   a. ISO/IEC 14496-10, Advanced Video Coding (H.264), Baseline, Main and High Profiles
   b. Motion JPEG (MJPG)

2. Video Standards: Comply with the following HDTV video standards in regards to resolution, frame rate, aspect ratio, and color fidelity:
   a. SMPTE 296M (HDTV 720P)
   b. SMPTE 274M (HDTV 1080P)

3. Video Stream Format and Configuration:
   a. Provide simultaneous unique video streams that are independently and individually configurable that meet the following minimum requirements:
      i. Stream 1: H.264 Baseline, Main or High Profile
      ii. Stream 2: H.264 Baseline, Main or High Profile
      iii. Snapshot: JPG full-frame capture
   b. Provide the following encoding parameters minimum ranges and operation, that can be independently and individually configurable by the user for each stream:
      i. Target multicast address, port and time-to-live (TTL) setting
      ii. Video compression technology and levels: H.264 Baseline, Main or High Profile for video and JPG/MJPG for snapshot captures or full-frame captures from a video stream
      iii. Image resolution of 1080P (1920 x 1080) to 320 x 180 or 720P (1280 x 720) to 320 x 180
      iv. Frame rate: adjustable 5 to 30 fps (North American, 60Hz)
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v. Bandwidth and encoding bit rate control: variable bit rate or constant bit rate/maximum bit rate selectable from 192 Kbps to 8 Mbps

vi. Group of Pictures length

c. Provide simultaneous and continuous encoding and streaming for a minimum of three video streams. The activation of one, two, or three simultaneous streams shall not result in a performance degradation of any video stream, video image, control function, or device management interface. The video streams shall be capable of providing the following minimum requirements:

i. Stream 1: 4 Mbps/1920 x 1080/Main Profile/30 fps/RTP

ii. Stream 2: 384 Kbps/720 x 480/Main Profile/15 fps/RTP

iii. Snapshot: 1920 x 1080/120 second capture interval

4. **Video Compatibility**: Ensure encoded streams are fully compatible with the GDOT Central software decoding system and with VLC (Video LAN Client) Ver. 2.1.3.

5. **Video Snapshot**:

a. Provide JPG snapshots from either a dedicated stream or from any of the video streams and image transfer via File Transfer Protocol (FTP) either by push or pull at a user-defined interval between 60 and 300 seconds.

b. Include on-screen display (OSD) capabilities in the snapshot images.

c. Provide target FTP server settings including connection credentials for push function.

d. Provide a minimum space for 32 characters for the snapshot filename for push function.

6. **Management System and User Interface Requirements**:

a. Manage encoder through Hypertext Transfer Protocol (HTTP)/HTTP Secure (HTTPS) and Secure Shell (SSH).

b. Provide a built-in web server user interface making video, status, and configuration available to multiple clients in a standard operating system and browser environment using HTTP, without the need for any additional software of any kind, except video player plugins solely for displaying a live image stream of the video output.

c. Provide web server user interface that supports access to all configurable parameters in the CCTV camera system, without the need for any separate textual or line commands of any kind.

d. Provide user-configurable password-protected accounts with at least one full administrative and one read/view permissions profile.

e. Reset or reboot and upload firmware via the methods listed above.

i. Update the firmware in the encoder from a network connection.

ii. Access the firmware number, IP address, and equipment configuration.

7. **On-Screen Display (OSD)**: Provide a camera system that meets the following minimum OSD requirements:

a. Provide static text insertion on streams and insert a minimum of one line of user configurable text messages with support for date and time of at least 40 ASCII characters in length.

b. Provide text insertion that scales appropriately or is independently configurable for different video image size resolutions.

c. Provide JPG, BMP, or PNG image insertion on streams in the upper portion of the image, using image file(s) uploaded by the user and stored in the encoder’s memory and configuration. Text display on the side of the image is prohibited.

d. Provide the capability to insert a different image file for each stream.
8. **Configuration Backup**: Provide automatic recovery from an over or under voltage condition when prime power has returned to the tolerance values specified herein.
   a. Store configuration parameters in non-volatile memory.
   b. Ensure no reprogramming or manual adjustments are required upon power recovery.

E. **Network Requirements**

1. **Network Format**: Comply with Ethernet compliant IEEE 802.3, 802.3u, and 802.3x; 10/100 Mbps or higher, auto sensing full or half-duplex operations.

2. **Network Hardware Interface**: Equip with a minimum of one 10BASE-T/100BASE-TX PoE Ethernet-port using an IP66 rated RJ-45 weathertight connector or other Ethernet-compatible locking weathertight connector.

3. **Video Encapsulation**: Provide encapsulation of each of the video streams in User Datagram Protocol (UDP) packet and transmission control protocol (TCP) packets, depending on stream configuration, for network transmission.


5. **Camera Protocols**: Support NTCIP 1205, Open Network Video Interface Forum (ONVIF) or other as directed by the Department or AHJ.
   a. Comply with NTCIP objects determined mandatory and optional by the Department. Contact the Department for the current list.
   b. Comply with ONVIF Profile S requirements determined mandatory by the Department. Contact the Department for the current list.

6. **Video Network Transmission**:  
   a. Support both unicast (one-to-one) and multi-cast (one-to-many) streams simultaneously.
   b. Allow for video to be transported over:
      i. RTP (Unicast and Multicast)
      ii. RTP over RTSP (Unicast)
      iii. RTP over RTSP over HTTP (Unicast)
      iv. HTTP/HTTPS tunneling (Unicast)

7. **IP Addresses**:
   a. Support both fixed IP addresses and dynamically assigned IP addresses provided by a DHCP server.
   b. Support static management interface IP addressing (classes A, B, and C).
   c. Support static IP addressing of the multi-cast group individually and independently for each stream.

F. **Electrical Requirements**

1. **PoE**: Provide PoE power to the camera system meeting the following minimum requirements:
   a. Provide a standalone PoE injector. PoE service through the use of a PoE capable Ethernet switch is not permitted.
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b. Select PoE injectors that are based on power requirements of the camera system as recommended by the manufacturer conforming to the following PoE standards:
   i. PoE+ in compliance with IEEE 802.3at (latest revision)
   ii. PoE++ in compliance with IEEE 802.3bt (latest revision)

c. Mount PoE injectors to wall or panel or DIN-rail mount within the Intelligent Transportation System (ITS) field cabinet as approved by the Department.

d. Meet the same environmental requirements as the outdoor-rated elements of the CCTV system.

2. Outdoor-Rated Cat-6 Cable: Provide outdoor-rated, shielded Cat-6 cabling from the PoE injector to the camera encoder meeting the following minimum requirements:
   b. Comply with ICEA 5-56-434 standard for communications cables for outdoor use.
   c. Provide eight (four STP) insulated 22 to 23 American Wire Gauge (AWG), solid copper conductors with polyolefin insulation, arranged in four color-coded twisted-pairs.
   d. Provide modular IP66-rated RJ-45 male push-pull connectors with eight-position non-keyed and eight gold anodized pins or other Ethernet-compatible locking weathertight connector.

3. Surge Protection: Provide single-channel, in-line surge protection for the Cat-6 cabling meeting the following minimum requirements:
   a. Comply with TIA-568-A/B.
   b. Comply with UL 497B requirements.
   c. Provide a fully shielded RJ-45 connector.
   d. Provide PoE+ and PoE++ power, IEEE 802.3at and 802.3bt.
   e. Test according to Telcordia GR-1089-CORE and IEC EN 61000-4-5.
   f. Provide a maximum cut-off voltage of 60 VDC and greater.
   g. Provide protection modes of line to line, line to ground, and shield to ground.
   h. Provide a maximum surge current (per pin) line to ground (8/20 µs) of 100 A, typical.
   i. Provide a maximum surge current shield to ground (8/20 µs) of 5 kiloamps, typical.
   j. Provide heavy-duty single point ground.
   k. Ensure it can be wall or panel or DIN-rail mounted.
   l. Provide protection against corrosion and UV degradation.

G. Mechanical Requirements

1. Camera Casing or Enclosure (Non-Pressurized):
   a. Provide a casing or enclosure that is manufactured in compliance with IEC 60529 IP66, NEMA 4X, and IK08 ratings or greater.
   b. Provide camera assembly that meets or exceeds the requirements stated above without the need for additional components such as mounting brackets and hardware to achieve the stated ratings.
   c. Provide high-impact, non-metallic UV-stabilized material of a light color or an aluminum material with a heat-cured paint coating or powder coating of an equivalent color.
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d. Provide viewing windows constructed of an optically corrected acrylic material designed to mitigate degradation of materials and yellowing due to prolonged exposure to UV rays or as approved by the Department.

e. Protect interior of casing by providing weatherproof glands or grommets for cabling to maintain IP rating.

f. Provide camera and housing with measures to protect against water, dust, corrosive elements, and insect intrusion into the camera casing or housing.

g. Provide a housing that is secure from unauthorized entries and vandals.

2. Camera Casing or Enclosure (Pressurized):

a. Meet the casing or enclosure requirements specified in Section 936.2.01.G.1.

b. Meet the following minimum pressurization requirements:

   i. Provide a Schrader inlet valve for pressurized extra dry nitrogen.

   ii. Provide an operating pressure range of 3 to 7 pounds per square inch (psi) (21 to 48 kPa).

   iii. Provide a pressure relief for protection against overpressure.

3. Sunshield: Provide a sunshield to reduce the solar heating of the camera casing or enclosure.

4. Heating and Ventilation:

a. Provide a heater and blower function to maintain internal temperatures within the manufacturer’s operating temperatures for temperature ranges internal to the camera unit not conforming to the environmental requirements in Section 936.2.01(H)(1).

b. For Type 1 and 1P cameras, provide a conventional mechanical thermostat-controlled heater and circulating blower fan system that is designed to keep the camera equipment within the required operational temperature range and to maintain a clear viewing window.

c. For Type 2, 2P, 3, and 3P cameras, an alternative method may be provided to prevent dust and humidity build-up and to keep internal camera casing temperatures to within operational tolerances defined by the manufacturer as approved by the Department.

5. Mounting Arm Requirements:

a. Attach the camera system to the camera pole as shown in the Contract documents using stainless steel banding, clamps, brackets, and other incidental hardware in compliance with the manufacturer’s recommendations.

b. Provide mounting solution(s) as listed in the Contract. Mounting options will be paid for under separate pay items to include the following:

   i. Type 1: Strap to pole using arm

   ii. Type 2: Attached to luminaire mounting mechanism

   iii. Type 3: Small “candy cane” hook

   iv. Type 4: Large “candy cane” hook

c. Allow for cabling to be routed inside the poles and mounting hardware and protected from exposure to the outside environment.

d. Provide stainless steel mounting hardware and straps in accordance with MIL-STD-810F(3) Method 509 Procedure 1 for exterior salt atmospheres.

e. Provide light-colored camera mounts and mounting bracket arm coatings.
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f. Provide opening in mounting bracket arms to fully enclose the cables. Provide non-metallic cable protection grommets for cable entrances.

g. Provide camera casing mounts that shall accommodate a weight load capacity of no less than 40 lb (18 kg).

H. Environmental Requirements

1. Provide equipment that meets the following operating ambient temperature range and humidity levels:
   a. Camera Assembly and PoE Injectors
      i. −4°F (−20°C) through +140°F (+60°C, maximum).
      ii. Up to 95 percent relative humidity (condensing).
   b. Cat-6 PoE Surge Protector
      i. −40°F (−40°C) to +149°F (+65°C, maximum)
      ii. Up to 95 percent relative humidity (condensing).

2. Provide a camera assembly that meets the following environmental and emission requirements:
   a. Comply with NEMA TS2 Sections 2.1.9, 2.2.3, and 2.2.8 and meet the specified requirements during and after being subjected to a vibration of 5 to 30 Hz up to 0.5 g applied in each of three mutually perpendicular planes for 30 minutes.
   b. Comply with NEMA TS2 Sections 2.1.10, 2.2.4, and 2.2.9 and do not yield permanent mechanical deformation or any damage that renders the unit inoperable when subjected to a shock of 10 g applied in each of three mutually perpendicular planes for 30 minutes.
   c. Comply with IEC 60529 Section 14.2.6 for IP66 or greater rating.
   d. Comply with NEMA 250, Type 4X corrosion requirements for salt environments (i.e., coastal regions).
   e. Ensure that the CCTV camera system the can withstand wind forces of 100 mph (161 kph) with a 20 percent gust factor.
   f. Provide the following Electromagnetic Compatibility (EMC) emission approvals:
      i. FCC Part 15, Subpart B, Class A
      ii. IEC EN 61000-6-4

936.2.2 CCTV Camera Lowering Device (CLD) Requirements

A. General Requirements:

1. Provide a camera lowering device (CLD) for all new CCTV camera poles 60 ft (18.3 m) or greater above ground level unless otherwise shown in the Contract documents.

2. Provide a CLD designed to support and lower a standard CCTV camera system as specified herein and other supporting components without causing damage or degradation of camera operations.

3. Provide the electrical connection between the ITS field cabinet and the camera assembly installed on the lowering device.

4. Ensure that the CLD shall work with and support Cat-6 Ethernet-based PoE camera operations.

5. Provide CLD and external components that are corrosion-resistant powder-coated, galvanized materials, or otherwise protected from the environment by industry-accepted coatings that can withstand exposure to a corrosive environment.
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6. Provide a CLD that can withstand wind forces of 100 mph (161 kph) with a 20 percent gust factor using a 1.65 safety factor.

B. Lowering Cable Requirements:

1. Provide a lowering cable that shall support a minimum of 200 lb (90.7 kg) load.
2. Provide a lowering cable that is stainless steel and located inside conduit within the pole to avoid cable twisting and ensure that only the lowering cable is in motion when the lowering device is operated. All other cables are to remain stable and secure during lowering and raising operations.
3. Provide a design so that the lifting cable does not come into contact with the power or video cables.
4. Ensure that lowering cable accessories, such as connecting links, have a minimum workload rating that meets or exceeds that of the lowering cable.
5. Provide weights and/or counterweights to ensure the alignment for the camera connection can be raised into position without binding and that it can be lowered properly.

C. Disconnect Unit and Connection Requirements:

1. Provide a disconnect unit with a minimum load capacity of 200 lb (90.7 kg) with a 4:1 safety factor.
2. Provide a locking mechanism between the fixed and movable components of the disconnect unit.
3. Provide a minimum of two mechanical latches for the movable assembly to remove all weight from the lowering cable when latched.
4. Provide the fixed unit with a heavy-duty cast tracking guide and a means for latching in the same position each time.
5. Provide capability of securely holding the lowering device and the equipment installed on the lowering device.
6. Provide stainless steel or aluminum interface and locking components.
7. Provide a watertight suspension contact unit with a gasket to seal the interior from dust and moisture without the use of pressurization.
8. Provide connectors that are resistant to UV light degradation.
9. Ensure that male and female matched parts mate together to make a weatherproof, non-corrosive electrical connection between the cable and the camera housing when the camera is fully raised and locked.
10. Ensure the wire leads from both the male and female contacts are permanently and securely fastened into a weatherproof, non-corrosive body.
11. Provide a design to keep contacts protected or provide a method to displace surface contaminants.
12. Ensure any grease or lubricant used on moving parts of the CLD components is recommended by the manufacturer.

D. Camera Lowering Tool Requirements:

1. Provide a camera lowering tool consisting of a portable, lightweight, corrosion-resistant metal frame and winch assembly with a cable, a quick release cable connector, and an adjustable safety clutch.
2. Provide a camera lowering tool that is powered by a 0.5 in chuck, variable speed, and reversible, industrial duty drill, ½ horsepower (minimum). Do not exceed the CLD manufacturer’s maximum rotations per minute.
3. Ensure that the lowering cable winds evenly on the winch drum during operation.
4. Provide a camera lowering tool that is manufactured of durable, corrosion-resistant materials that are powder-coated, galvanized, or otherwise protected from the environment by industry accepted coatings that can withstand exposure to a corrosive environment.
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5. Provide a camera lowering tool that can support itself and the load equipped with a positive braking mechanism to secure the cable reel during raising and lowering operations and to prevent freewheeling or freefall.

6. Provide a minimum of one camera lowering tool plus any additional tools required to operate the lowering device for each set of five poles or fraction thereof. Upon the Final Project Acceptance, the Contractor shall deliver the camera lowering tool(s) to the Department.

E. CLD Pole Provisions:

1. Provide a 1.25 in (3.2 mm) polyvinyl chloride (PVC) conduit to contain the CLD stainless steel lowering cable for the full length of cable run inside the camera pole.

2. Provide new camera poles with appropriate hand-holes, cable entry points, and weather-heads so that all cabling, grounding conductors, lowering device, etc., for the complete CCTV camera and CLD installation are run inside the pole. Include these details on the shop drawing submittals and submit for review and approval by the Department prior to fabrication.

3. Provide a hand-hole of sufficient size to provide access to the camera pole interior and for temporarily securing and operating the lowering tool.

4. Provide a pole-top tenon that is rotatable.

5. Provide an attachment point inside the camera pole for attaching the lowering device cable that is fully accessible from the hand-hole.

6. Provide the attachment point material and means of attachment to the pole of sufficient strength and durability to hold the lowering device cable in place if the camera lowering device were to release at the top of the pole.

936.3 Construction Requirements

Ensure that construction and installation of the equipment, materials, components, and assemblies of the CCTV system specified comply with the CCTV manufacturer’s requirements and recommendations.

936.3.1 Contractor Experience and Qualifications

1. Provide the following documentation:
   a. Provide three current client references for project that were performed by the Contractor and/or sub-contractor for the installation, integration and testing of CCTV camera systems including IP-based PTZ dome and fixed camera systems.
   b. Evidence that the electronic technicians performing installation, configuration, setup, program, and related works are thoroughly trained by the manufacturer in the installation and service of the equipment provided.

936.3.2 Construction Requirements

A. General Installation Requirements

1. Request that the Department establish the utility service as described in Section 682.

2. Mount the camera system assembly and the mounting bracket arm at the cardinal direction and height as shown in the Contract documents, and so the pole is not obstructing the camera’s view of the roadway or traffic signals.

3. Install cables between the camera system assembly and the CCTV camera field cabinet inside new hollow steel or metal or concrete support poles unless otherwise specified. Where devices are installed on existing wood poles, install cabling on the wood poles in conduit risers of minimum 2 in (51 mm) diameter.

4. Provide wiring and cabling meeting the following minimum requirements:
   a. Comply with local, state, and national electrical codes.
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b. Provide wires that are cut to proper length before assembly. It is not acceptable to “double-back” wires to take up slack inside the cabinet.

c. Neatly arrange and dress wiring, firmly lace or bundle it, and mechanically secure the wiring without the use of adhesive fasteners.

d. Organize cables neatly inside the cabinet and secure cables with clamps to minimize movement in the wind and chafing against the pole, device, or bracket.

e. Provide service loops at connection points when connecting to hardware inside the cabinet.

f. No splicing of cables or exposed wiring is allowed.

g. Ensure that wiring entry to the camera casing or enclosure uses watertight fittings.

h. Ensure that wiring entry and exits are made at the side or underneath components; no exposed top entry or exits are permitted. This requirement extends to enclosures, junction boxes, support arms, or any other externally exposed devices.

i. Route and secure wiring and cabling to avoid sharp edges and to avoid conflicts with other equipment or cabling.

j. Route CCTV cables separate from any 120 VAC power wiring or surge suppressor ground wiring.

k. Clearly label all wiring as approved by the Department.

l. Neatly coil and dress between 3 ft (1 m) and 5 ft (1.5 m) of cables in the bottom of the cabinet.

5. Dress and route grounding wires separately from other field cabinet wiring and with the minimum length possible between the surge protector and the ground buss-bar.

6. Do not splice any cable, shield, or conductor used for CCTV camera operation, communications signaling, power supply, or grounding.

7. Provide mechanical components meeting the following requirements:

   a. Provide stainless steel external screws, nuts, and locking washers. Self-tapping screws are not acceptable.

   b. Provide parts that are made of corrosion resistant material; examples include plastic, stainless steel, anodized aluminum, or brass.

   c. Protect materials used in construction from fungus growth and deterioration due to sustained moisture.

   d. Separate dissimilar metals by an inert dielectric material.

B. Camera Lowering Device Requirements

1. Install in accordance with the manufacturer’s installation instructions.

2. Install materials in a neat and professional manner.

3. Coordinate with the Department to determine actual mounting height and azimuth. Typically, the camera lowering system azimuth shall be perpendicular to the mainline lanes.

C. As-Built Documentation

1. Furnish as-built CCTV system wiring diagrams identified by location.

2. Include wiring, cabling, conductor function, connector type, and pinouts in an electronic (PDF) format.

3. Include the height of the camera in feet above the travel lanes.
Section 936—Closed-Circuit Television (CCTV) Camera System

936.3.3 Equipment Configuration and Integration Requirements
Refer to Section 940.2.03 for CCTV equipment configuration and integration requirements.

936.3.4 Testing Requirements
Refer to Section 940.2.04 for CCTV testing requirements.

936.3.5 Training
Refer to Section 940.2.05 for CCTV training requirements.

936.3.6 Warranty and Maintenance Support Services

A. Warranty Requirements:
   1. Ensure that the CCTV camera system, communication cables, and associated components defined herein furnished, assembled, and installed have a manufacturer’s warranty (usual and customary) covering defects in assembly, fabrication, and materials. Include in warranty and support, all contractor or manufacturer activities related to maintenance, removal, and replacement of parts and materials during the period of support.
   2. Provide a minimum warranty length as follows:
      a. CCTV camera assembly and associated components: Minimum of three years.
      b. Cat-6 PoE surge protector: Minimum of five years.
      c. Camera lowering system: Minimum of two years.
   3. If the manufacturer’s warranties for the components are for a longer period, those longer period warranties shall apply.
   4. Ensure warranty periods begin on the date of maintenance acceptance by the Department.
   5. Ensure that the manufacturer’s warranties are continuous throughout the period and shall be fully transferable from the Contractor to the Department and any maintenance consultant/contractor.
   6. Provide maintenance support services and make any replacements required during the warranty period without additional charge for labor, equipment, parts, shipping, and other materials required. Support all system components notwithstanding any supplier's warranties whether written or implied.

B. Maintenance Support Services:
   Refer to Section 940.2.06 for maintenance support services requirements.

936.3.7 Project Close-out Requirements
Refer to Section 940.2.07 for CCTV project close-out requirements.

936.4 Measurement
The CCTV camera system and training complete, in place, accepted, and of the kind, size, and type specified is measured as follows:

A. CCTV Camera System Pay Items
   Item No. 936-2000 – CCTV System, Type 1 (EA)
   Item No. 936-2050 – CCTV System, Type 1P (EA)
   Item No. 936-2100 – CCTV System, Type 2 (EA)
Section 936—Closed-Circuit Television (CCTV) Camera System

Item No. 936-2150 – CCTV System, Type 2P (EA)
Item No. 936-2200 – CCTV System, Type 3 (EA)
Item No. 936-2250 – CCTV System, Type 3P (EA)

The CCTV camera system will be measured for payment by the number installed, complete, functional, and successfully completed final acceptance testing including IP-based camera assembly with internal video encoder, camera lens, P/T positioning drive, camera casing or enclosure and sunscreen. CCTV camera system shall also include ITS field cabinet components, including but not limited to, PoE injector, outdoor-rated cabling and associated wiring, network patch cable, connectors, terminal blocks, surge protector, weather heads (as required or needed), grounding to site ground, and video encoder configuration. This price shall be full compensation for labor, tools, materials, equipment, and incidentals necessary to complete the work.

B. Camera Mounting Pay Items

Item No. 936-2901 – CCTV System, Mounting Arm, Type 1 (EA)
Item No. 936-2902 – CCTV System, Mounting Arm, Type 2 (EA)
Item No. 936-2903 – CCTV System, Mounting Arm, Type 3 (EA)
Item No. 936-2904 – CCTV System, Mounting Arm, Type 4 (EA)

C. Camera Lowering Device (CLD) Pay Item

Item No. 936-XXXX – Camera Lowering Device (EA)

D. Camera Lowering Tool Pay Item

Item No. 936-XXXX – Camera Lowering Tool (EA)

E. Training Pay Item

Item No. 936-8500 – Training (Lump Sum)

Training is measured as a lump sum for supplies, equipment, materials, handouts, travel, and subsistence necessary to conduct the training.

Measurement Notes:

Submittal

Submittal requirements are included in Section 940 and shall not be paid for separately and shall be considered as incidental to the CCTV camera system pay item.

Testing

Testing requirements are included in Section 940 and shall not be paid for separately and shall be considered as incidental to the CCTV camera system pay item.

NaviGAtor Integration

NaviGAtor integration requirements are included in Section 940 and shall be paid for under 940-1000.

936.5 Basis of Payment

936.5.1 CCTV Camera System

CCTV systems of the type specified in the Contract documents are paid for at the Contract Unit Price. Payment is full compensation for furnishing and installing or delivering the CCTV camera system.
Section 936—Closed-Circuit Television (CCTV) Camera System

The Department will pay 25 percent of the total Contract bid amount for properly stored materials. The Department will pay 50 percent of the total Contract bid amount upon installation of the physical elements of the CCTV camera system and completion of the stand-alone/site testing acceptance. The Department will pay 25 percent of the total Contract bid amount upon completion of the Final Project Acceptance. The total sum of all payments cannot exceed the original Contract amount for this item.

Payment for CCTV camera systems is made under:

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Description</th>
<th>Per each</th>
</tr>
</thead>
<tbody>
<tr>
<td>936</td>
<td>CCTV System, Type 1</td>
<td></td>
</tr>
<tr>
<td>936</td>
<td>CCTV System, Type 1P</td>
<td></td>
</tr>
<tr>
<td>936</td>
<td>CCTV System, Type 2</td>
<td></td>
</tr>
<tr>
<td>936</td>
<td>CCTV System, Type 2P</td>
<td></td>
</tr>
<tr>
<td>936</td>
<td>CCTV System, Type 3</td>
<td></td>
</tr>
<tr>
<td>936</td>
<td>CCTV System, Type 3P</td>
<td></td>
</tr>
<tr>
<td>936</td>
<td>Camera Lowering Device</td>
<td></td>
</tr>
<tr>
<td>936</td>
<td>Camera Lowering Tool</td>
<td></td>
</tr>
<tr>
<td>936</td>
<td>CCTV System, Mounting Arm, Type 1</td>
<td></td>
</tr>
<tr>
<td>936</td>
<td>CCTV System, Mounting Arm, Type 2</td>
<td></td>
</tr>
<tr>
<td>936</td>
<td>CCTV System, Mounting Arm, Type 3</td>
<td></td>
</tr>
<tr>
<td>936</td>
<td>CCTV System, Mounting Arm, Type 4</td>
<td></td>
</tr>
</tbody>
</table>

936.5.2 Training

The Department will pay 25 percent of the total Contract bid amount for training upon approval of the Training Plan. The Department will pay the remaining 75 percent after completion of training described in Section 940.2.05. The total sum of all payments cannot exceed the original Contract amount for this item.

Payment for training is made under:

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Description</th>
<th>Lump Sum</th>
</tr>
</thead>
<tbody>
<tr>
<td>936</td>
<td>Training</td>
<td></td>
</tr>
</tbody>
</table>
DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

SUPPLEMENTAL SPECIFICATION

Section 939—Communications and Electronic Equipment

Delete Section 939 in its entirety and substitute the following:

939.1 General Description
Furnish, install, test, and provide warranty and training for communications and electronic equipment and materials as shown in the Contract documents.

939.1.1 Definitions, Acronyms, and Abbreviations

A. Definitions
1. Field Switch, Type A: Layer 2, minimum 6 copper ports and 2 Small Form Factor Plug-in (SFP) 1 Gbps fiber ports.
2. Field Switch, Type B: Layer 2, minimum 6 copper ports and 3 SFP 1 Gbps fiber ports.
3. Field Switch, Type C: Layer 2, minimum 1 copper port and 7 SFP 1 Gbps fiber ports.
4. Field Switch, Type D: Layer 2 or 3 upgradeable, minimum 4 copper ports and 4 dual-purpose 1 Gbps ports.
5. Field Switch, Type E: Layer 2 or 3 upgradeable, minimum 8 copper ports and 4 dual-purpose 1 Gbps ports.
6. SFP, Type 1: LX optics for shorter distances.
7. SFP, Type 2: ZX optics for longer distances.
9. Routing Switch, Hub, Type B: Layer 3, minimum 48 ports at 10/100/1 Gbps copper and 4 ports at 1 Gbps SFP.
10. Field Cabinet, Type 1: A modification of the Joint Committee (JC) Standard ITS Cabinet Housing #2.
11. Field Cabinet, Type 2: JC Standard ITS Cabinet Housing #2.
13. Field Cabinet, Type 4: JC Standard ITS Cabinet Housing #3.

B. Acronyms and Abbreviations
Refer to Sections 101.01 and 940.1.01(A) for a list of acronyms, abbreviations, and terminology used in this section and throughout these ITS specifications.

939.1.2 Related References

A. GDOT Standard Specifications
1. Section 150 – Traffic Control
2. Section 639 – Strain Poles for Overhead Sign and Signal Assemblies
Section 939—Communications and Electronic Equipment

3. Section 647 — Traffic Signal Installation
4. Section 682 — Electrical Wire, Cable, and Conduit
5. Section 694 — Weather Monitoring and Reporting System
6. Section 922 — Electrical Wire & Cable
7. Section 923 — Electrical Conduit
8. Section 924 — Miscellaneous Electrical Materials
9. Section 925 — Traffic Signal Equipment
10. Section 926 — Wireless Communications Equipment
11. Section 939 — Communication and Electronic Equipment
12. Section 940 — ITS General Requirements

B. Referenced Standards and Documents

1. Refer to Section 940.1.01(B) for a list of standards and documents referenced in this section and throughout the ITS specifications.
2. Ensure that all communications and electronic equipment and materials are consistent and compliant with the latest version or edition of the standards and industry practices as specified.

939.1.3 Submittals

Refer to Section 940.2.02 for submittal requirements. Requirements for communications and electronic equipment materials are specified herein.

939.2 Materials

Provide communication and electronic equipment that meet following minimum general requirements:

939.2.1 General Requirements

1. Manufacture in an International Organization for Standardization (ISO) 9001-certified manufacturing facility that is regularly engaged in the production of the materials described in this section.
2. Provide only proven and commercial-off-the-shelf only equipment and materials.
3. Provide equipment and materials that are of new manufacture and previously unused.
4. Provide all equipment and materials that are of like kind and function from the same manufacturer, using the same model, part number, revision, and firmware.
5. Use the most stringent material requirement for this Contract if a conflict or difference exists between the specified industry standards and practices listed in Section 939.1.02(B) and these minimum standard specifications. Notify and resolve with the Department or authority having jurisdiction of any such conflicts or differences prior to procurement of materials and components.

939.2.2 Network Field Switch Requirements

A. General Requirements

1. Provide one or more of the network field switch types listed in Table 1 as specified in the Contract documents:
Section 939—Communications and Electronic Equipment

### Table 1 – Network Field Switch Types

<table>
<thead>
<tr>
<th>Type</th>
<th>Layer Capability</th>
<th>Ethernet Port Configuration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type A</td>
<td>Layer 2</td>
<td>Minimum 8 ports total including 2 x Gigabit-Ethernet SFP modules and 6 10/100Base-T/TX ports</td>
</tr>
<tr>
<td>Type B</td>
<td>Layer 2</td>
<td>Minimum 9 ports total including 3 x Gigabit-Ethernet SFP modules and 6 10/100Base-T/TX ports</td>
</tr>
<tr>
<td>Type C</td>
<td>Layer 2</td>
<td>Minimum 8 ports total including 7 x Gigabit-Ethernet SFP modules and 1 10/100Base-T/TX ports</td>
</tr>
<tr>
<td>Type D</td>
<td>Layer 2 or Layer 3</td>
<td>Minimum 8 ports total including 4 dual-purpose uplink or downlink ports that can be used for 10/100/1000BASE-T/TX ports or 100/1000 Mbps SFP modules, and 4 10/100/1000Base-T/TX ports</td>
</tr>
<tr>
<td>Type E</td>
<td>Layer 2 or Layer 3</td>
<td>Minimum 12 ports total including 4 dual-purpose uplink or downlink ports that can be used for 10/100/1000Base-T/TX ports or 100/1000 Mbps SFP modules, and 8 10/100/1000Base-T/TX ports</td>
</tr>
</tbody>
</table>

2. Ensure compatibility and interoperability of network field and routing switches with the existing GDOT network by support of features and implementation of common standards that enable switches to work together and minimize integration effort.

3. Provide the following network field switch interfaces:
   a. Fiber Ports: 1000BaseSFP slot or 100/1000BaseSFP slot.
   b. RJ-45 Ports: 10/100Base-T(X) or 10/100/1000Base-T(X) auto negotiation speed and capable of being manually set to half-duplex or full-duplex.
   c. Console Port along with any adapter cables as needed and approved by the Department.
   d. LED Indicators: Power on/off and network status per port (transmit, receive, link, and speed).

4. Operate with non-blocking, store and forward, switching at full wire speed.

5. Provide a minimum Mean Time Between Failure (MTBF) of 200,000 hours using Telcordia SR-332, Method 1, Case 3 or MIL-HDBK-217J standards.

6. Comply with IEEE 802.3 for 10Base-T standards specifications.

7. Comply with IEEE 802.3u for 100Base-T(X) standard specifications.

8. Comply with IEEE 802.3ab for 1000Base-T(X) standard specifications.

9. Comply with IEEE 802.3z for 1000Base-X standard specifications.

10. Provide a fan-less (no fan) design.

### B. Network Capabilities and Features

1. Provide support for multicast with Internet Group Management Protocol (IGMP) v1/v2/v3 snooping and IGMP filtering.

2. Comply with IEEE 802.3x (Flow Control) standard.

3. Comply with IEEE 802.1p (Class of Service or Priority Queuing) standard.

4. Comply with IEEE 802.1Q (VLAN tagging) standard per port.

5. Comply with IEEE 802.1D (Spanning Tree Protocol) and IEEE 802.1w (Rapid Spanning Tree Protocol) standards.

6. Comply with IEEE 802.3ad (Link Aggregation or Port Trunk) standard for a minimum of two groups of four ports.
Section 939—Communications and Electronic Equipment

C. Security Requirements

1. Provide the capability to configure static Media Access Control (MAC) addresses access.
2. Provide the capability to disable automatic address learning per ports; known hereinafter as Secure Port. Secure Ports only forward statically configured MAC Addresses.
3. Provide the capability to trap and alarm upon any unauthorized MAC address and shutdown. Require administrator to manually reset the port before communications are allowed.
5. Provide support for Hyper Text Transfer Protocol (HTTP) and HTTP Secure (HTTPS).
6. Provide support for Secure Sockets Layer (SSL).

D. Network Management Requirements

1. Provide network management capabilities that are compatible with the existing GDOT network management consisting of Cisco Prime centralized enterprise management software supporting remote management.
2. Provide network field switch that is password manageable with a minimum of one read-only profile and one full administration profile.
4. Provide implementation of Link Layer Discovery (LLDP) protocol as defined in IEEE 802.1ab (Station and Media Access Control Connectivity Discovery).
5. Provide full implementation of Remote Network Monitoring (RMON) I statistics, history, alarms, and events objects.
6. Provide network field switch that can mirror any port to any other port within the network field switch.
7. Provide network field switch that can be managed remotely by an enterprise software/program for configuration, reporting, updates, and monitoring of alarms.
8. Provide environment monitoring capabilities.
9. Provide management capabilities via a serial maintenance/console serial port (local) and over the network (remote).
10. Provide support for HTTP (Embedded Web Server) with SSL.
11. Provide full implementation of RFC 783 (TFTP) to allow remote firmware upgrades.

E. Additional Requirements for Network Field Switch Types D and E

1. Provide, in the quantity specified in the Contract documents, Gigabit-Ethernet Combo ports, where each Gigabit-Ethernet Combo port is defined as a single interface that can be used as a 10/100/1000Base-T/TX ports or 100/1000Base SFP GBIC socket.
2. Provide a card slot for a field removable SanDisk (SD) read-write memory card (included) that can store switch operating system modules and switch configuration modules, and is addressable/manageable from the switch’s management interface and built-in memory system.
3. Provide capability for booting from and loading configuration from the removable memory card slot or from the built-in memory, as defined by the user.
4. Provide capability for push/pull of switch operating system modules and switch configuration settings from the GDOT network management system.
5. Provide capability for conversion from Layer 2 to Layer 3 switch and routing protocols, as specified in Section 939.2.03, with only a change in the switch operating system and/or license.
Section 939—Communications and Electronic Equipment

F. Mechanical and Cabling Requirements
   1. Unless otherwise specified in the Contract documents, provide network field switches that are DIN rail panel mountable. Rack-mounted DIN rails may be installed if cabinet space is available and approved by the Department. Rack-mountable switches may be used if approved by the Department. Shelf mount is not permitted.
   2. Provide corrosion-resistant hardware and materials for mounting within the field cabinet.
   3. Provide a quantity of fiber optic patch cords that matches the number of populated optical ports on the network field switch, in accordance with Section 935, with ST connectors on one end (at the FPP/FDU) and an LC connector on the other end (at the network field switch).
   4. Provide rubber dust caps or covers with insertion and removal handles that completely seal the port opening for unused copper and optical ports.

G. Electrical Requirements
   1. Provide network field switch that is capable of operating over minimum input voltage range of 108 VAC to 132 VAC at 50/60 Hz (±5%, maximum).
   2. Provide network field switch with power conversion/supplies (24 VDC or 24 VAC) as specified herein and provide regulation necessary to support electronics operation.
   3. Comply with IEC EN 61000-4-5 surge immunity for network equipment.
   4. Ensure that power transformers are a “fastening mechanism” type. No plug-in types will be permitted. Corded transformers are to be mountable with neatly secured power cords.

H. Environmental Requirements
   1. Provide hardened network field switch including power supply that comply with NEMA TS 2 Sections 2.1.7, 2.1.8, and 2.1.9 temperature, humidity, vibration, and shock testing requirements.

939.2.3 Network Routing Switch Requirements

Provide a network routing switch with the minimum number and types of ports along with functionality according to the Routing Switch Type indicated in the Contract documents.

A. General Requirements
   1. Provide one or more of the network routing switch types listed in Table 2 as specified in the Contract documents:

<table>
<thead>
<tr>
<th>Type</th>
<th>Layer Capability</th>
<th>Ethernet Port Configuration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type A</td>
<td>Layer 3</td>
<td>Providing a minimum 48 1/10/25Gbps SFP+ fiber ports + 6 40/100Gbps QSFP28 fiber uplink ports per switch</td>
</tr>
<tr>
<td>Type B</td>
<td>Layer 3</td>
<td>Providing a minimum 48 10/100/1000 Ethernet copper ports + 4 SFP 1Gbps fiber uplink ports per switch, stackable</td>
</tr>
</tbody>
</table>

   2. Provide network routing switches that are compatible with the existing GDOT routing network consisting of Cisco Nexus 93180YC-FX Layer 3 routing switch (Type A) and Cisco Catalyst 2960XR Layer 3 routing switch (Type B) that can be managed by the Department’s existing network management software.
   3. Populate network routing switch with optical SFPs meeting the minimum SFP requirements in Section 939.2.05.
   4. Provide network routing switch with SFP fiber ports that accept LC fiber optic single-mode connectors.
Section 939—Communications and Electronic Equipment

5. Provide a minimum MTBF of 200,000 hours using Telcordia SR-332, Method 1, Case 3 or MIL-HDBK-217J standards.

6. Provide up to 4,096 VLANs.

7. Provide network routing switch where modules are hot-swappable.

8. Provide network routing switch that can be EIA 19 in (483 mm) rack mounted (one RU per network routing switch, typical).

B. Network Standards and Protocols

1. Provide support for the network standards and Layer 2 and 2+ protocols specified in Section 939.2.02.

2. Provide support for additional network Layer 3 protocols as follows:
   b. Provide full implementation of IGMP v1/v2/v3.
   d. Provide support for Remote Authentication Dial-In User Service (RADIUS) protocol.
   e. Provide full implementation of Routing Information Protocol (RIPv2).
   f. Provide full implementation of Open Shortest Path First (OSPF) protocol.
   g. Provide full implementation of Generic Multicast Registration Protocol (GMRP).
   h. Provide full implementation of Generic VLAN Registration Protocol (GVRP).
   i. Provide full implementation of Protocol Independent Multicast Sparse Mode (PIM-SM).
   j. Provide full implementation of Virtual Router Redundancy Protocol (VRRP).

C. Mechanical and Cabling Requirements

1. Provide network routing switches that are rack mountable.

2. Provide hardware and materials for mounting within the equipment rack that are corrosion resistant.

3. Provide a quantity of fiber optic patch cords that matches the number of populated optical ports on the network routing switch, in accordance with Section 935, with ST connectors on one end (at the FPP/FDU) and an LC connector on the other end (at the network field switch).

4. Provide rubber dust caps or covers with insertion and removal handles that completely seal the port opening for unused copper and optical ports.

D. Electrical Requirements

1. Provide network field switch that is capable of operating over minimum input voltage range of 108 VAC to 132 VAC at 50/60 Hz (±5%, maximum).

2. Comply with IEC 61000-4-5 surge immunity testing requirements.

3. Provide network routing switch with dual redundant power supplies and fans, N+1 configuration, hot swappable, and configured for 120 VAC service.

E. Environmental Requirements

1. Provide network routing switch including power supply that meets following minimum ambient temperature and humidity requirements:
Section 939—Communications and Electronic Equipment

a. Temperature range from +23°F through +113°F (−5°C to +45°C).
b. Relative humidity from 10% through 95%, noncondensing.
c. Comply with NEMA TS 2 Sections 2.1.8 and 2.1.9 vibration, and shock testing requirements.


939.2.4 Reserved

939.2.5 Small Form Factor Plug-in (SFP) Fiber Module Requirements

1. Provide single-mode, dual-fiber SFPs.

2. Provide one of more the following types of full duplex, SFP fiber optical modules as shown in the Contract documents or as required:
   a. Type 1: LX/LH optics for single-mode >10 km (6.2 miles) in length (under ideal conditions).
   b. Type 2: ZX optics for single-mode fiber of > 70 km (43 miles) in length (under ideal conditions).

3. Comply with IEEE 802.3x, 1000Base-LX/LH and 1000Base-ZX standards.

4. Provide fiber optic patch cables as specified in Section 935.2.01(G) with integral optical attenuators if required for optical power control per the network field switch manufacturer’s recommendations.

5. Provide SFPs that are 100% compatible with the network field switch, including any serial number or other identifying information. Only demonstrated proven SFPs that do not require non-default, switch configuration settings are acceptable.

6. Provide SFPs that are hot-swappable to maximize uptime.

7. Support detecting and shutting down one-way link failures using auto-negotiation.

8. Operate as its’ own switched port.

9. Provide network field switch with SFP fiber ports that accept LC fiber optic single-mode connectors.

10. Provide with LC connectors as approved by the Department.

11. Environmental Requirements: Provide SFPs with extended temperature capabilities meeting the following minimum requirements:
   a. Ambient temperature range from +23°F through +185°F (−5°C through +85°C).
   b. Relative humidity from 10% through 95%, non-condensing.

939.2.6 Network Patch Cord Requirements

A. Network Field Switch Patch Cords:

Verify that network field switch patch cords meet ANSI/TIA requirements for Category 6, 4-pair unshielded twisted pair cabling with stranded conductors and RJ-45 connectors meeting the following minimum requirements:

1. Provide patch cords that are factory assembled, connectorized, and certified by the manufacturer to meet the relevant performance standards specified herein.

2. Comply with ANSI/TIA-568-C.2 and UL 444 standards.

3. Provide eight (four STP) insulated 22 to 24 AWG, solid copper conductors arranged in four color-coded twisted-pairs.

4. Provide modular RJ-45 male connectors with 8-position non-keyed and eight gold anodized pins.
Section 939—Communications and Electronic Equipment

5. Ensure that connectors incorporate mechanical cable strain relief and protective boots.

6. Characterize to 600 MHz and provide design margin (headroom) beyond standard Near-End Crosstalk (NEXT), Power Sum NEXT (PSNEXT), Attenuation-to-Crosswalk Ratio (ACR), and Power Sum ACR (PSACR).

7. Provide with lengths of patching from network field switch to equipment inside the field cabinet or equipment rack without strain. Provide custom or standard lengths as required or needed based on final equipment layout and configuration that permits future movement of equipment within the field cabinet or equipment rack.

8. Provide a riser-rated patch cord.

B. Fiber Optic Patch Cords:

Provide fiber optic patch cords that meet the requirements of Section 935.

939.2.7 Reserved

939.2.8 Field Cabinet Requirements

A. General Requirements

1. Provide one or more of the field cabinet types listed in Table 3 as specified in the Contract documents:

<table>
<thead>
<tr>
<th>GDOT Type</th>
<th>Joint Committee ITS Cabinet Standard</th>
<th>Minimum Cabinet Dimension Range</th>
<th>Number of Doors</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Height</td>
<td>Width</td>
</tr>
<tr>
<td>Type 1</td>
<td>Modified ITS Cabinet Housing #2</td>
<td>30 in to 36 in</td>
<td>23 in to 26 in</td>
</tr>
<tr>
<td>Type 2</td>
<td>ITS Cabinet Housing #2</td>
<td>44 in to 47 in</td>
<td>23 in to 26 in</td>
</tr>
<tr>
<td>Type 3</td>
<td>ITS Cabinet Housing #1</td>
<td>64 in to 67 in</td>
<td>23 in to 26 in</td>
</tr>
<tr>
<td>Type 4</td>
<td>ITS Cabinet Housing #3</td>
<td>64 in to 67 in</td>
<td>44 in to 46 in</td>
</tr>
</tbody>
</table>

2. Unless otherwise specified in the Contract documents or directed and approved by the Department, construct all ITS cabinet (field cabinet) housing assemblies in conformance with this Subsection 939.2.08 and the Joint Committee (JC) ITS Cabinet Standard Specifications for Roadside Cabinets v01.02.17b or latest version.

a. Do not include with the ITS field cabinet housing the following:
   i. Police panel and associated wiring.
   ii. Power distribution assembly (PDA) and associated flasher units, and signal power contactor.
   iii. DC power supply unit (24 VDC and 12 VDC).
   iv. Input file and associated sensor units, isolator units, and serial interface unit (SIU).
   v. Output file and associated auxiliary monitor unit, SIU unit, transfer relay unit, and switch pack unit.
   vi. Cabinet monitor unit (CMU) assembly.
   vii. Serial and control bus assemblies and wiring.

b. Unless otherwise specified, configure all field cabinet housing assemblies for pole mounting.
   i. Properly reinforce the holes for pole mounting with metal plates of adequate size and strength welded longitudinally across the inside depth of the field cabinet.
   ii. Where base-mounting of field cabinets is specified, make the field cabinet bottom open and provide an approved base mounting adapter, in accordance with the Department’s Standard Specification for Traffic Signal Equipment.
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B. Field Cabinet Components

1. Rack Cage
   a. Equip all field cabinet housings with the standard EIA 19 in (483 mm) rack cage as described in the JC ITS Cabinet Standard Specifications and as follows:
      i. Do not use unistruts or other rail types.
      ii. Types 1, 2 and 3: Equip field cabinet housings with the standard EIA 19 in (483 mm) rack cage.
      iii. Type 4: Equip field cabinet housings with two standard EIA 19 in (483 mm) rack cages.

2. Cabinet Side Mounting Panels
   a. Fabricate side mounting panels as described in the JC ITS Cabinet Standard Specifications for J Panels and as follows:
      i. Do not provide pre-punched terminal block/bar or component mounting holes, except holes for mounting the panel to the rack cage.
      ii. Do not provide shelf assemblies.
      iii. In all field cabinet types provide side panels that are the full depth of the rack cage and the rack cage height less 2 in (50 mm) at the top and bottom.
   b. In all field cabinet types provide side panels on both sides of each rack cage.

3. Shelf and Drawer
   a. Provide shelf and drawer meeting the following minimum requirements:
      i. Provide drawer that is an aluminum storage compartment mounted in the rack cage that is approximately 1.75 in (44.4 mm) (height) by 16 in (410 mm) (width) by 14 in (360 mm) (depth) and is approximately 40 in above final grade.
      ii. Provide telescoping guides to allow full extension from the rack cage.
      iii. Provide construction that supports a weight of 25 lb (11 kg) when extended.
      iv. Provide a minimum non-slip work area measuring 12 in (304 mm) by 12 in (304 mm).
   b. Types 2 and 3: Equip field cabinet with one cabinet-sliding internal shelf and drawer.
   c. Type 4: Equip field cabinet with two sliding internal shelves and drawers.

4. Document Pouch
   a. Provide a plastic documentation pouch that is side-opening, resealable, opaque, and of a heavy-duty plastic material to store the cabinet and equipment documentation.
   b. Provide a pouch that has metal or hard-plastic reinforced holes for hanging from hooks included on the field cabinet door.
   c. Provide a pouch that is of the size and strength to easily hold wiring diagrams, equipment documentation, and the maintenance logbook.
   d. Provide field cabinets with hooks, welded to the inside of the front cabinet door, for hanging the plastic documentation pouch.

5. Wiring, Conductors and Terminal Blocks
   a. Component Mounting Deutsche Industrie Norm (DIN) Rail
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i. Provide 1.38 in (35 mm) wide by 0.3 in (7.5 mm) high by 0.04 in (1 mm) thick standard DIN rails perforated and cut to length for flexible mounting of devices including switches with power supply, PoE injector, terminal blocks, circuit breakers, and surge protection devices.

ii. Provide DIN rail that is burr free with no sharp edges or deformation from the standard profile.

iii. Comply with IEC EN 50022 (NS35), IEC EN 60715, and DIN 46277.

iv. Provide nut, bolt, and start washers to mount to panel for low resistance electrical connection.

v. Provide an anti-corrosion paste to provide a solid and long lasting electrical connection between the DIN rail and the mounting panel.

b. Terminal Blocks

i. Use DIN terminal blocks with voltage and current ratings greater than the voltage and current ratings of the wires that are terminated on the blocks

ii. Terminate conductors on terminal blocks using insulated terminal lugs large enough to accommodate the conductor to be terminated.

iii. Terminate on field wiring terminal block screws using a terminal ring lug for termination when two or more conductors are terminated.

iv. Use metallic terminal block connection hardware and components that are non-ferrous copper or nickel/tin-plated copper alloy or equivalent.

v. Comply with the following colors listed for all supplied terminal blocks and wires.
   a) Black – Line
   b) White – Neutral
   c) Green or Green/Yellow – Ground

vi. Provide a ground terminal that is the same size and pitch as the power terminals and provides positive electrical and mechanical connection to the mounting rail.

vii. Provide the quantity of terminals as shown in the Contract documents.

viii. Service Entrance Terminal Blocks:
   a) Make the terminal block for the 120 VAC field cabinet service entrance (SE) a 10 mm single level screw type device.
   b) Provide a terminal block that accommodates #14 to #2 AWG wiring for terminating electrical inputs and outputs.

ix. Distribution Terminal Blocks:
   a) Make terminal blocks for distribution of 120 VAC (TB2) and ground located on the protected side of the power service panel assembly a 6 mm single level screw type device.
   b) Provide terminal block that accommodates #24-6 AWG wiring and provide in colors as specified herein.

c. Circuit Breakers

i. Provide enclosed, thermal magnetic molded case circuit breakers bolted to the panel of the types, sizes, and quantities listed in the Contract documents.

ii. Provide spare breaker space.
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iii. Provide two-pole (2P) breakers for 120/240 VAC and single-pole (1P) for 120 VAC single-phase operating voltages.

iv. Comply with UL 489 and NEMA AB-1 standard for molded-case circuit breakers.

v. Ensure that amperage rating of breakers is shown on the face of the breaker or handle.

vi. Provide circuit breakers that have a quick-make, quick-break over center toggle-type mechanism and a position between “ON” and “OFF” when tripped automatically.

vii. Provide circuit breakers that are 120 VAC rated with a minimum symmetrical interrupting short circuit capacity of 18,000A.

viii. Use only circuit breakers that are DIN rail mounted.

ix. Provide circuit breakers that are UL listed.

d. Fuses:

i. Provide DIN rail-mounted switch or disconnect type fuse holders and fuses for low voltage AC and DC circuits in the proper capacity and configured as required.

ii. Fuse size rating labeled on the holder or one the panel adjacent to the holder.

e. Spacer:

i. Provide spacers or dividers between terminal blocks and other components as shown in the Contract documents for visual separation.

ii. Ensure that spacers snap on to DIN rail be approximately 5 to 18 mm thick and match the size of the terminals they separate.

f. Safety Cover:

i. Provide safety covers on terminal blocks to prevent contact with exposed conductors or any metallic components. This cover will provide electrical and visual separation between terminal blocks and other rail-mounted devices.

ii. Ensure that covers are approximately 2 mm thick and sized to match the terminal blocks they protect or separate.

g. Internal Wiring

i. Provide wiring between terminal blocks and attached devices insulated and the proper size.

ii. Utilize #12 to #14 AWG, THHN-THWN, stranded, copper wiring for internal branch circuits.

iii. Use insulated green wire to connect the ground wire directly to the ground terminals.

iv. Do not “daisy chain” with the grounding wires of other devices including other surge protectors.

h. Ground Fault Interrupter (GFI) Service Outlet

i. Provide one duplex, NEMA 15A, 5-15R, GFI duplex receptacle (convenience service outlet) with ground-fault circuit interrupters, box, and cover plate able to be accessed after equipment is installed within the field cabinet.

ii. Provide a UL-listed receptacle meeting Federal Specification #WC596.

i. Ground Buss Bar: Provide a ground buss bar of copper alloy material compatible with copper wire and provide at least two positions where a No. 2 AWG stranded copper wire can be attached.

j. Grounding and Bonding: Provide grounding and bonding that complies with NEC requirements. Refer to Section 682 for detailed grounding and bonding requirements.
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k. End Brackets: Provide screw-clamped end brackets to positively lock all DIN rail-mounted devices to the rail.

6. Surge Protection
   a. Provide a Type 2 Surge Protection Device (SPD) for the cabinet’s main AC power input on the load side of the field cabinet circuit breaker. Other surge protection devices are covered under individual device specifications.
   b. Provide SPD that meets the following minimum performance requirements:
      i. Posted at UL.com under certification with 20KA I-nominal rating.
      ii. Provide a performance that equals or exceeds 100KA per phase, less than 1nSec response time, and with a maximum protection rating of 600V for L-G and L-N and 1,000V for L-L modes of protection.
      iii. Provide a SCCR that equals or exceeds 100KA.
      iv. Provide a UL Voltage Protection Rating (VPR) per L-N mode of 800V or lower.
   c. Provide SPD that has no leakage current to ground.
   d. Include directly connected thermally protected MOVs.
   e. Provide pluggable SPD modules.
   f. Comply with UL 1449 4th edition, Open-Type 1 Listed.
   g. Comply with IEEE C62.45, C62.41.1, and C62.41.2 rated for NEMA TS2 temperature and humidity requirements.
   h. Provide solid-state bi-directional operation.
   i. Provide SPD that can be DIN rail mounted.
   j. Provide SPDs that are equipped with visual and remote status indication and with an audible alarm.

7. Rack-Mounted Power Strip
   a. Provide a maximum rating of 15A, 120 VAC, 60 Hz.
   b. Provide minimum of eight NEMA 5-15R receptacles or as specified in the Contract documents.
   c. Provide spacing to accommodate a minimum of four plug-in power supplies without covering up remaining outlets.
   d. Mount the power strip on the rear near the top of the standard TIA-310-D rack cage. Mount the power strip facing toward the back of the field cabinet providing a minimum spacing of 3 in (76 mm) between the outlet's face and the field cabinet door when the door is closed.
   e. Provide power strip that does not hinder accessibility to the back of existing electrical equipment.
   f. Provide power strip with integrated surge protection meeting the following minimum requirements:
      i. Provide power strip that is UL 1449 listed.
      ii. Exceed IEEE 587 Category A and B specifications.
      iii. Provide a minimum UL 1449 let-through voltage rating of less than 330V(RMS).
      iv. Provide a minimum AC suppression joule rating of 600 joules.
      v. Provide an AC suppression surge current rating of 20,000A.
      vi. Provide a minimum UL 1283 EMI/RFI noise filtering protection rating of 40 dB.
      vii. Provide LED status indicators.
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8. Interior Lighting
   a. Provide LED lights at the front and back of the field cabinet.
   b. Equip the LED lights with a manual on/off switch that is connected to a door switch that allows the lights to be powered when the field cabinet door is open.

9. Environmental Systems: For vented cabinet types provide the following ventilation system:
   a. Temperature
      i. Provide a thermostatically controlled ventilation blower fan(s) to maintain internal temperatures below the upper operating temperature thresholds for installed equipment and components that are operating continuously at full capacity.
      ii. Provide the capability for the user-set temperature thresholds to automatically activate the fan(s) to turn on or off when the internal field cabinet temperature exceeds the threshold.
   b. Ventilation System
      i. Provide a design so that openings prevent the entrance of dust, insects, and other foreign matter.
      ii. Provide a bottom trough to drain any accumulated moisture to the outside of the field cabinet.
      iii. Type 1: Provide one 100 cubic feet per minute (cfm) (minimum) 120 VAC blower exhaust fan mounted near the top of the field cabinet.
      iv. Types 2, 3 and 4: Provide two 100 cfm (minimum) 120 VAC blower exhaust fans mounted near the top of the field cabinet.

10. Cable and Wire Management
    a. Provide vertical and horizontal cable management as shown in the Contract documents or as approved by the Department.
    b. Provide cable and wire management for AC branch, low-voltage power, and communications/data wiring within the field cabinet.
    c. Provide cable and wire management components securely attached to the field cabinet/rack cage with screws; no adhesive or self-stick mounting is acceptable.
    d. Provide separate wire management for power and other field cabinet low-voltage and communications wiring.
    e. Type 4 cabinet only: Provide a minimum of four wiring pass-through holes on the inside side-mounting panels to permit patch cords to pass between the two cabinet sides:
       i. Provide 5 in (127 mm) pass-through holes that are fully grommeted for patch cord protection, with the holes positioned with two in the cabinet front and two in the cabinet rear and aligning horizontally between the two side panels.
       ii. Provide plastic- or rubber-coated J-hooks or D-rings, minimum 1 in (25 mm) depth and height, on the inside rails of the rack cabinet cages, to organize patch cords passing between the two cabinet sides.

939.2.9 Reserved

939.2.10 Field UPS Requirements
    1. Provide an industrial-grade UPS that is a double-conversion, on-line type.
    2. Comply with UL 1778 standard.
    3. Provide one or more of the field UPS types listed in Table 4:
4. Provide UPS that is capable of operating over minimum input voltage range of 80 VAC to 138 VAC at 50/60 Hz (±5%, maximum).

5. Ensure that the UPS outputs a pure sine wave at 120 VAC ±3% at 50/60 (±0.3% maximum).

6. Provide a Total Harmonic Distortion (THD) of <3% (resistive load).

7. Provide a minimum of four output receptacles type NEMA5-15R.

8. Provide a UPS with a minimum of 85% efficiency (AC-to-AC).

9. Support a minimum transfer time of 0 ms for line fails/recovers, and 5 ms or less for UPS to bypass and reverse.

10. Battery System
    a. Provide maintenance-free sealed batteries that can be serviced and replaced separately from the UPS.
    b. Provide batteries that are rated for extreme temperatures that have been field proven and tested.
    c. Provide UPS batteries that maintain 80% of original capacity for a minimum of five years.
    d. Provide a maximum battery recharge time of 8 hours to 90% of full charge.
    e. Provide battery charger capability that provides a minimum of three-stage, temperature compensated charging and keeps the batteries above a minimum depth of discharge point of 50% or as recommended by the manufacturer.
    f. Provide user-replaceable and hot-swappable battery packs.
    g. Provide batteries with non-conductive terminal covers.

12. Size the battery bank to meet the following minimum runtimes:
    a. Type 1 and 2 field UPS: Provide a minimum runtime of one hour under full load as shown in Table 4.
    b. Hub UPS only: Provide a minimum runtime of four hours under full load as shown in Table 4.
    c. Provide the capability to be expanded for increased runtime using additional expansion battery banks or packs.

13. Provide UPS that supports local and remote monitoring and control via RS232 port and Ethernet SNMP interface:
    a. Provide an addressable SNMP command set including, at a minimum, UPS state, battery condition (capacity, age, internal temperature); current AC input conditions (voltage, phase, frequency, failure condition); current AC output conditions (voltage, frequency, load); and diagnostic/self-test control and status.
    b. Provide remote environmental sensing hardware and software integrated with SNMP minimally capable of temperature and humidity monitoring including generating alarms for Low Battery, Over/Under Voltage, Over/Under Frequency, and High Temperature.
    c. Provide UPS with LCD display for monitoring unit.
    d. Provide four dry contact closures.
    e. Provide support for adjustable high and low voltage buck/boost function.
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f. Provide a UPS with automatic low-battery and high temperature shutdown features.
g. Ensure the UPS will return to normal operations without a manual reset.

14. Provide UPS with a maximum audible noise of <50 dBA at 3 ft (0.9 m).

15. Provide UPS with battery bank(s) that mount on an EIA 19 in (483 mm) rack using a maximum space of five rack units.

16. **Environmental Requirements**: Provide a UPS system including battery bank that meets following minimum requirements:
   a. Types 1 and 2 field UPS: Ambient temperature range from −4°F through +131°F (−20 °C through +55°C).
   b. Hub UPS: Ambient temperature range from +32°F through +104°F (0°C through +40°C).
   c. Relative humidity from 10% through 95%, noncondensing.

### 939.2.11 Solar Power System Requirements

**A. General Requirements**

1. Provide a solar system that can be mounted in a permanent configuration or in a temporary portable type configuration.

2. Provide one or more of the solar power system types listed in Table 5 as specified in the Contract documents:

<table>
<thead>
<tr>
<th>Type</th>
<th>Location</th>
<th>Site Output Power Capacity (minimum, full load)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type 1</td>
<td>Field Cabinet</td>
<td>350 watts</td>
</tr>
<tr>
<td>Type 2</td>
<td>Field Cabinet</td>
<td>800 watts</td>
</tr>
</tbody>
</table>

3. Provide DC-to-DC and DC-to-AC conversion equipment, as specified herein.

**B. Solar Panel Requirements**

1. Provide high-efficiency, photovoltaic solar panel(s) made from tempered glass with an anodized aluminum frame, sized to provide full charging of batteries within a one day full sunlight cycle while under operation in December.

2. Provide solar panels that deliver power for the equipment at the site such that it operates using the lowest average winter insolation values for the area in which the system is installed, accounting for system inefficiencies.

3. Provide IP67-rated junction boxes as required on the backside of the panel.

4. Provide bypass diodes to minimize power drop caused by shade and provide better performance in low-light conditions.

**C. Solar Battery Requirements**

1. Provide batteries that are individually replaceable (hot-swappable), completely sealed, and maintenance free, requiring no watering.

2. Provide battery capacity (amp-hours) and type that will keep field cabinet equipment operating for a minimum of 72 hours without sunlight or charging of the batteries. Include a 20% safety factor to ensure operation in unseasonable weather conditions and battery degradation over time.

3. Provide solar batteries that maintain 80% of original capacity for a minimum of five years.
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4. Provide solar batteries with non-conductive terminal covers.

D. Solar Charge Controller Requirements

1. Provide a minimum 30A rated Pulse Width Modulation (PWM) charge controller that charges 12, 24, and 48V batteries.
2. Provide a charge controller that supports the selected battery type.
3. Provide a charge controller with built-in energy LCD monitor to track and indicate the state of charge, voltage level of the solar batteries, and output of the solar panels.
4. Provide a charge controller that keeps the solar batteries above the minimum depth of discharge point of 50% or as recommended by the battery manufacturer.
5. Provide a charge controller with data logging capabilities that can be viewed over the network.
6. Provide a charge controller that disconnects the equipment from the solar batteries at a variable percentage load and allows the batteries to reach a higher state of charge, commonly referred to as a low voltage disconnect feature.

E. Solar Power Inverter Requirements

1. Provide a power inverter that outputs a true sine wave DC to 120 VAC ±5% rated for off-grid solar application.
2. Provide power inverter that meets the continuous power wattage (total load capacity) requirements of the ITS field cabinet equipment and components.
3. Provide a minimum surge rating that is double the continuous power wattage calculation to support equipment start-up power needs (peak power).
4. Provide a power inverter with a power factor of 0.9 to 1.0.
5. Provide power inverter with a minimum 3 x NEMA 5-15R, 15A outlet receptacles.

F. Environmental Requirements

Provide solar panels, charge controller, inverter and battery bank that meets following minimum temperature and humidity requirements:

1. Ambient temperature range from −4°F through +131°F (−20°C through +55°C).
2. Relative humidity from 10% through 95%, noncondensing.

939.2.12 Field Power Controller Requirements

1. Provide a field power controller that is IP-addressable (static) and accessible over a network.
2. Provide a 10/100 autosensing, port selectable, RJ-45 Ethernet interface.
3. Provide capability for rebooting and control of outlet receptacles in remote locations from a web browser.
4. Provide secure control through a user web interface, including SSL and multi-user password secure access.
5. Provide a minimum of 18 x NEMA 5-15R, 15A outlet receptacles with eight switched pairs and two unswitched receptacles.
6. Provide an automatic ping feature that monitors and automatically reboots if locked up devices.
7. Provide a minimum surge protection using dual 3,600J metal oxide varistors (MOV) to clamp power surges and spikes.
8. Provide configurable event data logging.
9. Provide field power controller that mounts on an EIA 19 in (483 mm) rack (maximum space of two rack units) inside a standard ITS field cabinet or hub building rack.

10. **Environmental Requirements**: Provide a field power controller that meets the following minimum requirements:
   a. Provide field power controller including power supply that comply with NEMA TS 2 Sections 2.1.7, 2.1.8, and 2.1.9 temperature, humidity, vibration, and shock testing requirements.
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939.3 Construction

Ensure that construction and installation of the equipment, materials, components, and assemblies specified in this section comply with the manufacturer’s requirements and recommendations.

939.3.1 Contractor Experience and Qualifications

Provide a minimum of three current client references for projects that were performed by the Contractor and/or sub-contractor for the installation, integration, and testing of Ethernet network switches (Layer 2 and Layer 3), field cabinets and components, UPS and battery systems, and solar power systems. The systems must have been in continuous service for at least two years.

939.3.2 Construction Requirements

A. General Installation Requirements

1. Install network switches, field cabinets and components, UPS and battery systems, and solar power components as required by the Contract documents and recommended by the manufacturer.

2. Install equipment in new and/or existing rack space in accordance with the equipment manufacturer’s recommendations, including mounting, interconnection wiring, and electrical service.

3. Furnish and install mounting hardware and incidental materials, including fasteners and auxiliary supporting frames/brackets, as recommended by the manufacturer.

4. Furnish and install miscellaneous hardware, materials, wiring/cabling, configuration, and any other incidental items necessary for fully operational components and subsystems shown in the Contract documents and Section 940, except when specifically identified as existing or as work to be performed by the Department.

5. Work on this Project may require access to various Department buildings, hub buildings, and field cabinets requiring coordination of all work activities in these locations with the Department 10 days before access is needed.

6. Work on this Project requires system configuration and integration tasks to be performed by the Department before some Contractor-installed items can be brought online and completely system tested. Coordinate all work activities needing system configuration with the Department a minimum of 14 days prior to any testing.

7. Provide properly sized electrical service, including grounding and current rating, in the equipment racks for all hardware installed under this Project. Furnish and install additional power outlet strips in new and existing equipment racks if needed for the new equipment.

8. For any equipment that is not rack mountable with “rack ears,” provide perforated shelves and secure shelf-mounted equipment with rack mounting hardware.

9. Protect cable ends at all times with acceptable end caps. Never subject any cable to exceed its minimum bend radius as recommended by the manufacturer.

10. Terminate ground wiring between cabinet surge protectors on the DIN rail-mounted ground terminal blocks.

11. Dress and route grounding wires separately from all other field cabinet wiring.

12. Install grounding wires with the absolute minimum length possible between the surge protector and the ground terminals.

13. Provide grommets, guides, and/or strain relief material where necessary to avoid abrasion of or excess tension on wire and cable.

14. Neatly route, dress, and secure patch cords in the equipment racks and at both ends. Use all available cable management devices and/or trays. Route patch cords only vertically on the sides of the equipment racks or horizontally across the bottom or top of the racks; no diagonal routing is permitted. Follow manufacturer’s recommendations including bend radius requirements during patch cord installation.
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15. Store uninstalled cable according to manufacturer recommended bend radius and cable reel requirements.

16. Inspect and test cable for continuity when received, with results compared with factory pre-shipping tests.

17. Inspect the cable nomenclature to make certain that the correct product has been received. Notify the supplier (or manufacturer) of discrepancies for immediate correction.

B. Communications Subsystem

1. Install communications network equipment and materials necessary for a complete communications path from the field site to the TMC or communications hub as shown in the Contract documents.

2. Furnish and install mounting and interconnection materials, including but not limited to mounting panels and rack hardware, fiber and Cat-6 patch/jumper cables, surge protection, and power supply cables.

3. Mount field equipment in a manner as to not restrict the replacement of other components in the field cabinet housing or hub building.

C. Uninterruptible Power Supply

1. Install UPS and battery bank or pack in the field cabinet rack and hub equipment rack.

2. Furnish and install a dedicated electrical service branch circuit from the hub main service panel for the UPS system.

3. Ensure that the UPS system branch circuit is in accordance with all recommendation of the UPS manufacturer, including the provision of a locking plug/receptacle connection.

4. Locate the branch circuit receptacle as close as possible to the UPS mounting position to minimize the UPS input line cord and to minimize tripping hazards.

5. Configure the electrical service inputs for network switches and other equipment to be supplied by the UPS.

6. Furnish and install line cords, power strips, and incidental materials to configure the UPS service to the above equipment.

D. Solar Power System

1. Install and mount the solar panel(s) with mounting bracket and the field cabinet on the ITS pole or structure at heights specified in the Contract documents or as directed by the Department.

2. The installation locations of poles and structures may require slight adjustments to maximize sun exposure for the solar panel assembly. Obtain approval of final site location and orientation from the Department prior to installation.

3. Install in accordance with the manufacturer’s recommended installation procedures and the Contract documents.

4. Mount and orient the solar panel(s) to maximize sun exposure in accordance with the manufacturer’s recommendations.

5. Mount panels at an angle to enable runoff of rain and snow.

6. Provide power from the solar power assembly to the controller cabinet by connecting to the UPS in the cabinet.

7. Ensure no wires from the solar panel(s) to the battery and from the battery to the charge controller are exposed.

8. Install wires in liquid tight flexible conduit, run inside a pole, or other method approved by the Department. The cost to furnish and install any conduit for the solar power assembly installation shall be included in the cost of the solar power assembly.

9. Electrically ground the solar power assembly in accordance with manufacturer recommendations.
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E. Patch Cables and Labeling

1. Label wiring and cabling, including entrance cables, jumper and patch cords, and power supply cables. Cable labels shall consist of UV-protected, waterproof permanent ink printed or legibly written on self-laminating and over-wrapping label material.

2. Apply cable labels at each end and in the center of the cable. Cable labels shall consist of permanent ink printed or legibly written on self-laminating and over-wrapping label material.

3. Label patch cords using cable identification numbers shown in the Contract documents or provided by the Department.

4. Apply cable labels at each end and in the center of the cable.

5. Use printer-generated adhesive overlapping cable labels.

939.3.3 Equipment Configuration and Integration Requirements
Refer to Section 940.2.03 for network equipment configuration and integration requirements.

939.3.4 Testing Requirements
Refer to Section 940.2.04 for testing requirements.

939.3.5 Training Requirements
Refer to Section 940.2.05 for training requirements.

939.3.6 Warranty and Maintenance Support Services

A. Warranty Requirements

1. Ensure that the network equipment, field cabinets and components, UPS battery back-up systems, solar equipment, surge protection, communication cables, and associated components defined herein furnished, assembled, and installed have a manufacturer’s warranty (usual and customary) covering defects in assembly, fabrication, and materials. Include in warranty and support, all contractor or manufacturer activities related to maintenance, removal, and replacement of parts and materials during the period of support.

2. Provide a minimum warranty length as follows:
   a. Network Field Switch: minimum of five years.
   b. Network Routing Switch: minimum of five years.
   c. Surge Protectors: minimum of five years.
   d. UPS and Battery System: minimum of three years.
   e. All other equipment and materials furnished and installed as part of this section: minimum of two years.

3. If the manufacturer’s warranties for the components are for a longer period, those longer period warranties shall apply.

4. Ensure warranty periods begin on the date of maintenance acceptance by the Department.

5. Ensure that the manufacturer’s warranties are continuous throughout the period and shall be fully transferable from the Contractor to the Department and any maintenance consultant/contractor.

6. Provide maintenance support services and make any replacements required during the warranty period without additional charge for labor, equipment, parts, shipping, and other materials required. Support all system components notwithstanding any supplier’s warranties whether written or implied.
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B. Maintenance Support Services:

Refer to Section 940.2.06 for maintenance support services requirements.

939.3.7 Project Close-Out Requirements

Refer to Section 940.2.07 for project close-out requirements.

939.4 Measurement

The network equipment, field cabinets and components, UPS battery back-up systems, solar equipment, surge protection, and communication cables defined herein and training complete, in place, accepted, and of the kind, size, and type specified is measured as follows:

A. Network Field Switch

Item 939-2300 -- FIELD SWITCH, TYPE A (EA)
Item 939-2301 -- FIELD SWITCH, TYPE B (EA)
Item 939-2305 -- FIELD SWITCH, TYPE C (EA)
Item 939-2310 -- FIELD SWITCH, TYPE D (EA)
Item 939-2315 -- FIELD SWITCH, TYPE E (EA)

Network field switches (all types) with mounting hardware will be measured for payment by the number installed, complete, functional, and accepted. This price will be full compensation for labor, tools, materials, equipment, and incidentals necessary to complete the work.

B. SFP Fiber Module

Item 939-2390 – SFP FIBER MODULE, TYPE 1 (EA)
Item 939-2391 – SFP FIBER MODULE, TYPE 2 (EA)

SFPs (all types) are measured for payment by the number installed, complete, functional, and accepted.

C. Network Routing Switch

Item 939-2401 -- ROUTING SWITCH, Hub, TYPE A (EA)
Item 939-2402 -- ROUTING SWITCH, Hub, TYPE B (EA)

Network routing switches (all types) with mounting hardware will be measured for payment by the number installed, complete, functional, and accepted. This price will be full compensation for labor, tools, materials, equipment, and incidentals necessary to complete the work.

D. Field Cabinet

Item 939-4101 -- FIELD CABINET, TYPE 1 (EA)
Item 939-4110 -- FIELD CABINET, TYPE 2 (EA)
Item 939-4120 -- FIELD CABINET, TYPE 3 (EA)
Item 939-4130 -- FIELD CABINET, TYPE 4 (EA)

E. Solar Power System

Item No. 939-4201 – SOLAR POWER SYSTEM, TYPE 1 (EA)
Item No. 939-4202 – SOLAR POWER SYSTEM, TYPE 2 (EA)
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F. Field UPS
   Item 939-6000 – HUB UPS (EA)
   Item 939-6050 – FIELD UPS, TYPE 1 (EA)
   Item 939-6060 – FIELD UPS, TYPE 2 (EA)

G. Field Power Controller
   Item 939-6100 – FIELD POWER CONTROLLER (EA)

H. Training
   Item 939-8500 – TRAINING (LS)
   Training is measured as a lump sum for supplies, equipment, materials, handouts, travel, and subsistence necessary to conduct the training.

Measurement Notes:

Submittal

Submittal requirements are included in Section 940 and shall not be paid for separately and shall be considered incidental to the different communications and electronic equipment specified in this section.

Testing

Testing requirements are included in Section 940 and shall not be paid for separately and shall be considered incidental to the communications and electronic equipment specified in this section.

NaviGAtor Integration

NaviGAtor integration requirements are included in Section 940 and shall be paid for under 940-1000.

939.5 Payment

Communications and electronic equipment of the type specified in the Contract documents are paid for at the Contract Unit Price. Payment is full compensation for furnishing and installing or delivering the communications and electronic equipment.

The Department will pay 25% of the total Contract bid amount for properly stored materials. The Department will pay 50% of the total Contract bid amount upon installation of the communications and electronic equipment and completion of the stand-alone/site testing acceptance. The Department will pay 25% of the total Contract bid amount upon completion of the Final Project Acceptance. The total sum of all payments cannot exceed the original Contract amount for this item.

Payment for communications and electronic equipment is made under:

<table>
<thead>
<tr>
<th>Item No. 939</th>
<th>Field Switch, Type A</th>
<th>Per each</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item No. 939</td>
<td>Field Switch, Type B</td>
<td>Per each</td>
</tr>
<tr>
<td>Item No. 939</td>
<td>Field Switch, Type C</td>
<td>Per each</td>
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<tr>
<td>Item No. 939</td>
<td>Field Switch, Type D</td>
<td>Per each</td>
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<tr>
<td>Item No. 939</td>
<td>Field Switch, Type E</td>
<td>Per each</td>
</tr>
<tr>
<td>Item No. 939</td>
<td>SFP Fiber Module, Type 1</td>
<td>Per each</td>
</tr>
<tr>
<td>Item No. 939</td>
<td>SFP Fiber Module, Type 2</td>
<td>Per each</td>
</tr>
<tr>
<td>Item No. 939</td>
<td>Routing Switch, Hub, Type A</td>
<td>Per each</td>
</tr>
<tr>
<td>Item No. 939</td>
<td>Routing Switch, Hub, Type B</td>
<td>Per each</td>
</tr>
<tr>
<td>Item No. 939</td>
<td>Field Cabinet, Type 1</td>
<td>Per each</td>
</tr>
<tr>
<td>Item No. 939</td>
<td>Field Cabinet, Type 2</td>
<td>Per each</td>
</tr>
<tr>
<td>Item No. 939</td>
<td>Field Cabinet, Type 3</td>
<td>Per each</td>
</tr>
<tr>
<td>Item No. 939</td>
<td>Field Cabinet, Type 4</td>
<td>Per each</td>
</tr>
</tbody>
</table>
**Section 939—Communications and Electronic Equipment**

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Description</th>
<th>Per each</th>
</tr>
</thead>
<tbody>
<tr>
<td>939</td>
<td>Solar Power System, Type 1</td>
<td></td>
</tr>
<tr>
<td>939</td>
<td>Solar Power System, Type 2</td>
<td></td>
</tr>
<tr>
<td>939</td>
<td>Hub UPS</td>
<td></td>
</tr>
<tr>
<td>939</td>
<td>Field UPS, Type 1</td>
<td></td>
</tr>
<tr>
<td>939</td>
<td>Field UPS, Type 2</td>
<td></td>
</tr>
<tr>
<td>939</td>
<td>Field Power Controller</td>
<td></td>
</tr>
</tbody>
</table>

**694.5.02 Training**

The Department will pay 25% of the total Contract bid amount for training upon approval of the Training Plan. The Department will pay the remaining 75% after completion of training described in Section 940.2.05. The total sum of all payments cannot exceed the original Contract amount for this item.

Payment for training is made under:

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Description</th>
<th>Lump Sum</th>
</tr>
</thead>
<tbody>
<tr>
<td>939</td>
<td>Training</td>
<td></td>
</tr>
</tbody>
</table>
Surge Protection Systems and Devices
Attachment 17-4

Surge Protection Systems and Devices

Section 17-1 Surge Protection Systems and Devices

17-1.1 General Description

This work consists of furnishing materials and installation of Surge Protection Devices for traffic signal and intelligent transportation system implementation.

It also includes all test periods, warranties and guarantees as designated in subsequent sections, and response to maintenance and operational issues as described in subsequent sections.

17-1.1.01 Definitions

General Provisions 101 through 150.

17-1.1.02 Related References

A. Standard Specifications

Section 106—Control of Materials
Section 500—Concrete Structures
Section 501—Steel Structures
Section 631—Changeable Message Signs
Section 636—Highway Signs
Section 639—Strain Poles for Overhead Sign and Signal Assemblies
Section 680—Highway Lighting
Section 681—Lighting Standards and Luminaires
Section 682—Electrical Wire, Cable, and Conduit
Section 915—Mast Arm Assemblies
Section 923—Electrical Conduit
Section 925—Traffic Signal Equipment
Section 935—Fiber Optic System
Section 936—CCTV System
Section 937—Video Detection System
Section 938—Radar Detection System
Section 939—Communications & Electronic Equipment
Section 940—Navigator Integration

B. Referenced Documents

National Electrical Manufacturers Association (NEMA) Traffic Control Systems Standards No. TS 1
NEMA Traffic Control Systems Standards No. TS 2
AASHTO Roadside Design Guide
The Manual on Uniform Traffic Control Devices (MUTCD), current edition
National Electrical Code (NEC)
UL 467, Grounding and Bonding Equipment;  
UL 497A, Standard for Secondary Protectors for Communications Circuits;  
UL 497B, Standard for Protectors for Data Communications and Fire-Alarm Circuits;  
UL 497C, Standard for Protectors for Coaxial Communications Circuits;  
UL 752, Standard for Bullet-Resisting Equipment;  
UL1008, Standard for Transfer Switch Equipment;  
UL 1449, Standard for Surge Protective Devices; and the NEC.  
Ensure that lightning protection systems conform to the requirements of NFPA 780, Standard for the Installation of Lightning Protection Systems.

GDT 7  
GDT 24a  
GDT 24b  
GDT 67

17-1.1.03 Submittals

Submit to the Engineer, SPD material specifications information on all materials proposed for use on the project. The Engineer will forward the materials submissions to the District Traffic Operations offices, which will forward the information onto the Traffic Operations offices at the TMC building.

A. Review

For all submittals, the State Traffic Signal Design Engineer's review of the material should be completed within thirty (30) days from the date of receipt of the submission unless otherwise specified. The State traffic Signal Design Engineer will advise in writing, as to the acceptability of the material submitted.  

All material submittals for equipment and materials used on the project will be reviewed by the Department's Traffic Signal Electrical Facility (TSEF). The material review should be completed within thirty (30) days from the date of receipt of the material submission unless otherwise specified. The State Traffic Signal Engineer will advise in writing as to acceptability of materials to be used on the project.  

The State Traffic Signal Design Engineer may determine that the item is approved, in which case no further action is required; or the item may be partially or totally rejected in which case, modify the submittal as required and resubmit within fifteen (15) days. At this time, the review and approval cycle described above begins again.

B. Submittal Costs

Include the costs of submittals within the price paid for individual bid items. No additional compensation will be made.

17-1.2 Materials

17-1.2.01 General

Furnish and install grounding and Surge Protective Devices (SPDs) for all ITS devices to protect the devices from lightning, transient voltage surges, and induced current. Use only new materials meeting the requirements of this section. Use equipment or materials that have been tested and approved for the specific use intended by a NRTL, recognized by the Occupational Safety and Health Administration, in accordance with 29 CFR 1910.7 and that also meet the following requirements.

Install SPDs on all power, data, video and any other conductive circuit. Use only equipment and components that meet the minimum requirements of this specification. All SPD shall operate as specified during and after being subjected to the transients, temperature, voltage, humidity, vibration, and shock tests described in National Electrical Manufacturers Association (NEMA) TS2, 2.2.7, 2.2.8, and 2.2.9.
A. Temperature and Humidity:

Equipment shall operate as specified when the ambient temperature and humidity are within the following specified limits:

- The operating ambient temperature range shall be from -30° to 165°F (-34.4° to 73.8°C).
- The storage temperature range shall be from -50° to 185°F (-45.5° to 85°C).
- The relative humidity shall not exceed 95 percent, non-condensing

B. Vibration:

The equipment shall operate as specified and maintain its physical integrity when subjected to a vibration of 5 to 30 Hz up to 0.5 gravity applied in each of three mutually perpendicular planes.

C. Shock:

The equipment shall suffer neither permanent mechanical deformation nor any change that renders the unit inoperable when subjected to a shock of 10 gravities applied in each of three mutually perpendicular planes.

17-1.2.01 Installation:

Provide all ITS field installation sites with both primary and secondary surge protection on the AC power. Connect the primary surge protection at the service entrance or main disconnect. Connect the secondary surge protection on the power distribution to the equipment.

A. SPD at Power Entry Point:

Install a SPD at the closest termination/disconnection point where the supply circuit enters the ITS device cabinet. Locate the SPD on the load side of the main disconnect and ahead of any and all ITS electronic devices. Configure the SPD to operate at 120 volt single phase (i.e., line, neutral and ground) or 120/240 volt single phase (line 1, line 2, neutral and ground) as required to match the supply circuit configuration. Ensure that the SPD maximum surge current rating is 80kA per phase or greater. Verify that the SPD has been labeled to indicate that the unit is UL listed and meets the requirements of UL 1449, Third Edition.

Ensure that the SPD has a visual indication system that monitors the weakest link in each mode and shows normal operation or failure status and also provides one set of normally open (NO)/normally closed (NC) Form C contacts for remote alarm monitoring. The enclosure for a SPD shall have a NEMA 4 rating.

B. SPD at Point of Use:

Install a SPD at the point the ITS devices receive 120 volt power. Ensure that the units are rated at 15 or 20 amps load and a minimum of 20kA of surge current capacity and configured with receptacles.

Ensure that these units have internal fuse protection and provide common mode (L+N-G) protection.

C. SPD for Low-Voltage Power, Control, Data and Signal Systems:

Install a specialized SPD on all conductive circuits including, but not limited to, data communication cables, coaxial video cables, and low-voltage power cables. Ensure that these devices comply with the functional requirements shown in Table 785-1 for all available modes (i.e. power L,N, N-G; L,G; data and signal center pin-to-shield, L-L, L-G, and shield-G where appropriate).

<table>
<thead>
<tr>
<th>Circuit Description</th>
<th>Clamping Voltage</th>
<th>Data Rate</th>
<th>Surge Capacity</th>
<th>Maximum Let-Through Voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 VDC</td>
<td>15-20 V</td>
<td>N/A</td>
<td>5kA per mode (8x20 μs)</td>
<td>&lt;150 Vpk</td>
</tr>
<tr>
<td>24 VAC</td>
<td>30-55 V</td>
<td>N/A</td>
<td>5kA per mode (8x20 μs)</td>
<td>&lt;175 Vpk</td>
</tr>
<tr>
<td>48 VDC</td>
<td>60-85 V</td>
<td>N/A</td>
<td>5kA per mode (8x20 μs)</td>
<td>&lt;200 Vpk</td>
</tr>
<tr>
<td>Circuit Description</td>
<td>Clamping Voltage</td>
<td>Data Rate</td>
<td>Surge Capacity</td>
<td>Maximum Let-Through Voltage</td>
</tr>
<tr>
<td>------------------------</td>
<td>------------------</td>
<td>----------------</td>
<td>-------------------------------</td>
<td>-----------------------------</td>
</tr>
<tr>
<td>120 VAC at POU</td>
<td>150-200 V</td>
<td>N/A</td>
<td>20kA per mode (8x20 μs)</td>
<td>&lt;550 Vpk</td>
</tr>
<tr>
<td>Coaxial Composite Video</td>
<td>4-8 V</td>
<td>N/A</td>
<td>10kA per mode (8x20 μs)</td>
<td>&lt;30 Vpk</td>
</tr>
<tr>
<td>RS422/RS485</td>
<td>8-15 V</td>
<td>Up to 10 Mbps</td>
<td>10kA per mode (8x20 μs)</td>
<td>&lt;30 Vpk</td>
</tr>
<tr>
<td>T1</td>
<td>13-30 V</td>
<td>Up to 10 Mbps</td>
<td>10kA per mode (8x20 μs)</td>
<td>&lt;30 Vpk</td>
</tr>
<tr>
<td>Ethernet Data</td>
<td>7-12 V</td>
<td>Up to 1 Gbps</td>
<td>1kA per mode (10x1000 μs)</td>
<td>&lt;30 Vpk</td>
</tr>
</tbody>
</table>

### SPD Minimum Requirements

<table>
<thead>
<tr>
<th>Circuit Description</th>
<th>Clamping Voltage</th>
<th>Data Rate</th>
<th>Surge Capacity</th>
<th>Maximum Let-Through Voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td>120 VAC at POU</td>
<td>150-200 V</td>
<td>N/A</td>
<td>20kA per mode (8x20 μs)</td>
<td>&lt;550 Vpk</td>
</tr>
<tr>
<td>Coaxial Composite Video</td>
<td>4-8 V</td>
<td>N/A</td>
<td>10kA per mode (8x20 μs)</td>
<td>&lt;30 Vpk</td>
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<td>RS422/RS485</td>
<td>8-15 V</td>
<td>Up to 10 Mbps</td>
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<td>13-30 V</td>
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<td>7-12 V</td>
<td>Up to 1 Gbps</td>
<td>1kA per mode (10x1000 μs)</td>
<td>&lt;30 Vpk</td>
</tr>
</tbody>
</table>

#### 17-1.2.01 Warranty for Surge Protective Devices:

Provide a SPD that is warranted by its manufacturer against any failures caused by electrical events, including direct lightning strikes, for a period of not less than 10 years or the SPD device manufacturer’s standard warranty period, whichever is greater.

The term “failure” for warranty replacement is defined as follows:

- Parallel-connected, power-rated SPD units are considered in failure mode when any of the visual indicators shows failure mode when power is applied to the terminals at the unit’s rated voltage, or the properly functioning over-current protective device will not reset after tripping.
- Series-connected, low-voltage power, data, or signal units are considered in the failure mode when an open circuit condition is created and no data/signal will pass through the SPD device or a signal lead is permanently connected to ground.

In the event that the SPD, including any component of the unit, should fail during the warranty period, the entire SPD shall be replaced by the manufacturer at no cost to the Department. Costs relating to the removal of the SPD, shipping and handling, and the reinstallation of the SPD shall be paid by the Department.
Georgia Department of Transportation

VOLUME 3

Programmatic Technical Provisions
For
Design-Build Agreement
P.I. No. 210327-

I-20 at Savannah River Bridge Replacements and Roadway Widening Project
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1 GENERAL

1.1 Project Design
Refer to Volume 2.

1.2 Project Scope
Refer to Volume 2.

1.2.1 Design and Construction Requirements
The DB Team shall design and construct the Project to comply with the requirements of the DB Documents.

The DB Team shall coordinate with GDOT and adjacent Governmental Entities and other third parties as appropriate to determine the design criteria, standards, and specifications of those components of Work that the DB Team will construct but are to be maintained by others. For components of Work that potentially or actually impact the infrastructure of any Governmental Entity or third-party entity, the DB Team’s design shall conform to the design requirements of such entity.

1.3 Transitions to Adjacent Infrastructure, Roadways and Facilities
Design and construct Project transitions and interconnections with adjacent infrastructure, roadway, and facilities and related appurtenances to be compatible and uniform at all interfaces. The DB Team shall coordinate with Persons, including other contractors, performing Work at or adjacent to the Site to provide seamless transitions from the Project to any work proposed, being developed, or existing. The DB Team shall remove any temporary transitions that are not intended to accommodate permanent traffic operations connecting the proposed improvements to existing roadways and shall restore all areas within the Work or impacted by the Work. The DB Team shall minimize disruption to traffic operations and adjacent property access throughout the performance of the Work.
2 PROJECT MANAGEMENT

2.1 General Requirements

2.1.1 Management Organization and Personnel
The DB Team shall establish and maintain an organization that effectively manages all Elements of the Work. This project management effort shall be defined by and follow the Project Management Plan (PMP), which is a collection of several management plans describing discrete Elements of the Work. The PMP is an umbrella document that describes the DB Team’s managerial approach, strategy, and quality procedures to design and build the Project and to achieve all requirements of the DB Documents.

2.1.1.1 DBE Manager
Refer to Volume 2.

2.1.2 Partnering
Refer to Volume 2.

2.1.3 Project Communications

2.1.3.1 Media and Public Information
A critical objective for all projects is to maintain the trust, support, and confidence of the media and public throughout the life of the Project. In order to meet this objective, it will be critical to proactively manage messages and communications to the media. GDOT will be responsible for all communications with the media; all inquiries from media shall be directed to GDOT for responses. The DB Team shall coordinate and collaborate with GDOT on the development of the Public Information and Communications Plan (PICP). The DB Team shall ensure updated Project information is provided to GDOT in a timely manner. The DB Team shall document all forms of Project communications with Customer Groups, interested citizens, stakeholders, and general public. The DB Team shall develop a PICP conforming to the requirements in Section 2.7.2.

2.1.3.2 Project Meetings
The DB Team attendance at each meeting shall, at a minimum, include all appropriate staff necessary to make decisions regarding the subject matter of the meeting to progress the Project and maintain the schedule. The DB Team shall “own” the meetings and shall prepare meeting agendas and distribute agendas a minimum of 24 hours in advance, and shall cause meeting minutes to be prepared and distributed within three (3) business days after the meeting. The DB Team shall, at the request of GDOT or its representative(s), hold additional meetings, and the DB Team shall cause additional staff to attend all meetings if requested by GDOT or its representative(s). At a minimum, the DB Team shall hold, participate, and prepare minutes in the following regular meetings with GDOT.
2.1.3.2.1 Weekly Meeting Requirements

1. Progress Meeting
2. Design Coordination Meeting(s) (may be separate meetings for major disciplines)
3. Submittals Review Team Meeting
4. ITS Communications Meeting
5. Construction Meeting (starting after NTP 3; may be combined with the Traffic Interruption Meeting)
6. Traffic Interruption Meeting

2.1.3.2.2 Twice Monthly (every Two Weeks) Meeting Requirements

1. Public Communications Team Meeting
2. ITS Communications Meeting
3. Utility Coordination Team Meeting
4. Quality Management/Compliance Team Meeting
5. Environmental Management Meeting
6. Materials Team Meeting
7. ROW Acquisition Team Meeting

2.1.3.2.3 Monthly Meeting Requirements

1. Schedule Review Meeting (shall be held the first week of each month)
2. Payment Request/Progress Status Team Meeting (shall be held the first week of each month)

As the Project progresses, the DB Team shall also hold work sessions with GDOT on Project technical design elements; these may include roadways, structures, Utility relocations, drainage and MS4, and other disciplines as needed to facilitate timely input from GDOT.

2.1.4 Project Management Controls System (PMCS)

GDOT will implement a project management controls system (PMCS) throughout the Term of the Agreement for workflows, file storage, communication, and correspondence. The DB Team shall utilize the PMCS provided by GDOT.

This PMCS provides all Project team members:

1. Centralized data that acts as a single source of truth and eliminates data redundancy.
2. Clear, efficient, and targeted access to Project information.
3. Efficient prosecution of the Work through consistent, streamlined processes.
5. Informed and streamlined decision-making.
6. Reporting to achieve the Program and Project objectives.

All Project team members shall be required to use this system for all official Project communications and interactions, including:

1. Correspondence, including payment items, notices of potential claims, and Supplemental Agreements
2. Project Management Plans in accordance with Section 2.2
3. Issues
4. Meetings/Meeting Minutes/Action Items
5. Design Management
6. Requests for Information (RFI)
7. Submittals as listed in Section 3
8. Schedule submittals as listed in Section 2.5
9. Nonconformance reporting (NCR’s)
10. Punch Lists
11. Reporting
12. Document Management (see Section 2.1.4.1.1 for the required File Naming Convention)
13. Construction Drawing Management (including management markups, versions and revisions)
14. Project Archiving and Closeout
15. Record Drawing Management

All Project team members shall utilize the PMCS on a daily basis to perform their Project responsibilities.

Additional requirements/guidelines of the system:

1. The PMCS shall be used to track and manage the Project and will be an official record of all Project communication. Organizations shall upload all Project-related information to the PMCS.
2. No later than thirty (30) calendar days after NTP 1, all Project team organizations involved shall designate a PMCS coordinator (an internal point of contact) and provide the coordinator’s name, phone, and e-mail to GDOT and the DB Team.
3. All users of this PMCS must complete training prior to having access to the system provided by GDOT.
4. All Project team members will be solely responsible for establishing and furnishing high-speed internet connectivity (fiber, cable modem, or DSL connectivity is recommended) to access the PMCS.

5. Submittals must be uploaded, submitted, tracked, and reviewed via the PMCS. In the case where physical samples are required, the submittal will still be reviewed and tracked via the system. The sample itself will be transmitted to the reviewer via traditional means.

6. The DB Team shall utilize the filing naming convention as provided in Section 2.1.4.1.1.

All Submittals shall be uploaded to the PMCS. Project documents shall comply with the naming convention requirements of GDOT's Electronic Data Guidelines (EDG). When not specified in the EDG, Project documents transmitted via the system must comply with the following electronic formats:

1. Documents generated in Computer Aided Design (CAD) applications (MicroStation V8 or InRoads) shall be submitted in Portable Document Format (PDF) generated by a PDF writer from the CAD application.

2. Documents that are marked up or unavailable in electronic format (drawings, sketches, correspondence, etc. generated by hand drafting methods) shall be scanned to Tagged Image Format version 5 or 6 [TIFF 5 or 6 (.TIF)], Bitonal [or Black and White (a.k.a. Line Art), on some scanners] (.tif) or PDF (.pdf), black and white with a resolution of 200 dpi using CCITT Group 4 (2d Fax) compression.

3. Documents that have been generated using PDF printer drivers (not scanned) shall be submitted via the system.

4. Electronic photographs shall be submitted in Joint Photographic Experts Group (JPEG) (.jpg) file format, sized at a minimum resolution of 1024 x 768 pixels.

5. Grayscale or color photo images that are scanned shall be saved in JPEG (.jpg) file format with medium to low quality compression at a resolution of 200 dpi.

6. Product data that is available for download from the manufacturer’s website that has been generated using PDF printer drivers (not scanned) may also be submitted via the system.

7. All design drawings shall be submitted in compliance with GDOT Electronic Data Guidelines, latest revision and all policies and guideline on GDOT’s Design Manuals and Guides website:


### 2.1.4.1.1 File Naming Convention

<table>
<thead>
<tr>
<th>PROJECT</th>
<th>Project Number. i.e.: 210327- (7 digit)</th>
</tr>
</thead>
<tbody>
<tr>
<td>YYYY</td>
<td>The digits representing the calendar year (e.g., 2018) the document is dated</td>
</tr>
</tbody>
</table>
The following file naming convention shall be used on all correspondence created or issued by the Project and for filing any document.

**PI_YEAR-MM-DD__DocType_File Name**

For example, July 4, 1776, will be represented as 1776-07-04.

All FINAL versions of documents shall be clearly identified and saved in the “Final Deliverables” folder as follows:

**PI_Date_File Type ID_File Name Final**

The DB Team may use “versions” or “drafts” included in the file name portion of the naming convention at the end of the file name for the non-final document. The following are file naming guidelines:

1. **Correspondence Files**: The file names of correspondence shall include the name of the correspondent, an indication of the subject, the date of the correspondence, and whether it is incoming or outgoing correspondence.

2. **Dates**: Dates shall always be presented ‘back to front’, that is with the year first (always given as a four-digit number), followed by the month (always given as a two digit number), and the day (always given as a two digit number).

3. **Keep File Names Short but Meaningful**: Some words add length to a file name but do not contribute towards the meaning, for example words like “the”, “a”, and “and”.

4. **No Spaces in File Names**: The use of an underscore “_” or a dash “-” “heading fields and words for ease in sorting. Use of caps to distinguish words for ease of reading is encouraged (i.e., Document_Management_Plan).

5. **Numbers in File Names**: To maintain the numeric order when file names include numbers, it is important to include the zero for numbers 0-9. This helps to retrieve the latest record number. i.e. 01, 02 … 99, unless it is a year or another number with more than two digits.

6. **Special Characters**: The use of special characters can cause problems with uploading, viewing and downloading documents over the internet. Special
characters @ # $ % ^ & * , ? shall not be used in filenames. Even if your operating system allows you to save the file you may encounter difficulties if you try to transport the file to another operating system; for example, the file may not be recognized, or if you send it to someone else they may not be able to open it.

Table 2-1: File Type Identification Table

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</tr>
<tr>
<td>ADV</td>
<td>Advertisement</td>
<td>Advertisements to the public, such as advertisement for intent to post RFQ, advertisements for public meetings (Public Information Open House (PIOH) and Public Hearing Open House (PHOH)), etc.</td>
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<td>ACP</td>
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<td>COR</td>
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<tr>
<td>CDO</td>
<td>Contract Document, RFP, RFQ</td>
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<tr>
<td>DBE</td>
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<td>DWG</td>
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<tr>
<td>PDI</td>
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<td>Examples: bottomless culvert product catalog, guardrail beam information, etc.</td>
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<td>REV</td>
<td>Plan Revisions</td>
<td></td>
</tr>
<tr>
<td>RFC</td>
<td>Released for Construction</td>
<td></td>
</tr>
<tr>
<td>RFI</td>
<td>Request for Information</td>
<td>Construction related issues and request for information.</td>
</tr>
<tr>
<td>RFP</td>
<td>Request for Proposal</td>
<td></td>
</tr>
<tr>
<td>RFQ</td>
<td>Request for Qualifications</td>
<td></td>
</tr>
<tr>
<td>ROW</td>
<td>Right of Way</td>
<td></td>
</tr>
<tr>
<td>RPT</td>
<td>Report (All Technical Reports)</td>
<td>All technical analyses, studies, whitepapers, etc.; excludes</td>
</tr>
</tbody>
</table>
2.1.5 Document Management

The DB Team shall establish and maintain an electronic and hardcopy document control system to manage, store, catalog, and retrieve all Project-related documents in a format that is accepted for use by GDOT. Unless otherwise directed by GDOT, record retention shall comply with the requirements included in the Retention Schedules for State Government Paper & Electronic Records, State Agency Specific Schedules for GDOT, and any other applicable local, state, and federal guidelines. All documentation and content shall be provided to GDOT at the time of the expiration or earlier termination of the Agreement.

At a minimum, the DB Document Management System shall:

1. Establish standardize procedures for document control.
2. Provide for effective PMCS training.
3. Ensure that documents are safely secured, protected from loss, damage or deterioration, maintained and readily retrievable and available for use by persons with access approval.

4. Index documents received or collected for systematic filing.

5. Preserve all Project records.


7. Provide an audit function to ensure that Document Management policies and procedures are being consistently followed.

2.1.5.1 Backup of Electronic Files and Protection of Hardcopy Files

All Project content shall be protected from loss, damage, and deterioration. The DB Team shall provide a secure, fireproof location with controlled access in which to store electronic and hardcopy backup files.

2.1.6 Joint Project Inspection

The DB Team shall conduct a Joint Project Inspection of the Project area with the Construction Maintenance Limits Plan and obtain GDOT approval no later than one hundred and eighty (180) days after NTP 1. The physical in-field Joint Project Inspection shall be performed by a GDOT-authorized representative and the DB Team, and attended by GDOT, if desired. The purpose of the Joint Project Inspection is to create a physical baseline of the existing real estate and permanent fixtures and assets of GDOT prior to the start of construction. The area shall encompass the entire Project area including areas outside the limits of the Project, as there will be required Elements outside the actual Project limits.

The DB Team shall clean the existing drainage system sufficiently enough to allow for the proper detailed inspection of the system during the joint inspection within the Construction Maintenance Limits and as required in Section 19.

The Joint Project Inspection Submittal shall include the following:

1. Preliminary Plan or Construction Maintenance Limits Plan providing marked-up notes of deficiencies and location reference for cross-referencing any photographs or additional information denoting the existing condition of the infrastructure within the proposed Construction Maintenance Limits Plan area.

2. Pre-construction digital photographs and high-resolution digital video of the Project Area including all existing facilities, structures, and environmentally sensitive areas that can readily depict the exact conditions of the existing Elements of the Work. The DB Team shall provide a sample report of a section of the Project to determine the level of expected accuracy and increments of the photo documentation.

3. Intermittent photographs along the pavement and shoulders to clearly depict the existing condition of the pavement and shoulders that will be utilized during
construction. The DB Team shall be responsible for maintaining the existing pavement and shoulders to a condition equal to or better than existing conditions at all times during the Design-Build Period.

4. Video recording prior to the beginning of construction and at Final Acceptance of all existing underground storm and sanitary sewer systems within the Construction Maintenance Limits Plan or to the nearest structure outside the Construction Maintenance Limits Plan, whichever is greater.

5. Pre-construction digital photographs and high-resolution digital video of existing bench marks, temporary bench marks, existing utilities, and trees and plants to remain.

The DB Team shall restore the Existing ROW outside the General Purpose lanes and within the construction maintenance limits to a condition equal to or better than existing conditions by Substantial Completion.

2.1.7 Photography

The DB Team shall provide monthly aerial photo submittals (one hardcopy and both high-resolution and low-resolution digital files), a minimum of two (2) photos of the entire Project and three to four (3-4) photos per phase at GDOT-specified locations on the Project for the various phases of construction. Photos shall be taken from the same angle, elevation and location as previously taken, in order to show the progress of the Work from commencement of construction to Substantial Completion. Hardcopy photographs shall be 8-inch by 10-inch size.

All data shall become property of GDOT. The DB Team will be responsible for any photography equipment installation, including power, and maintenance of the equipment at all times. All photographs shall be labeled and cataloged with the date and time the photograph was taken, and a brief description of the location and view.

In addition to the requirements for photography submittals found elsewhere in these Technical Provisions, one electronic copy of all photographs shall be filed in a single folder on the PMCS, cataloged in a logical manner as approved by GDOT.

2.1.8 Requirements for GDOT Office and Equipment

Refer to Volume 2

2.2 Project Management Plans

The Project Management Plan shall document the procedures and processes that are in effect to provide timely information to the Project decision makers to effectively manage the scope, costs, schedules, and quality of, and the Federal requirements applicable to, the Project; and the role of the agency leadership and management team in the delivery of the Project. The DB Team is required to complete the following Management Plans/documents and include as Appendices to the Project Management Plan in addition
to the Project Management Plan requirements in this Section 2. The requirements of these management plans and documents can be found throughout the Technical Provisions.

2.2.1 **Project Management Plan Requirements**

The DB Team shall submit the following management plans for GDOT review and acceptance or approval:

1. Design Schematic of the Project (Project Differences from Reference Information Documents and incorporating approved ATC concepts, provided at time of Proposal Submission)
2. Project Schedule and accompanying narrative report, pursuant to Section 2.5
3. Project Quality Management Plan and other Quality Management Plans, pursuant to Section 2.3
4. Safety Plan, pursuant to Section 2.2.4
5. Construction Phasing Plan, pursuant to Section 2.2.5
6. Public Information and Communications Plan (PICP), pursuant to Section 2.7.2.1
7. Comprehensive Environmental Protection Program (CEPP), pursuant to Section 4.3
8. Hazardous Materials Management Plan, pursuant to Section 4.4
9. ROW Acquisition Plan, pursuant to Section 5.8
10. Demolition and Abandonment Plan, pursuant to Section 10.2
11. Transportation Management Plan (TMP), pursuant to Section 18.2.1
12. Construction Maintenance Limits Plan, pursuant to Section 19.2
13. Maintenance Management Plan, pursuant to Section 19.3

All audits, findings and reports shall be provided to GDOT with all submittals.

A QA/QC statement letter shall be submitted with all Submittals.

2.2.2 **Administrative Functions**

The Project Management Plan shall include the DB Team’s plan for planning, organizing, staffing, directing, and controlling the day-to-day operations necessary for effective decision-making and Project performance.

2.2.3 **Project Team Communications**

Project Team communications shall be identified in the Project Management Plan.

2.2.4 **Safety Plan**

The DB Team shall submit to GDOT for acceptance a comprehensive safety plan ("Safety Plan") that is consistent with and expands upon the preliminary safety plan submitted with
the Proposal. The Safety Plan shall fully describe the DB Team’s policies, plans, training programs, Work Site controls, and Incident response plans to ensure the health and safety of personnel involved in the Project and the general public affected by the Project during the Term of the Agreement.

The DB Team’s Safety Plan shall address procedures for immediately notifying GDOT of all Incidents arising out of or in connection with the performance of the Work, whether on the Site or not.

See Section 2.4 for additional requirements.

2.2.5 **Construction Phasing Plan and Submittals Schedule**

The DB Team may design and construct the Project in multiple phases. A Construction Phase is a portion (segment) of the overall Project. If the Project will be designed and constructed in multiple phases, then the DB Team shall provide a Construction Phasing Plan and Submittals Schedule for each construction phase within thirty (30) days from NTP 1.

The Construction Phasing Plan shall provide logical termini for each proposed segment or phase of the Work and must consider any phasing of required acceptances. For each given Construction Phase, the DB Team shall be allowed to either submit a complete set of drawings or make a series of Staged Design Submittals (components). The timing and content of Staged Design Submittals must be logical and shall include or be preceded by related items (e.g., bridge submittals must include or be preceded by related highway geometry; a bridge and its related retaining walls must be submitted together; etc.). The Submittals Schedule shall identify all proposed Staged Design Submittals and what components will be included in each.

The DB Team must obtain GDOT acceptance of the Construction Phasing Plan and the Submittals Schedule prior to providing any design submittals for GDOT review. In addition, a “Design Submittal Guide” including a proposed index of plan sheets for each Construction Phase must be submitted and accepted prior to providing any design submittal. Once accepted, this Design Submittal Guide shall be updated and provided with each subsequent design submittal. File naming of each plan sheet in a submittal shall correspond to the final index name of the plans for ease of reference to create the final set of drawings. The Design Submittal Guide shall also include all reports, specifications, studies, calculations, and supporting documents and information.

The DB Team has the right to propose phasing the design and construction of the Project to accelerate the schedule and provide added value. GDOT reserves the right to review, require revisions, or request additional conditions to the proposed phasing plan prior to acceptance. Each phase of the proposed plan will require an NTP.
2.2.6  **Public Information and Communications Plan**

The DB Team shall support the execution of an approved Public Information and Communications Plan under GDOT supervision that includes stakeholder involvement and public information strategies to engage and inform key stakeholders. Refer to Section 2.7 for further information and requirements.

2.2.7  **Comprehensive Environmental Protection Program**

The DB Team shall develop, execute, and maintain a Comprehensive Environmental Protection Program (CEPP) for the Work to ensure environmental compliance with all applicable environmental laws and commitments. The DB Team’s CEPP shall comply with the requirements of Section 4.3.

2.2.8  **Right of Way Acquisition Plan**

The DB Team shall provide a Right of Way Acquisition Plan in accordance with Section 5.8, and shall provide Right of Way plans for any required Additional Properties identified in Section 7.2.

2.2.9  **Demolition and Abandonment Plan**

The DB Team shall develop a Demolition and Abandonment Plan for all existing structures, features, and utilities as described in Section 10.2 (types and sizes) that will be removed, abandoned or partially abandoned during the Term. The Plan shall ensure that said structures are structurally sound after the abandonment procedure. The Plan shall show the locations of all existing features that will be abandoned and shall show sufficient detail for the Abandonment.

2.2.10  **Transportation Management Plan**

The DB Team shall develop a Transportation Management Plan and a traffic control plan for each phase of its Work. The DB Team’s Transportation Management Plan and the traffic control plans shall comply with the requirements of Section 18.

2.2.11  **Construction Maintenance Limits Plan**

The DB Team shall develop a Construction Maintenance Limits Plan; refer to Section 19 for additional requirements. The plan shall identify the physical boundaries of the DB Team’s maintenance responsibilities for the construction Work during the Design–Build Period. If the DB Team decides to use part of the facility outside of the specified maintenance limits by any means, such as lane/shoulder closures, staging, or any other activity, the DB Team will be obligated to maintain and repair any element affected as required above, and the Construction Maintenance Limits Plan shall be revised to incorporate the new maintenance limits.

2.2.12  **Maintenance Management Plan**

The DB Team shall develop, implement, and maintain, for the Term, a Maintenance Management Plan for routine maintenance of all existing infrastructure as described in
Section 19.3. The Plan shall identify maintenance elements, frequency of monitoring and inspection, levels of importance (emergency, urgent, periodic/routine), processes and repair and/or execution periods per the standards in Section 19. The DB Team shall provide the information in tabular format for ease of review and monitoring.

2.2.13 Hazardous Materials Management Plan

The DB Team shall develop, execute, and maintain a Hazardous Materials Management Plan (HMMP) for the Work to ensure compliance with all applicable environmental laws and commitments dealing with hazardous materials. The DB Team’s HMMP shall comply with the requirements of Section 4.4.

2.3 Quality Management Requirements

2.3.1 General

Personnel assigned to perform independent design reviews or monitoring of characteristics for quality control shall not be those personnel performing or directly supervising the Work being accepted. The DB Team’s Quality Assurance Manager and quality control staff shall have no responsibilities in the production of the Work.

The Quality Assurance Manager shall prepare a monthly report of the quality reviews, inspections and tests performed, results of such reviews, inspections and tests, and occurrences and resolution of non-conformance discoveries. The DB Team shall submit the monthly reports to GDOT for review.

The DB Team’s Quality Assurance Manager and quality control manager(s) shall have the authority to stop Work for quality-related issues. The DB Team shall conduct all Work necessary to meet the requirements of the DB Documents and this Section 2.3 and to satisfy all functional needs and characteristics of the quality program, including quality control (QC), quality assurance, and quality improvement.

The DB Team is responsible for all aspects of quality of the Work and must accommodate and cooperate with GDOT’s Quality Acceptance (QA) and Independent Assurance program. The DB Team’s approach to quality, including coordination with GDOT’s QA efforts, shall be developed in the DB Team’s quality program. The DB Team’s quality program shall be documented in a Quality Management Plan (QMP). The DB Team shall create the quality program and develop the QMP in cooperation with GDOT.

Materials and equipment installed as part of any permanent construction shall be new, unless otherwise specified. The DB Documents contemplate the use of first-class materials and equipment throughout the performance of the Work. For any material for which no particular specification is given, the DB Team shall provide the applicable specification and the material shall be of the highest quality of its class or kind. For the purpose of this provision, “new” shall mean purchased specifically for the Project.
2.3.2 Quality Management Plan

The DB Team shall submit a comprehensive Quality Management Plan (QMP) to GDOT for quality control activities, coordination with quality acceptance, and which conforms to the quality assurance procedures with provisions contained in GDOT’s Quality Control and Quality Assurance Program and 23 Code of Federal Regulations 636 and 637. The QMP shall be submitted to GDOT for review no later than thirty (30) days from NTP 1. GDOT approval of the QMP is a condition precedent to issuance of NTP 3. All audits, findings and reports shall be provided to GDOT with all design and construction submittals.

The DB Team shall develop, implement, and maintain the QMP for the Term. The QMP shall describe the system, policies, and procedures that ensure the Work meets the requirements of the DB Documents and provides documented evidence of same.

The complete QMP shall encompass all Work performed by the DB Team and Contractors of all tiers.

The QMP shall contain detailed procedures for DB Team’s quality control and quality assurance activities. DB Team’s quality process shall incorporate planned and systematic verifications and audits undertaken by construction quality assurance staff and the Independent Design Reviewer (IDR). DB Team shall conduct all quality control, quality assurance, and design overlay and coordination among design disciplines, all in accordance with the QMP and the requirements of the DB Documents.

When required by GDOT Specifications and/or DB Documents, inspections, reviews, and testing performed by the DB Team shall only be performed by entities prequalified by GDOT with training, qualifications, and certifications using equipment that is accurately calibrated and maintained in good operating condition at an AASHTO Materials Reference Laboratory (AMRL) (American Association of State Highway and Transportation Officials (AASHTO) R18, “Establishing and Implementing a Quality System for Construction Materials Testing Laboratories”) accredited facility, or at a facility with comparable certification (e.g., International Organization for Standardization (ISO) 17025, “General Requirements for the Competence of Testing and Calibration Laboratories”).

2.3.2.1 Project Quality Management Plan

The DB Team shall organize the QMP as follows:

1. Project Quality Management Plan (PQMP) - a quality policy statement shall be provided which contains a complete description of the quality policies and objectives that the DB Team will implement throughout its organization. The policy shall demonstrate the DB Team senior management’s commitment to implement and continually improve the quality management system for the Work. The Quality Management Plan will also include policies, plans, processes and procedures for:
a. Organizational requirements with contact information of the DB Team’s Organization as defined
b. Roles and responsibilities of the Quality Team
c. Administrative processes and procedures common to both design and construction quality management
d. Quality records management processes and procedures
e. A comprehensive noncompliance process
f. DB Team’s internal and third party quality and compliance auditing processes and procedures
g. Document control
h. Independent auditing of administrative and management processes
i. Certification process for all Payment Requests and Completion Deadlines

2. Design Quality Management Plan (DQMP) - including plans, processes and procedures for:
   a. Design development, including checking, peer review, cross-discipline coordination for developing Project plans, specifications, and estimates with supporting technical documentation
   b. Managing design reviews and changes during design and construction
   c. Design decision making
d. Design communication, coordination, and collaboration
e. IDR activities and comment resolution
f. Managing GDOT reviews and responses to submittals, Work Change Directives, and Change Requests
g. Design and engineering support during construction, witnesses tests, reviewing quality inspection and test records, responding to Request For Information (RFI’s) applications and field changes
   h. Independent auditing of design quality management
   i. Design criteria adherence
   j. Non-compliance management

3. Construction Quality Management Plan (CQMP) - including plans, processes and procedures for:
   a. Tracking, Measuring and documenting construction progress
   b. Construction decision making
   c. Ensuring that only the most up to date Released for Construction documents are used
   d. Plan/Protocols for inspection, testing and maintaining quality certifications
e. Managing reviews and responses to Construction Documentation (RFIs, Field Changes, Design Changes, Construction Changes, Claims, etc., during construction)

f. Managing and tracking accepted construction changes

g. Managing and controlling construction schedule

h. Construction communication, coordination, and collaboration

i. Environmental compliance

j. Non-compliance management

Quality Management Plan forms and checklists are to be used to facilitate and document QA efforts including pre-work activity checklists that depict all items required to perform the particular design, construction and operational efforts, such as; means and methods, subcontractor involvement, materials and inspection / testing requirements.

The DB Team shall maintain construction workmanship and materials quality records of all inspections and tests performed per the approved CQMP. These records shall include factual evidence that the required inspections or tests have been performed by GDOT and its representative, including type and number of inspections or tests involved; results of inspections or tests; nature of defects, deviations, causes for rejection, etc.; proposed remedial action; and corrective actions taken. These records shall cover both conforming and defective or deficient features, and shall include a statement that all supplies and materials incorporated in the Work are in full compliance with the terms of the DB Documents. These records shall be available for review and audit to GDOT inspectors.

2.3.2.2 Independent Design Review and Checks

The DQAM, through the DB Team, shall provide to GDOT and the Utility Adjustment Team (UAT) a plan and written procedures for the independent design check. An independent design check shall be provided for each design Submittal prior to being submitted to GDOT. The DB Team shall provide, when requested by GDOT, all comments and comment responses between the DB Team's EOR and the DQAM's independent design review for each Submittal review.

The independent design review personnel may not be involved in the production of the design being reviewed and shall either be employed by a different engineering firm than the EOR, or if employed by the same engineering firm, the independent design review personnel and DQAM must be appropriately firewalled from the design production. Those performing the checks should have equal or greater qualifications and experience as the EOR for the design being checked.

Independent design checks are comprised of design assessments and analytical checks as follows:

Design Assessment – a review of general compliance with the requirements of the DBA, including taking into consideration the following areas:
1. Project design criteria
2. Applicable codes and standards
3. Methods of analysis
4. Computer software and its validation
5. Interface requirements
6. Materials and material properties
7. Durability requirements
8. Constructability
9. Context Sensitivity
10. Environmental compliance
11. Any required Design Exceptions or Variances

The DB Team shall submit to GDOT, and FWHA as appropriate, all requests for Design Exceptions and Design Variances, including justification and supporting documentation, for review and approval.

Analytical Check – a review using separate calculations (and without reference to Designer’s calculations) to establish the structural adequacy and integrity of structural members. This includes:

1. Structural geometry and modeling
2. Material properties
3. Member properties
4. Loading intensities
5. Foundation loads
6. Structural boundary conditions

2.3.2.3 Submittal Requirements

The DB Team shall obtain GDOT’s approval of the QMP in two stages: first, for all non-Construction Work related procedures and plans (Stage 1); second, for all elements of the Work, including Construction Work-related procedures and plans (Stage 2).

GDOT will deliver its approval or disapproval and provide comments on the QMP submission within thirty (30) Calendar days following GDOT’s receipt of the QMP. The DB Team shall revise its QMP within seven (7) Calendar days upon notification by GDOT of its disapproval or receipt of comments. Each subsequent submittal or iteration of the QMP shall include the same review duration for GDOT and revision duration for the DB Team.

The Stage 1 QMP, shall be submitted to GDOT for review no later than thirty (30) days after NTP 1 and no administrative or design Submittal will be reviewed by GDOT until
Stage 1 of the QMP is approved. NTP 3 will not be issued and no Construction Work can commence until the entire QMP is approved.

2.3.2.4 GDOT Access and Quality Reporting

The QMP shall incorporate all GDOT access and the DB Team reporting requirements of the DB Documents, including the following:

1. The DB Team shall immediately file all quality documentation and make all quality records available to GDOT at all times and shall provide GDOT with a hardcopy of any and all quality records within twenty-four (24) hours of when requested.

2. The DB Team shall submit to GDOT the results of all internal audits within seven (7) days of their completion.

3. The DB Team shall promptly submit to GDOT non-conformance reports, but no later than twenty-four (24) hours of their issuance and again from their resolution.

The QMP shall outline a reporting process for recording, organizing, and distributing a record of internal quality activities. Quality reports shall be distributed to the DB Team’s and GDOT’s management personnel. Reports must be prepared and submitted monthly with the progress reports. These reports shall include a summary of all internal quality activities for the reporting period, and the status of any Non-Conformance Reports (NCRs) issued or unresolved during the reporting period. The reports shall also include a summary of Quality improvements, and include all proposed or actual corrective actions suggested or taken by the DB Team and the associated GDOT responses.

2.3.2.5 Quality Management Plan Updates

After the QMP has been approved, the QMP shall be subject to changes from time to time (including clarifications, modifications, additions, and deletions), which may be initiated by the DB Team, the CQAM, or GDOT. Such changes initiated by GDOT are made under GDOT’s approval authority and may result in the DB Team expending additional resources and time to comply with the revised QMP. No such change constitutes a Compensation or Relief event and is not eligible for additional compensation or time extension. Any revisions to the QMP initiated by the DB Team or CQAM requires prior GDOT approval. Upon GDOT approval, the revised QMP shall then be in effect.

The DB Team shall regularly maintain and update the QMP to ensure it is accurate and up-to-date, including for the following information:

1. The organizational chart identifying all quality management personnel, their roles, authorities, and line reporting relationships.

2. Names and descriptions of the roles and responsibilities of all quality management personnel and including which have the authority to stop Work.

3. Identification of testing agencies, including information on each agency’s capability to provide the specific services required for the Work, certifications held, equipment, and location of laboratories.
The QMP shall be conformed and updated annually. The DB Team shall revise its QMP within fourteen (14) days of GDOT or DB Team detection of a substantial or systemic problem related to the Work, or as directed by GDOT. Submissions of the QMP and all updates to the QMP shall include both a clean copy and a copy tracking all changes since the previous approval.

2.3.3 Nonconforming Work and Corrective Action

The QMP will identify a process for documenting, reporting, and tracking all elements of the Work in a manner consistent with ISO 9001 that have not conformed, or are believed not to conform, to the requirements of the DB Documents. NCRs shall be issued as a result of such non-conformances. Examples of nonconformance include: physical defects; test failures; incorrect or inadequate documentation; or deviation from the design processes, inspection, or test procedures described in the Project QMP. The process developed within the QMP shall address the tracking and reporting of issuance, comments and discussions, and ultimate resolution of all NCRs.

2.3.3.1 General

The QMP will identify the process for responding to all NCRs. The NCR remediation process will include a report which clearly describes the element of Work that is non-conforming, the reason for the non-conformance, and details the remedial actions proposed (rework or repair) to achieve conformance to the Contract requirements. Any proposed remediation shall be approved by GDOT prior to it being performed. The remedial actions employed will undergo the same level of inspection and testing as required for the original Work.

GDOT will implement and the DB Team must use a PMCS, which will have the capability for documenting and implementing the NCRs, that includes the description of the NCR, corrective action, action to prevent, the defined roles, dispositions, tracking log, and workflow states.

The DB Team shall provide a full description of the NCR’s nature, date, location, and any other pertinent facts, and also indicate the root cause, corrective action(s), and other action(s) to prevent its recurrence. The responsible organization shall submit a proposed disposition to GDOT of the Nonconforming Work that has been reviewed and approved by the DB Team’s Quality Assurance Manager (QAM) and EOR. If the disposition is not accepted by GDOT, the NCR will remain opened until the disposition is accepted by GDOT.

The QAM will maintain a log of all NCRs and submit it weekly to GDOT. Number each NCR sequentially and provide a brief description and status.

2.3.3.2 Initiating an NCR

The DB Team, CQAM, or GDOT can initiate an NCR. Only the initiating party may close an NCR they initiated. The Originator closes the NCR document once all requirements
have been met. An NCR cannot be closed until all requirements have been met and the disposition approved by GDOT.

Table 2-2: Non-Conformance Report Workflow States

<table>
<thead>
<tr>
<th>State</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Draft</td>
<td>Indicates that the NCR is being written.</td>
</tr>
<tr>
<td>Active</td>
<td>Indicates that the NCR has been submitted to the DB Team, which shall provide causes, corrective actions, actions to prevent recurrence, and a disposition for the Nonconforming Work.</td>
</tr>
<tr>
<td>Pending Review/Correction</td>
<td>Indicates that the DB Team has responded with a proposed disposition, and the disposition is under review. The document is routed to appropriate parties for approval of the disposition.</td>
</tr>
<tr>
<td>Pending Closure</td>
<td>Indicates that the Nonconforming Work has been corrected, and the DB Team is waiting for inspection, verification and closure.</td>
</tr>
<tr>
<td>Closed</td>
<td>Indicates that the nonconformance has been resolved satisfactorily, and the NCR is closed.</td>
</tr>
</tbody>
</table>

2.3.3.3 Disposition Options

After an NCR is initiated, the initiating party provides a proposed disposition. Options available for the disposition are:

- **Reject** – The Work is unsuitable for its intended use and incapable of being reworked or repaired to meet the specified requirements of the DB Documents.

- **Rework** – The deficiency can be brought into conformance with the DB Documents through re-machining, reassembling, reprocessing, reinstalling, or completing the required operations. In cases of rework, an inspection is required after completion to verify the rework is satisfactory.

- **Repair** – Action is required that will result in making the Work acceptable for its intended use, as determined by an engineering evaluation, although the item might not meet all of the requirements of the DB Documents. In cases of repair, an inspection is required after completion to verify the rework is satisfactory. If the repair does not meet all of the requirements of the DB Documents, it may be subject to a deduction for Nonconforming Work, upon the discretion of GDOT.

- **Accept-as-is** – Allows the use of the Work completed that does not meet all requirements of the DBA, but it is determined by engineering evaluation that the Work will satisfy its intended use. If the Work is Accepted-as-is and does not meet
all of the requirements of the DB Documents, it may be subject to a deduction for non-conforming Work, upon the discretion of GDOT.

### 2.3.3.4 Corrective Action

In addition to the resolution of a nonconformance on an individual basis, the corrective action process will urgently recognize, report, and resolve systemic and serious deficiencies, including:

- Repetitive NCRs that indicate inadequacies in either production processes or inspections.
- Issues of safety or conditions likely to have a significant effect on the Project.
- Quality procedures not being carried out in a timely fashion.

The Corrective Action mechanism will address the possibility that the personnel responsible for the relevant activity might be a primary cause of the deficiencies. Remedial action might involve additional training and, in some cases, removal of personnel or Contractors or Subcontractors from the activity or Project.

### 2.3.4 Quality Terminology

Quality terminology, unless defined or modified elsewhere in the DB Documents, shall have the meaning defined in ISO 9001. Terms used in ISO 9001 shall have the meanings defined below:

- **Organization:** The DB Team’s organization, including any Affiliates and Contractors.
- **Customers:** The Users of the roadways, GDOT, and Customer Groups

### 2.3.5 Quality Organization

The DB Team shall provide QA and QC for management, design, and construction of the Project, and verify that all environmental and permit commitments are met to ensure the Work conforms to the DB Document requirements. The QMP shall detail the quality organization.

In preparing the QMP, the DB Team shall ensure that the QMP complies with the applicable environmental requirements and the GDOT and AASHTO publications listed in these Technical Requirements. The DB Team shall revise the QMP and its implementation when repetitive or recurring quality issues arise.

The DB Team’s QMP shall include an organizational chart of the QA and QC personnel, or quality team, including the Project QAM, the CQAM, the DQAM, the QC manager/superintendents, personnel in charge of QA and QC activities, and any other personnel the DB Team acknowledges as having significant quality-related responsibilities from the DB Team to the quality team. The QMP shall list the number of
full-time equivalent employees, specific responsibilities for each employee, and the lines of authority and reporting responsibilities.

This organizational chart shall be updated to reflect any changes in QA and QC personnel as the Project progresses.

2.3.6 Responsibility and Authority of DB Team Staff

The personnel and organizations performing QA functions shall have sufficient authority and organizational autonomy to identify quality issues, and to be able to initiate, recommend, and verify implementation of Corrective Action plans. Personnel performing QA functions shall be at an organizational level that ensures they will not be influenced by the impact of the QA measures on the Project schedule, performance, or cost. The QMP shall list by discipline the name, qualifications, applicable certifications, duties, responsibilities, and authority for all personnel proposed to be responsible for QA and QC. Personnel performing QA functions shall not be assigned to perform conflicting duties.

The DB Team’s QA team is responsible for obtaining all documentation necessary for approval and acceptance of materials; obtaining materials certifications as required; ensuring that all required materials testing is completed; and ensuring that all test results meet the DB Document requirements. The DB Team’s QA team shall inspect all Work and ensure that sufficient QA staff is present to determine whether the Work complies with DB Document requirements, in accordance with the process required in the Contract Documents and the approved QMP.

Personnel assigned to perform inspection, testing, or monitoring of characteristics for QC shall not be those personnel performing or directly supervising the Work being accepted. The DB Team’s QAM and QA managers and staff shall have no responsibilities in the production of the Work.

The QM shall prepare a monthly report of the quality inspections and tests performed, results of such inspections and tests, and occurrences and resolution of non-conformance discoveries. The DB Team shall submit the monthly reports to GDOT for review.

The DB Team’s QAM, CQAM, DQAM, and QC Manager(s) shall have the authority to suspend all or a portion of the Work because of quality-related issues.

2.3.6.1 Project Quality Assurance Manager

The DB Team shall designate a Project Quality Assurance Manager (QAM) who shall be responsible for developing and updating the QMP, ensuring that all elements of Work are performed in accordance with the DB Documents, and ensuring adequate staffing and expertise is being utilized for the DB Team’s QA and QC efforts.

The Project QAM shall report directly to the person or group with overall Project management responsibilities such as the Project Manager, an off-Site principal with binding authority for the DB Team, or an executive oversight committee established for
the Project. The QAM could be an employee of the DB Team or be the DQAM, or the CQAM but cannot be both the Design and Construction QA Managers.

2.3.6.1.1 Minimum Qualifications

The Project Quality Assurance Manager shall have recent experience in the management of a quality management program.

2.3.6.2 Design Quality Assurance Manager

The DB Team shall designate a Design Quality Assurance Manager (DQAM) who shall have overall responsibility for the design portion of the QMP. Through audits, the DQAM shall be responsible for verifying and validating that the QA and QC procedures required by the QMP are administered and being followed. The DQAM shall audit design packages for both temporary and permanent Work. The DQAM shall report to the Project QAM. The DQAM could also be the Project QAM, but cannot be the CQAM.

In accordance with this Section 2.3.6.2 and the QMP, the DQAM shall certify that all Design Documents have been subjected to all required QC checking procedures; all documentation has been completed and filed in an acceptable manner; and all design packages have been subjected to a QA audit prior to submittal to GDOT or prior to release.

2.3.6.2.1 Minimum Qualifications

The DQAM shall be a Licensed Professional Engineer in the State of Georgia and have recent experience in the design of highway or bridge projects. Generally, the DQAM must have equal or greater qualifications and experience as the EOR.

2.3.6.3 Construction Quality Assurance Manager

The DB Team shall employ a Construction Quality Assurance Manager (CQAM), who shall have overall responsibility for development and implementation of the construction portion of the QMP. The CQAM shall be responsible for implementing, monitoring, and adjusting the processes to ensure acceptable quality. The CQAM shall report directly to the Project Quality Manager. The CQAM could also be the Project Quality Manager (QM) but cannot also be the DQAM.

It is the responsibility of the CQAM to implement quality planning and coordinate with GDOT’s testing and inspection requirements. The CQAM shall not be assigned to perform conflicting duties on the Project. The CQAM shall have the authority to stop any Work that does not meet the standards, specifications, or criteria established for the Project.

The CQAM or a designated Assistant CQAM shall be on the Project at all times Construction Work is being performed or available so that they can be on the Project Site within 2 hours of being notified of a problem regarding the QA of any Work being performed by the DB Team, or any of its subcontractors or agents.
2.3.6.3.1  Minimum Qualifications

The CQAM shall have recent experience in construction quality management for highway or bridge projects.

2.3.6.4  QA Staffing and Training

Quality personnel, including employees of the DB Team and its subconsultants and subcontractors, shall have been trained in the applicable quality procedures, including for inspection of the Work, environmental monitoring, and material sampling and testing. The professional training and experience of the quality personnel shall be commensurate with the scope, complexity, and nature of the activity to be checked or monitored.

2.3.7  Design Quality Management

The DB Team is solely responsible to provide Project Design Documents of such a nature to deliver the finished construction Work in accordance with all DB Document requirements. GDOT comments pertaining to Design Documents shall not relieve the DB Team of that responsibility. The DB Team shall not begin Construction Work until all GDOT comments on the applicable design Submittal are resolved to the satisfaction of GDOT, and the plan is issued as an RFC.

The DB Team shall assign a Design Quality Assurance Manager that shall be responsible for the supervision and quality of all Design Work and design processes, including the following:

1. Accuracy
2. Adequacy
3. Conformance to professional standards of practice
4. Compliance with all legal requirements and standards mandated by the DBA
5. Cost effectiveness
6. Quality
7. Fitness for purpose and function as specified or implied in the DB Documents

At GDOT's discretion, GDOT will perform periodic audits of the DB Team's design quality management at a frequency no less than monthly.

2.3.8  Construction Quality Management

Prior to the commencement of any construction activities, the Design-Build (DB) Team shall develop and implement a Construction Quality Management Plan (CQMP) for all phases of construction.

2.3.8.1  Quality Control Program

The DB Team shall be fully responsible for the quality of the Work, QC, and for all QC activities specified by the DB Documents. The DB Team's QC portion of the CQMP shall
include the internal procedures used by the DB Team that will ensure that the Work is delivered in accordance with the released-for-construction plans, shop drawings, working drawings, and specifications (as applicable). The DB Team's CQMP shall establish a systematic approach to define the processes, methods, procedures, and documentation for delivery of QC on the Project. These methods and procedures shall clearly define the authority and responsibility for the administration of the DB Team's QC plan. The DB Team’s QC shall not be part of the acceptance program.

### 2.3.8.2 Control Point Inspections

A control point is a point in time when construction has proceeded to a defined stage and at which representatives of the DB Team's production and QC staff determine the conformance of the Work to that point.

The DB Team shall notify GDOT in writing three (3) days in advance prior to the expected inspection time and 24 hours in advance of the actual inspection for the following activities: pre-pour conferences; pre-pour checks for footing rebar, cap rebar, column rebar, deck rebar, approach slab rebar, and barrier wall rebar; driving piles; setting beams; subgrade compaction; sub-base compaction; and compaction under the approach slabs.

The QMP shall specify processes for monitoring the progression of Work through the tracking of control points. The process should be designed to aid in progressing Work, verifying payments, and avoiding duplicate inspection, testing, and reporting. The DB Team shall provide this information on the Five-Week Detail Schedules required by Section 2.5.6 for all upcoming Work to be inspected.

GDOT or the DB Team may identify additional control points, subject to acceptance by GDOT, to be included at any time throughout the Project which addition, individually or in aggregate, shall not constitute a Compensation Event or Relief Event. GDOT will coordinate to define the procedures and criteria for additional control points.

### 2.3.8.3 Environmental Compliance

The QMP shall describe the methods, processes, and procedures to provide for the effective implementation and documentation of the environmental protection, training, compliance, and monitoring program. The DB Team, through the QMP, shall be responsible for the quality of Work, including the workmanship and products of Affiliates, Contractors, Subcontractors, fabricators, suppliers, and vendors for environmental compliance monitoring.

### 2.3.8.4 Non-Field-Tested Materials

GDOT will provide construction engineering acceptance inspection and testing through the Office of Innovative Delivery, or its designee, in accordance with GDOT Specifications and the Design Documents.
GDOT will provide plant inspection, testing and certification of plant produced materials at existing GDOT approved plant locations, such as for precast/pre-stressed concrete, asphalt, and structural steel fabrication.

2.3.9     Final Inspection

At the completion of constructed elements of the Work, the CQAM will jointly conduct a final inspection with GDOT and the DB Team.

During the inspection, GDOT, the CQAM, and the DB Team will jointly agree upon punch list items and an agreed date of correction of the items.

2.3.10     Quality Documentation

The DB Team shall establish and maintain an electronic and hard copy document control system to store, catalog, and retrieve all Project-related documents in a format that is approved for use by GDOT. Unless otherwise directed by GDOT, record retention shall comply with the requirements included in the Retention Schedules for State Government Paper and Electronic Records, and the State Agency Specific Schedules for Departments of Transportation, and they shall be provided to GDOT at the time of the expiration or earlier termination of the Agreement.

Design quality records shall be maintained by the DB Team in an auditable format according to the QMP procedures. GDOT has the right to audit the quality records for compliance with the QMP and the DBA requirements. Upon completion of the Project, the quality records shall be turned over to GDOT.

2.4     Safety and Security

The DB Team shall be responsible for the safety of its personnel and of the general public affected by the Project. See Section 2.2.4 regarding basic Safety Plan requirements.

This following defines the requirements to be incorporated into the Project and included in the Safety Plan in order to ensure that the Project is a safe and secure environment for all individuals working on the Project. The prevention of accidents during execution of the project shall be a primary concern of all participants, and shall be the responsibility of all levels of management. Safety shall never be sacrificed for production, but shall be considered an integral part of an efficient and quality Project.

Safety and security procedures shall include and/or address the following:

1. Safety and health standards to be adhered to
2. Roles and responsibilities of the safety/security staff
3. Contractors (meaning prime contractors and subcontractors combined) having a Safety Director and an accepted safety manual (or plan) available to all employees
4. Contractors holding periodic on-site safety meetings
5. Contractors conducting periodic on-site safety inspections

6. Contractors providing safety training for all new employees, and refresher training for all employees

7. Contractors conducting drug screening for all new hires

8. Contractors establishing daily housekeeping and clean-up procedures

9. Possible employee sharing of accident prevention savings

10. Having first-aid and medical kits readily available

11. Having a site security plan, possibly including such items as restricted parking near vulnerable structures, physical barriers (fences, barricades, etc.), coordinated efforts with local law enforcement officials during heightened threat levels, video surveillance, alarm systems, emergency telephones, etc.

12. Having an emergency preparedness and incident management plan, including roles and responsibilities, emergency evacuations, communications, first responder awareness training, and field drills

13. Establishment of an employee identification (ID) system

14. Level and frequency of audit and oversight safety/security reviews to be performed by GDOT, FHWA, independent consultants, and/or other agencies (as applicable)

15. Safety and security periodic reporting (no less than monthly)

In addition, appropriate threat and vulnerability assessments shall be made and taken into consideration thought the Project’s life cycle. The transportation elements of the Project could have a significant impact on regional safety and security plans.

2.4.1 Safety Management

The DB Team management has a responsibility to provide health and safety leadership, and promote and support a safe working environment. It is expected that all DB Team management and Contractors will support the DB Team’s safety department personnel in the implementation and enforcement of the Safety Plan program.

The DB Team shall designate a safety manager (“Safety Manager”) who shall be responsible for the development of the Safety Plan and the enforcement of safety and health policies, procedures, and work practices. The Safety Manager will provide Project direction to maintain a safe, healthy, and secure work environment for all employees, Contractors and the general public.

Field supervisors and managers shall be responsible for monitoring their direct hire employees and subcontractors to ensure that the work is being performed in a manner consistent with safety policies, procedures and work practices of the DB Team. They are responsible for promoting a safe, healthful and secure work environment for workers and
visitors that is free from violence, threats, harassment, and intimidation, and protects the general public from harm in connection with jobsite operations.

All workers are responsible for planning and completing all work in a safe manner by following all applicable policies, procedures, and safe work practices.

2.4.2 Worksite and Jobsite Analysis

The DB Team shall conduct and shall require of each contractor and subcontractor a job hazard analysis for each task to be performed at the beginning of each shift and whenever there is a change in the task or in the environmental conditions. The job hazard analysis shall solicit input from all members of the crew and shall be documented in writing.

2.4.3 Hazard Prevention and Personal Safety

The DB Team shall be responsible for the safety of its personnel and of the general public affected by the Project.

The prevention of accidents during execution of the Project shall be a primary concern of all participants, and shall be the responsibility of all levels of management. Safety shall never be sacrificed for production and shall be considered an integral part of an efficient and quality Project.

2.4.4 Training

The Safety Manager shall ensure that all personnel on the Project are provided a thorough safety orientation and periodic refreshers on the Project site safety requirements. The safety orientation shall include:

1. Roles and responsibilities
2. Hazard communications
3. Job hazard analysis
4. Reporting of incidents and accidents
5. Drug and alcohol policies
6. Driving policies
7. Disciplinary procedures
8. General health and safety requirements including proper usage of personal protective equipment (PPE)
9. General site safety rules

2.4.5 Incident and Emergency Management

The DB Team shall prepare (for GDOT review and comment) and implement plan(s) for responding to incidents and Project and Work emergencies. The plans shall identify
responsibilities and procedures for responding to incidents and emergencies, including coordination and cooperation with first responders in the performance of their normal duties.

The incident and emergency management plan(s) shall include:

1. The DB Team’s incident response team availability.
2. The DB Team’s incident response team training to effectively respond to accidents, incidents and emergencies.
3. Incident site security, including traffic control measures and eliminating hazards to other road users.
4. Debris clearing and site assessment for damage repair.
5. Reporting and evaluation protocol and procedures prior to the dispatch of the DB Team’s response crews or arrival of first responders.

### 2.5 Schedule Requirements

#### 2.5.1 General Schedule Requirements

The DB Team shall comply with the Critical Path Method (CPM) schedule requirements as defined in this Section 2.5 and as described by and within the terms defined in the publication *CPM in Construction Management*, latest edition, by James J. O’Brien and Fredric L. Plotnick. In case of discrepancy between the DB Documents and *CPM in Construction Management*, the DB Documents shall govern.

Project Schedule shall mean any of the following: Project Baseline Schedule, Revised Project Baseline Schedule, or Project Schedule Updates, as further defined in this Section 2.5 and as appropriate for the context in which they are used.

#### 2.5.2 Project Schedule Requirements

The Project Schedule shall include and illustrate all major Work activities that occur during the Project Term as required under the DB Documents in sufficient detail to monitor and evaluate design and construction progress and to denote changes that occur from commencement of the Work to Final Acceptance of the Work.

The Project Schedule shall define the timeframe for completion of the Project and achievement of all contractual milestones (the Project Baseline Schedule shall show Milestone Completion Deadlines no later than those specified in Exhibit 9). The Project Schedule shall indicate the order and interdependence of activities and the sequence for accomplishing the Work. The DB Team shall be responsible for ensuring that all Work sequences are logical and that the Project Schedule indicates their coordinated plan for performing the Work. Additional Project Schedule requirements are as follows:

1. Utilize a Work Breakdown Structure (WBS) and activity codes to plan, analyze, monitor, and record the progress of the Work. The DB Team shall coordinate with
GDOT prior to submittal of the Project Baseline Schedule to ensure an adequate WBS and activity codes have been developed and assigned to each activity to the satisfaction of GDOT. GDOT reserves the right to request additional WBS levels and activity codes be added and assigned throughout the Project.

2. Project Schedule activities shall be mapped to, organized by, and rolled-up to a deliverable-based, hierarchal WBS. The organization and breakdown of the WBS shall reflect the DB Team’s overall approach to the planning, scheduling, and execution of the Work and shall conform to all Project-specific phasing, staging, sequencing, design, and deliverable requirements. The first and second levels of the WBS shall be Project and Phase, respectively, where Phase is the level used to describe the Phase of Work (e.g., project management, design, Right of Way, Utility Adjustments, and construction). The design phase WBS shall identify each design package required for construction phasing and sequencing and shall identify each stage of the design. The DB Team shall further develop and detail the base WBS.

3. The Project Schedule shall include the following activity codes assigned to each activity: State (Georgia or South Carolina), Phase, Work Element (each bridge, retaining wall, noise wall, drainage run, etc.), Location (each mainline, crossing streets, and ramps and may be further defined by station-to-station sectioning), Work Type (environmental, roadway, drainage, structures (bridges, retaining walls, noise walls), landscaping, etc.) and Responsibility (party responsible for each activity). Activity codes assigned to activities shall be “Project” level only (i.e., not global). All activity code definitions shall include the PI number in the description (i.e. PI######_Phase; PI######_Responsibility; etc.).

4. Prepare as CPM graphic diagrams, computer generated, and utilizing the Precedence Diagram Method (PDM) that clearly delineates the relationships between Work activities.

5. Break the Work into discrete activities associated with only one operation and into sufficient detail to readily identify, evaluate, and measure planning, design, and construction progress. Activities shall be broken down minimally to Work elements (for example, bridges into foundations, substructure, superstructure, and decks; and by individual bents and spans with separate activities for formwork, rebar, concrete placements, and cure time). All Work shall be broken into similar manageable Work elements.

6. The Project Schedule shall use standard and consistent activity identification numbers and textual descriptions in a manner acceptable to GDOT. The coding structure shall be alphanumeric with no spaces, hyphens, symbols, or special characters in the activity identification numbers. Each activity shall have a unique activity identification number which shall not be modified or reassigned to different work activities once assigned to an activity. Each activity shall be uniquely named and consist of a verb, noun, and location. Physical locations of activities within definable geometric limits (e.g., from station to station, within a single ramp, etc.) shall be included in the activity description and consistent with the WBS.
7. Provide sufficient time for all submittals and re-submittal review times as required in the DB Documents and as described in Article 6.3.

8. Include activities for interfaces with other projects, localities, municipalities and other Governmental Entities.

9. Include all activities for Owner or other 3rd Party scopes of Work.

10. Include activities for the acquisition of any Proposed Right of Way (whether State Proposed/State Acquired or DB Team Proposed/DB Team Acquired) as applicable, as well as for any DB Team identified Additional Properties, Utility Adjustments, and permit acquisitions.

11. Activity durations shall be in whole calendar days with a maximum duration of twenty (20) Working Days (160 hours), and not less than one (1) day (8 hours), except for long-lead procurement activities or as otherwise stipulated in the DB Documents or unless approved prior by GDOT. Durations for each activity shall represent the anticipated work effort to complete the task and will reflect planned production rates. Project Schedule durations shall not conflict with any time or sequencing requirement in the DB Documents.

12. Divide the Work into activities with appropriate logic ties to show the DB Team’s overall approach to the planning, scheduling, and execution of the Work. This includes sufficient hard logic (a.k.a. construction logic) and sufficient preferential logic (a.k.a. trade flow or soft logic). Preferential logic shall include logic ties that dictate the planned flow of Work on an early date basis, as well as sufficient logic to ensure the late date basis represents a reasonable plan, production rates, and resource constraints that can be met. Resource constraints shall be explicitly identified using activity relationships and a detailed description in the narrative report.

13. All activities, except for the first and last, shall have a minimum of one predecessor activity and one successor activity. Each activity shall have at least one “start” predecessor (i.e. FS0d, SS0d) and one “finish” successor (i.e. FS0d, FF0d).

14. The majority of activity relationship types shall be finish-to-start (FS) with no leads or lags for construction phase activities. Finish-to-finish (FF) or start-to-start (SS) relationship types may contain lags no greater than one-half of the predecessor’s duration. Use of a start-to-finish relationship type is not permitted.

15. Relationship lags shall not be used when the creation of an activity will perform the same function (e.g., concrete cure time). Identify any lag proposed and provide an explanation in the narrative report for the purpose of the lag. Use of lags with a negative value are not allowed.

16. Show maintenance of traffic/closure or restriction periods, all non-Work periods, or any other time restrictions. Identify self-imposed and regulatory non-Work periods for environmental or other restrictions or concerns. The DB Team may constrain Work scheduling in these periods by using special calendars or other equally
effective means. Clearly identify such starts or completions imposed on the Project Schedule.

17. Utilize the Gregorian calendar and satisfactorily account for anticipated adverse weather. With submittal of the Project Baseline Schedule, provide in writing the planned methodology to account for anticipated adverse weather. This may be achieved via activity durations, calendar non-work days clearly defined for weather, or other equally effective means as approved by GDOT.

18. All calendars shall be Project-level. Do not use or reference global level calendars. Use of “Inherit holidays and exceptions from Global Calendar” option is not permitted.

19. Each calendar shall identify work days and non-work days and include identifiable PI# in the description (i.e. “PI######_5-day work week”). Each calendar utilized shall maintain the same hourly work/non-work times and same hours/day. All calendars shall maintain the same hours per time period as specified in software “Admin Settings” and that “Use assigned calendar to specify the number of work hours for each time period” is selected. Unless otherwise approved by GDOT, a standard working day consists of eight (8) work hours per day and be 8:00 AM to 5:00 PM (with a 1-hour, non-work lunch at 12:00 PM - 1:00 PM). Each calendar (5-day work week, 6-day work week, 7-day work week, etc.), shall remain consistent with these start and finish times.

20. Each start milestone will be constrained with a “start on-or-after” primary constraint date. For each Completion Deadline in Exhibit 9, use the following convention:

   (a) The applicable ending event is a finish milestone identified as “Completion Deadline ______”, constrained with a “Finish On” Primary Constraint date (where the underlined identifies the applicable Milestone Schedule Deadline).

   (b) Activity “Completion Deadline ______” shall have sole predecessor identified as a finish milestone named “Currently Forecasted Completion Date ______” tied with a finish-finish relationship with zero lag value. Both activities shall be assigned to the same Calendar.

   (c) Activity “Currently Forecasted Completion Date ______” shall have as predecessors all the activities that must be completed prior to the Milestone Schedule Deadline.

21. Date constraints, other than those required by the DB Documents, will not be allowed unless approved prior in writing by GDOT. Identify any proposed constraints and provide an explanation for their purpose. Do not use “As late as possible,” project level “Must finish by,” and “Mandatory” constraint types.

22. Any and all methods utilized to sequester float calculations are prohibited. Project Schedules showing an early Completion Date shall consider the time between the Completion Date and the applicable Completion Deadline as Project float.
23. The data date for the Project Baseline Schedule shall be the date of NTP 1. The data date for Project Schedule submittals, excepting the Project Baseline Schedule, shall be set to the day immediately following close of the update period, so that if the period closes on the 31st at 11:59 p.m., the data date shall be set to the 1st of the next month at 12:00 a.m.

24. Regularly update the Project Schedule for actual (not calculated) progress through the data date and recalculate utilizing the retained logic method. Revise, adjust, and recalculate Project Schedules to represent the current plan to complete the Work with no out-of-sequence progress activities.

25. Contemporaneously and accurately memorialize progress, including actual start, actual finish, and physical percent complete (manually input) for activities progressed as of the data date. Actual dates inputted shall be limited to the active update period. Previously statused start and finish dates shall not be revised without prior written acceptance from GDOT.

26. Forecast remaining dates for all in-progress activities utilizing accurate physical percent complete and updated remaining duration. Use of expected finish dates for in-progress or not-started activities is not permitted. Reforecast early dates and recalculate late dates for all remaining activities.

27. Scheduling data shall not be automatically updated by default mechanisms which may be included in the scheduling software system.

28. For interruptions after an activity has begun, add a separate activity so that the original activity is split into two activities. Mark the original activity as completed. The new activity shall have a FS relationship with the original activity and retain all existing successor relationships.

29. Do not delete any activities after the Project Baseline Schedule is approved. If an activity’s scope is eliminated, revise the description to include “- scope deleted,” reduce the duration to zero (0) days, remove logic, and contemporaneously actualize dates to the day immediately preceding the data date.

30. Maintain unique activity identification number, name, and scope, which shall not be modified or reassigned. Activity identification numbers can only be used once. Do not revise activity descriptions to represent different scope than originally intended.

31. If additional activities are incorporated to supplement or replace the scope of a single activity, the existing activity shall maintain its activity ID and be converted to a level of effort summary activity that spans the newly added detailed activities.

32. Do not change an activity’s calendar assignment, modify a calendar’s work/non-work periods (work days or work hours/day), or add or delete calendars used in the Project Baseline Schedule without prior GDOT agreement.

33. Incorporate changes to the Work upon authorization of a Supplemental Agreement. Include the Supplemental Agreement number in the activity description or as approved by GDOT and describe the new activity scope in the
narrative for the reporting period in which the Supplemental Agreement was executed.

34. When asserting that a Relief Event has occurred, provide supporting evidence including a time impact analysis (TIA). Use the then-current Project Schedule Update at the time the asserted event occurred. Include a calendar time-scaled CPM network schedule (“fragnet”) analysis with supporting reports depicting the time impact basis of the request with the affected Project areas highlighted. Upon issuance of a Supplemental Agreement, or as otherwise directed in writing by GDOT, the DB Team shall incorporate the delay “fragnet” into the latest Project Schedule.

2.5.3 Project Schedule Submittal Requirements

All Project Schedule submittals shall be provided and reviewed in accordance with timing requirements and durations specified in Volume 2, Table 3-1. GDOT shall review Project Baseline Schedules and Revised Project Baseline Schedules and return them as approved, approved with comments, or returned to be revised and resubmitted. Project Schedule Updates will be accepted, accepted with comments, or returned to be revised and resubmitted.

All Project Schedule submittal(s) shall include:

1. Electronic Primavera P6 file format (.XER or .XML) of the schedule submittal
2. A full schedule plot (in PDF format)
3. A critical path schedule plot (in PDF format)
4. A narrative report (in PDF or MS Word file format) meeting the requirements of this Section 2.5

The DB Team shall update on a monthly basis the previously approved or accepted Project Schedule to accurately reflect the current status of the Project and any accepted Relief Events by GDOT. In addition to the above, provide Five-Week Detail Schedules in accordance with Section 2.5.5. GDOT may withhold payment until Project Schedule Updates are submitted.

A Revised Project Baseline Schedule submittal may be required if there are substantial changes to the following: Work sequencing, field conditions, changes due to Supplemental Agreements, if any Completion Date is more than thirty (30) days past a Completion Deadline, or if otherwise requested by GDOT. Once a Revised Project Baseline Schedule is approved by GDOT, it shall be used as the basis for subsequent Project Schedule Updates.

2.5.4 Narrative Report Requirements

Each Project Schedule submittal shall include a separate narrative report meeting the requirements of this Section 2.5.4 and as specified throughout Section 2.5 and Section 2.6. The narrative report shall be updated with each Project Schedule submittal and pertain to the Work identified in the particular Project Schedule submittal.
The narrative report for Project Baseline Schedule submittals shall include the following, separated into sections:

1. An explanation of the overall plan to complete the Project, including where the Work will begin and how the Work and crews will progress through the Project.

2. An explanation of the use and application of the workdays per week, number of shifts per day, number of hours per shift, holidays observed and how the Project Schedule accommodates anticipated weather days for each month. Submit a list of the calendars used and definition of their type.

3. A description of the Work to be completed each season (for multi-year projects).

4. A description of the critical path.

5. An explanation of the use of any allowed constraints, including the reason and purpose for each constraint.

6. A statement describing the status of any required permits.

7. Include the Construction Phasing Plan and Submittals Schedule.

In addition to the above, the narrative report for Project Schedule Update submittals shall include the following:

1. A description of the work performed since the last approved or accepted Project Schedule. If the work performed does not match the work scheduled to be performed, the DB Team shall include a detailed description of why there is a discrepancy between the activities that should have been completed or progressed as indicated in the latest approved or accepted Project Schedule submittal.

2. A description of the status of the forecasted Completion Dates relative to each required Completion Deadline. Address any changes since the latest approved or accepted Project Schedule submittal and provide an explanation if any forecasted Completion Dates are projected to occur after the required Completion Deadlines.

3. A description of any problems encountered or anticipated since the latest approved or accepted Project Schedule submittal, inclusive of any unusual labor, shift, equipment or material conditions or restrictions encountered.

4. A description stating the dates which the DB Team could not work on activities identified on the critical path due to weather. If there were no weather delays experienced during the previous month the letter should state as such. Any such statements regarding weather delays report does not constitute notice in accordance with Articles 13 and 14 of the DBA.

5. A statement that identifies any current and anticipated delays. The statement should include identification of the delayed activity, the type of delay, the cause of the delay, the effect of the delay on other activities and Completion Dates and identification of actions required to mitigate the delay. A discussion of delays in the narrative report does not constitute notice in accordance with Articles 13 and 14 of the DBA.

6. Update the Construction Phasing Plan and Submittals Schedule.
The narrative report for Revised Project Baseline Schedule submittals shall also include a detailed description of the proposed changes to the latest approved or accepted Project Schedule with justification for the changes, including the following:

1. Changes or delay in any Completion Dates since the latest approved or accepted Project Schedule submittal
2. Changes to the critical path
3. Changes to activity original durations
4. Changes to activity relationships and/or schedule logic
5. Identification of activities that have been added, deleted, or modified

2.5.5 Five-Week Detail Schedules

Submit a Five-Week Detail Schedule on the same day every week in which Construction Work occurs. The Five-Week Detail Schedule is a rolling period of at least four (4) weeks ahead for planned activities and one (1) week back (recording actual dates and durations for Work performed). The Five-Week Detail Schedule shall:

1. Be based on the current Project Schedule Update and provide a more detailed greater breakdown of the schedule activities for the purpose of coordination of the Work, oversight planning, verification of Work completed, and materials inspection and testing;
2. Align accurately with and be derived from the current Project Schedule with any deviations clearly noted and explained; and
3. Reference the applicable Project Schedule activity identification numbers and define subsequent specific daily operations for all Work activities scheduled to be performed during the look-ahead period.

2.5.6 Additional Software Requirements

The DB Team shall utilize the latest available version of Primavera P6 software for the development and maintenance of all Project Schedules. Provide Project Schedules in electronic Primavera P6 file format (.XER or .XML) compatible with software version utilized by GDOT. The DB Team shall coordinate with GDOT to ensure all Project-related Primavera P6 data is properly imported with each Project Schedule submittal. This includes which import configuration options will be utilized. Unless otherwise agreed to in writing by GDOT, the following data types will NOT be imported or considered for purposes of review, approval or acceptance by GDOT: Resource Codes, Resource Code Values, Shift Names, Work Products and Documents, Relationships to External Projects, Project Funding Assignments, Issues, Project Code Assignments, Thresholds, Activity Steps, Timesheets, Risks, High Level Planning Assignments and Project Budget data (Budget Log, Spending Plans, Funding Sources, and Current Budget), User Defined Fields (UDF’s), Notebooks, Activity Discussion and Feedback tabs.

Except as noted in this Section 2.5, the DB Team shall ensure all Project Schedules comply with the following software settings and defaults.
2.5.6.1 Software Admin Settings

Apply the following Primavera P6 software Admin Settings:

1. Industry to use for terminology and default calculation settings in the P6 Professional module shall be “Engineering and Construction.”
2. Currency shall be “USD – Dollar.”
3. Time Periods shall be defined as follows: 8.0 Hours/Day; 40.0 Hours/Week: 172.0 Hours/Month; and 2000.0 Hours/Year.
4. Select “Use assigned calendar to specify the number of work hours for each time period.”
5. Earned Value Technique for computing performance percent complete shall be “Activity % Complete.”
6. Technique for computing estimate to complete (ETC) shall be “ETC = Remaining Cost for activity.”
7. When calculating earned value, use “Planned values with Current Dates” or “At Completion values with Current Dates” options. “Planned Values with Planned Dates” option is not permissible.

2.5.6.2 Project Settings and Defaults

Apply the following Project settings and defaults:

1. Each Project Schedule submittal shall be clearly identified; have a unique Project ID, and Project name prior to submission (prior to starting the export process). Project status shall be “Active.”
2. Project level “Must Finish By” shall be left blank.
3. The character for separating code fields for the WBS tree shall be “.”
4. The fiscal year begins on the 1st day of July.
5. The baseline for earned value calculations shall be “Project baseline.”
6. Critical Activities shall be defined as “Longest Path.”

2.5.6.3 Activity Settings and Defaults

Apply and ensure all schedule activities conform to the following:

1. The duration type shall be “Fixed Duration and Units”; start and finish milestones shall be “Fixed Duration and Units/Time.”
2. The percent complete type shall be “Physical.”
3. Activity Type shall be set to “Task Dependent” except for Milestones and Level of Effort/Summary activities.
4. The default calendar shall be set to most common Project-specific production calendar. Calendar assignments may be changed at the activity level, as applicable.

5. Default price/unit for activities without resource or role price/units shall be “$0.00/h.”

6. “Activity percent complete based on activity steps” shall not be selected.

7. “Link Budget and At Completion for not started activities” shall be selected.

8. “Reset Remaining Duration and Units to Original” shall be selected.

**2.5.6.4 WBS Default Settings**

Apply the following WBS Default Settings:

1. Status for all WBS levels with activities assigned shall be “Active.”

2. Technique for computing performance percent complete shall be “Activity percent complete”. Do not check “Use resource curves / future period buckets.”

3. Technique for computing Estimate to Complete (ETC) shall be “ETC = remaining cost for activity.”

**2.5.6.5 Software Schedule Options**

Under Primavera P6 Tools, Schedule, apply the following Options:

1. Check “Ignore relationships to and from other projects.”

2. Uncheck “Make open-ended activities critical.”

3. Uncheck “Use Expected Finish Dates.”

4. Uncheck “Schedule automatically when a change affects dates.”

5. Uncheck “Level resources during scheduling.”

6. Uncheck “Recalculate assignment costs after scheduling.”

7. When scheduling progressed activities use “Retained Logic.”

8. Calculate start-to-start lag from “Early Start.”

9. Define critical activities as “Longest Path.”

10. Calculate float based on finish date of “Each project.”

11. Compute Total Float as “Finish Float = Late Finish - Early Finish.”

12. Calendar for scheduling Relationship Lag use “Predecessor Activity Calendar” or specify with the Project Baseline Schedule if lags are to be calculated on predecessor, successor, or 24-hour calendar, and do not change in future Project Schedules.
2.6 Progress, Payment Requests, and Payment

These payment provisions are subject to GDOT Standard Specifications, Construction of Transportation Systems 2013 Section 109.03 to the extent that they do not contradict the requirements of this Section 2.6.

Except as specifically provided elsewhere in the DB Documents, no payment will be made until the Project SOV is approved by GDOT.

In no event shall the DB Team include in any Payment Request amount any request for payment on account of Work performed by any Contractor or Subcontractor that shall not be remitted to such parties in accordance with the terms of the DB Documents and applicable Law.

In no event shall either the DB Team or any Contractor or Subcontractor withhold or impose retainage on any Subcontractor or Supplier, or any downstream sub-subcontractors or suppliers of any tier. The DB Team shall provide GDOT with details regarding the withholding or deduction of any payments to Contractors or Subcontractors, including specificity as to amounts and the basis for such withholding or deductions and if any such Contractors or Subcontractors are included within the DB Team’s DBE Performance Plan.

2.6.1 Schedule of Values (SOV)

Schedule of Values (SOV) means a detailed line item valuation for all Elements of the Work which lists all Payment Activities in a format that provides a sufficiently detailed breakdown of the Pay items. Include with the Schedule of Values a rational basis for partial payments of the Lump Sum bid based on the completed portion of the item and definitive activities. Payment will not be made for individual construction activities. No payments will be made until the Schedule of Values is accepted. Mobilization, and Payment and Performance Bonds may be included as separate line items in the Schedule of Values. Any amount for Mobilization set forth in the Schedule of Values shall not exceed 2.5% of the total construction cost.

2.6.1.1 Proposal SOV

Subject to GDOT’s approval, DB Team shall be paid for authorized Work performed during the first ninety (90) days from NTP 1 based on the Proposal SOV. Payment Requests shall include a detailed list of Payment Activities, in accordance with Section 2.6.1.3, as well as progress percent completed to date, prior percent completed, percentage remaining, and the associated dollar amount to justify the amounts requested.

After ninety (90) days, no further payment will be made until the Project SOV is approved by GDOT and progressed for the period in which the DB Team intends to be paid.

For General Conditions Payment Activities, payment will be made based upon the approved amount allocated for that month.
2.6.1.2 Establishing the Project SOV

The Project SOV shall be based upon the Form F of the Proposal (Exhibit 2), which line items for Georgia Work and South Carolina Work shall be further broken out in to Payment Activities.

The Project SOV shall be submitted and will be reviewed by GDOT for approval per requirements set forth in Volume 2, Table 3-1. The Project SOV (shown in Exhibit 2), shall incorporate the Proposal SOV and further detail all Work for which the DB Team intends to be paid, subject to the requirements of these Sections 2.6.1.1 through 2.6.1.4, and as approved by GDOT.

The sum of the costs of all Project SOV Payment Activities shall equal the Contract Sum. The approved Project SOV shall be used as the mechanism for determining progress payments on a percent-complete basis.

2.6.1.3 Project SOV Payment Activities

The Payment Activities must be reasonably associated with, and supported by the activities as represented by Project Schedule.

The Payment Activities in the Project SOV shall meet the following criteria:

1. Payment Activities shall each have a unique description including a noun, verb, and location information.
2. Payment Activities cannot be front-loaded.
3. No Payment Activity shall be greater in price than $250,000 without prior GDOT approval.
4. Once approved, Payment Activities cannot be modified in name or amount without prior GDOT approval.
5. The cost for each Payment Activity shall accurately represent the value of the Work identified for the activity.

The Project SOV shall include Final Completion Activities sufficient to cover all efforts necessary to fulfill all DB Document requirements and successfully complete the Work for the following activities:

1. Record Drawings (As-Built) Submittal, which shall be equal to no less than 0.1% of the Contract Sum.
2. Completion of punch list items, which shall be equal to no less than 0.5% of the Contract Sum.
3. Final Close-out, which shall be equal to no less than 0.2% of the Contract Sum.
4. Demobilization, which shall be equal to no less than 0.2% of the Contract Sum.
2.6.1.4 Project SOV Updates

Each progressed Project SOV shall be accompanied by a Project Schedule Update submittal. The DB Team and GDOT will agree upon the progress percent complete for Work in place related to each Project SOV Payment Activity. The Payment Activities must be reasonably associated with, and supported by the activity status information as represented by corresponding Project Schedule Update.

The progressed Project SOV shall be submitted with and shall justify the DB Team’s monthly Payment Requests. The Project SOV shall show for each Payment Activity, individually and in aggregate: SOV Payment Activity, progress percent completed to date, prior percent completed, percentage remaining, and the associated dollar amount.

For the General Conditions Payment Activity, pay for each month the amount allocated for General Conditions multiplied the total percentage of the work completed for that reporting period.

Supplemental Agreements that include changes to the Contract Sum will be incorporated into the Project SOV.

2.6.2 Draft Payment Request

The DB Team shall submit a draft Payment Request to GDOT containing the amount asserted to be payable for each SOV line item and amounts due under approved Supplemental Agreements. The draft Payment Request, lien release, and certification shall be submitted on forms provided or approved by GDOT which approval shall be prior to the Payment Request Review Meeting.

Upon receipt of a draft Payment Request, GDOT will review the submitted Payment Request and provide comments to the DB Team that lists any discrepancies and other amounts intended to be deducted.

2.6.3 Payment Request Review Meeting

The DB Team shall schedule and hold a Payment Request review and progress status meeting with GDOT after submitting a draft Payment Request and prior to submitting a final Payment Request each month. The Payment Request review meeting is to obtain GDOT’s comments or the changes necessary to the draft Payment Request to allow a final Payment Request to be submitted by the DB Team. The meeting shall address and finalize the status of the following:

1. For each schedule Payment Activity with progress: actual start date, actual finish date, and percent complete.
2. Incorporation of and summary list of all Supplemental Agreements.
3. Each Payment Activity which includes Nonconforming Work.
4. Any other payment requested, such as for mobilization, insurance and bonding, or unincorporated materials.
2.6.4 Payment Request Approval and Processing

The DB Team shall submit a final Payment Request to GDOT by the fifth (5) day of each month, containing the amount asserted to be payable for each Payment Activity and amounts due under approved Supplemental Agreements. The final Payment Request will address all comments provided by GDOT to the DB Team at the Payment Request review meeting.

Payment Request shall be submitted both electronically and in hardcopy format using forms provided by GDOT, and shall include supporting documentation for the amount claimed payable when requested by GDOT.

GDOT will review the Payment Request within five (5) days of receipt from the DB Team. If GDOT disagrees with the amounts requested or unresolved items remain, The DB Team shall submit a revised Payment Request to address any outstanding issues identified by GDOT. If the DB Team includes items for payment that remain unresolved, GDOT will either: i) notify the DB Team that unresolved items in the Payment Request remain, and request a resubmittal of a revised Payment Request; or ii) deduct those amounts GDOT asserts are not eligible for payment, and process the Payment Request. In such case, GDOT shall notify the DB Team of any such deductions.

2.6.5 Documents Required to be Provided with the Payment Request

The following documents shall be submitted with each final Payment Request application. No Payment Request will be processed without such documents properly completed, signed, and dated:

1. Project SOV progressed through the month for which payment is being requested.
2. Project Schedule Update progressed through the month for which payment is being requested, along with a schedule narrative.
3. All required insurance certificates.
4. Any other document or submittal required by the DB Documents to be provided.

2.6.6 Limitations on Progress Payments

GDOT will not pay for Work unless the following conditions are met with respect to such Work:

1. Accepted Released for Construction Documents are on Site and design documentation has been maintained for the Work being performed and for which payment is being requested;
2. Nonconforming Work Items are corrected and/or resolved to the satisfaction of GDOT for Payment Activities that are asserted as complete.
3. For on-going administrative activities, payment shall be made for the amount apportioned for the reporting period in which payment is being requested.
4. Payments for activities shall not be fully paid (100% of the budgeted amount) until that portion of the Work is completed and all applicable required documentation is received and accepted by GDOT.

5. The amount payable to the DB Team for insurance and bond premiums will be their actual cost, which will be paid (reimbursed) upon proof of payment by the DB Team. Where an activity requires submittal of a bond, the activity is complete when the bond has been provided in the amount and under the terms required in the Agreement.

On any Payment Request, GDOT may suspend or deduct amounts otherwise due to the DB Team for that period’s apportionment for any of the items identified in Exhibit 18 of the Agreement.

If the DB Team fails to completely prosecute Work or correct Nonconforming Work for which that Payment Activity was paid in full, GDOT may deduct amounts from the next successive month for that Work.

2.6.7 Price Reductions for Nonconforming Work

Nonconforming Work, if accepted by GDOT, will result in reductions of the Contract Sum as specified below.

Where provided, unit prices for reductions may be applied by GDOT, including pay factors, daily deductions, and rejection values identified in the GDOT Standard Specifications relating to price reductions.

Amounts for reductions per unit of Nonconforming Work allowed to remain in place by GDOT not covered by GDOT Standard Specifications shall be determined by GDOT. The DB Team shall be provided the opportunity to either accept a reduction offered by GDOT or to remove and replace the Nonconforming Work at no additional cost to GDOT. Girder defects will be assessed for price reductions based on long-term durability and maintenance concerns.

2.6.8 Other Deductions

GDOT may deduct from any amounts otherwise owing to the DB Team, including for each monthly progress payment and the final payment, the following:

1. Any anticipated or accrued losses, liability, liquidated damages, fees, or other damages for which the DB Team is responsible.

2. The estimated or actual cost, as determined by GDOT, of remedying any Nonconforming Work or otherwise remedying any breach of contract by the DB Team.

3. The amount of any outstanding claim relating to the Work.

4. The estimated amount, as determined by GDOT, or the amount identified in the Project SOV for Work that the DB Team is obligated to perform under the Contract that the DB Team has failed to perform, whichever is greater.
5. Any other sums which GDOT is entitled to recover from the DB Team under the terms of the Contract.

6. With regard to final payment, in addition to the above, the amount GDOT deems advisable to retain to cover any existing or threatened Disputes, Claims, Liens and stop notices relating to the Project, or the cost of any uncompleted Work (including uncompleted Warranty Work).

GDOT’s failure to deduct from a progress payment or final payment any amount that GDOT is entitled to recover from the DB Team under the Contract shall not constitute a waiver of GDOT’s right to such amounts.

2.6.9 Processing and Payment

Once GDOT reviews and approves a final or revised Payment Request acceptable to GDOT and in accordance with Section 2.6.4, GDOT will sign and date and return a copy of the Payment Request cover sheet with any corrections noted and proceed with processing the Payment Request.

2.6.10 Prompt Payment to Contractors and Subcontractors

Upon receipt of payment, the DB Team shall promptly pay all Contractors out of the amount paid to the DB Team on account of the respective Work performed by such Contractors as and to the extent that such Contractors are entitled to same under the respective Contracts and applicable law. The DB Team shall require Contractors by appropriate agreement with the Subcontractors to require all such Subcontractors to make payments to all downstream sub-subcontractors and suppliers in a similar manner. GDOT shall have no obligation to pay or to see to the payment of money to the Contractors or Subcontractors, except as may otherwise be required by Law, provided however, that GDOT reserves the right to make payments to the DB Team and jointly payable to any such parties where the DB Team has failed to remit payments properly due and as required.

2.6.11 Application for Final Payment

Final payment will be made in accordance with Section 2.6.12.

On or about the date of delivery of GDOT’s issuance of the certificate of Final Acceptance, the DB Team shall prepare and submit an application for Final Payment to GDOT showing the proposed total amount due the DB Team. In addition to meeting all other requirements for invoices hereunder, the application for Final Payment shall include (i) the executed release and affidavit described below; (ii) a list of any asserted, outstanding, or pending Relief Events or Compensation Events and all existing or asserted claims, liens, and stop notices by Subcontractors, laborers, Utility Owners, or other third parties relating to the Project, including any notices filed or to be filed with the Affidavit of Final Completion, stating the amount at issue associated with each such notice; (iii) the written consent by the Surety to such payment; and (iv) such other documentation as GDOT may reasonably require.
GDOT will review the DB Team’s proposed application for Final Payment, and changes or corrections will be forwarded to the DB Team for correction. If no changes or corrections are required, GDOT will approve the Application for Final Payment.

2.6.12 Final Payment

As a condition to its obligation to make payment to the DB Team based on the application for Final Payment, GDOT shall have received an executed release from the DB Team, releasing and waiving any claims against the Indemnified Parties, excluding only those matters identified in any asserted, outstanding, or pending Relief Event or Compensation Event Notices listed as outstanding in the application for Final Payment, and otherwise satisfactory in form and content to GDOT.

The executed release shall be accompanied by an affidavit from the DB Team certifying the following:

1. All Work has been performed in strict accordance with the requirements of the Contract Documents.

2. The DB Team has resolved any claims made by Subcontractors, Suppliers, Utility Owners, laborers, and others against the DB Team, GDOT, or the Project, except for those claims identified in the Application for Final Payment or those claims for which the Subcontractor has executed a release against GDOT, the Project, and the Payment Bond.

3. The DB Team has followed GDOT’s procedures for Final Acceptance and has provided complete lien releases from all Subcontractors and Suppliers, except for those with claims listed above, in a form and with language provided by GDOT.

4. The DB Team has no reason to believe that any Person has a valid claim against the DB Team, GDOT, or the Project that has not been communicated in writing by the DB Team to GDOT as of the date of the certificate.

All prior partial estimates and payments shall be subject to correction in the final payment.

The executed release and the affidavit shall survive final payment. The payment amount will be reduced by any amounts deductible under these DB Documents.

The DB Team’s acceptance of final payment shall constitute a waiver of affirmative claims by the DB Team, except such claims previously made in writing and identified in writing as outstanding and unsettled at the time of the application for Final Payment.

2.6.13 No Waiver

No payments shall be construed as an acceptance of any defective work or improper materials nor shall any such payments be conclusive evidence of the performance of this Agreement.
2.7 Public Information and Communications

2.7.1 General Requirements

It is vital to the success of the Project that GDOT and the DB Team gain and maintain public awareness and support. This shall be accomplished through proactive communication of Project information to all Project Stakeholders in a timely manner, providing advanced notification of potential impacts, allowing meaningful opportunities for stakeholders to identify issues and recommend solutions, facilitating timely and appropriate feedback from GDOT, and supporting the execution of a high-quality, well-executed communications plan to keep stakeholders informed, engaged, and educated. The DB Team shall coordinate with GDOT on items necessary to comply with GDOT’s adopted Public Information Policy Manual.

This Section 2.7 describes the requirements with which the DB Team shall comply during the Term of the Agreement regarding the provision of information and communication with GDOT to facilitate outreach and education to Project Stakeholders.

2.7.1.1 Public and Stakeholder Meetings

When requested by GDOT, the DB Team shall participate and provide necessary staff support in meetings with the public arranged and conducted by GDOT. During such meetings, the DB Team shall be in attendance to assist GDOT in providing the public with an update on the progress the Project and discussing key issues as they emerge, or as requested by GDOT.

The DB Team’s Project Information Coordinator (PIC) shall assist in implementing public and stakeholder meetings by performing the following responsibilities:

- Conduct media and other stakeholder group tours of the Project, as requested.
- Upon request and with GDOT’s acceptance, the PIC and other DB Team members shall attend meetings with key elected officials, the general public, representatives of civic organizations, businesses, and special interest groups within the Project corridor (individually or in groups) for the purpose of informing and building rapport with affected Project stakeholders.
- Support GDOT in the planning and implementation of public meetings, stakeholder working group meetings, and public outreach presentations to inform stakeholders and the public of construction plans and detours. Support shall include, but not be limited to, attendance of PIC and other SME’s at meetings, upon request.

2.7.2 Administrative Requirements

2.7.2.1 Public Information and Communications Plan

The DB Team shall support the execution of an approved Public Information and Communications Plan (PICP) under GDOT supervision that includes stakeholder involvement and public information strategies to engage and inform key stakeholders.
The DB Team will provide input and content to the comprehensive PICP. The PICP shall include detailed strategies and action steps to inform, educate, and engage Project Stakeholders throughout every Project phase. The DB Team shall provide input into an Emergency Event Communications plan that outlines guidelines for communications protocol, roles and responsibilities, specific activities, and timelines to adhere to during emergency situations. The DB Team shall coordinate and collaborate with GDOT on the development of the PICP. The DB Team shall also comply with the PICP throughout the Term of the Agreement. The PICP will also include a Project-specific stakeholder list that will be developed, maintained, and updated by the DB Team throughout design and construction activities to ensure that all interested and affected Project Stakeholders will be notified about meetings and Project updates. Additionally, the PICP will include a general schedule of public information activities for the Project over the entire Term of the Agreement.

The PICP will be flexible, to capture the full magnitude of yet-to-be-determined impacts as a result of Project activities such as design, construction, and the public’s reaction to these and other impacts. The PICP will also be resilient, to successfully guide the implementation of the outlined strategies, given the ever-changing desire for depth, breadth, and frequency of information by a variety of Project Stakeholders such as the media, elected officials, transportation stakeholders, and the general public. The DB Team shall coordinate with GDOT throughout the Project to ensure information is shared in a timely manner and effective resources are allocated for outreach needs.

The PICP shall provide a protocol for communicating with Project Stakeholders in coordination with GDOT. GDOT will approve all Project Stakeholder communications. GDOT and the DB Team will share responsibilities for disseminating information to the public, as specified in the PICP.

The PICP shall detail the communication hierarchy for information distribution related to compliance with approved Environmental Documents, as described in Section 4 (Environmental). The PICP shall also include names and contact information, including Emergency contact information, and the preferred methods of both routine and Emergency communications distribution. The DB Team shall ensure that any changes to contact information pertaining to the CEPP are incorporated into the PICP within five (5) Business days.

2.7.3 Project Information Coordinator (PIC)

The DB Team shall designate a member of the Project team or subconsultant team to carry out the role of the Public Information Coordinator (PIC), who will lead the DB Team’s responsibility for public information and involvement activities on a day-to-day basis throughout the Term of the Agreement until Final Acceptance. The PIC should be proficient in Microsoft Word, PowerPoint and InDesign or similar graphic design software. Relevant communications experience is preferred. The PIC or another member of the DB Team familiar with the PICP shall be available 24 hours a day, seven (7) days a week.

PIC responsibilities shall include coordinating with GDOT to facilitate communication between the DB Team, GDOT personnel (including GDOT’s communications officers),
and Project Stakeholders. Responsibilities shall also include interacting with affected stakeholders and representing the interests of the Project at public meetings and other formal and informal outreach events, upon GDOT request.

The PIC shall assist GDOT by performing the following responsibilities to implement the PICP:

1. Notify GDOT no less than twenty-one (21) days in advance of the start of any construction activity that will impact the general public such as any changes in traffic patterns to the existing general purpose lanes or existing transportation facilities so that GDOT can communicate the potential impacts of these activities with all Project Stakeholders to include the general public, the media, and adjacent Government Entities.

2. Disseminate Project Public Information materials in community locations specified in the PICP or as requested by GDOT.

3. Be available to answer questions via a direct telephone number, U.S. mail, email, and in person during normal business hours and Emergency situations. If the PIC is unavailable, these duties shall be fulfilled by another designated member of the DB Team as defined in the PICP.

4. Maintain an electronic database to document public inquiries and complaints including, at a minimum, the complaint, the response, and the date the complaint was resolved. The PIC will make this information available to GDOT at a frequency defined in the PICP and upon request.

5. Participate, as requested, in communication with Project Stakeholders and GDOT.

6. Provide supportive information for media and citizen inquiries when requested by GDOT.

7. Staff Project outreach events upon request from GDOT.

8. Provide GDOT with information, maps and print or digital graphics on Project status, traffic impacts and other information for communicating to key stakeholder groups and the general public. Information may be communicated using channels including email, text, a GDOT-hosted Project webpage, outreach presentations, newsletters, public meetings, video, and social media.

2.7.4   Monthly Public Information and Communications Reporting

The DB Team shall provide a monthly Public Information and Communication Report to GDOT. The report shall include, but not be limited to, the following information:

1. Environmental, design, and construction issues affecting adjacent residential areas, frontage roads, local streets, and utilities, grading, drainage, and noise, retaining walls, lane closures, ramp closures, local road closures and traffic shifts (changes in any use of exiting traffic);

2. Street and roadway detour design and implementation;

3. Scheduling and duration of work, including hours of construction;
4. Haul routes;
5. Methods to minimize noise and dust;
6. Environmental mitigation measures;
7. Number of public inquiries and complaints received, including an attachment of details and resolution;
8. Number of safety or emergency incidents, if any; and
9. Thirty (30)-day look ahead of anticipated construction activities.

2.7.5 Emergency Event Communications

For all Emergency events, such as vehicle collisions, ice/snow conditions, flooding, Hazardous Material spills, construction failures or injuries, Force Majeure Events, or other unforeseen events, the PIC shall take timely and appropriate action to inform GDOT of all pertinent details. The PIC shall provide these details through the agreed-upon protocol to ensure effective and timely communication to GDOT representatives who will, in turn, inform the media, elected and local officials, and all key stakeholders.

As indicated in Section 2.7.2, the DB Team shall provide input into an Emergency Response plan in collaboration with GDOT, to define communications protocol in Emergency situations. This plan shall include a twenty-four (24) hour contact list and protocol (hierarchy of team notification) for all of the Project team members including the local Emergency response members adjacent to the Project, counties, municipalities, utility companies with facilities within Project limits and FHWA. Notification tools include: overhead changeable message signs (CMS), temporary changeable message signs, GDOT’s web-based information tool, email/web alerts, telephone notification, texts, facsimiles, and media releases/interviews, as appropriate. The DB Team shall continue to provide updated information, as available and on a timely basis, until the Emergency has been resolved.

In the event of an unforeseen Emergency, timely notification shall occur as soon as practicable, but no longer than fifteen (15) minutes from of the start of the occurrence. If advance warning is available for an Emergency event such as ice/snow, timely notification shall mean as soon as practicable, but no more than fifteen (15) minutes from the time the information was made available. In both situations, the DB Team shall continue to provide updated information to GDOT, as available and on a timely basis, until the Emergency has been resolved.

2.7.6 Disseminating Public Information

The PIC and the DB Team shall assist GDOT in the development of and review of public information materials. Activities shall include:

1. The PIC and the DB Team shall assist in the review of materials regarding Project-related subjects, for use in meetings, news releases, telephone correspondence, newsletters, email, GDOT’s web based information tool, overhead dynamic and changeable message board signs, web alerts, maps, displays, renderings,
presentations, digital renderings/animations, photos, brochures, pamphlets, and any other relevant public information materials.

2. The PIC and the DB Team shall provide weekly Traffic Interruption Request summaries for public information purposes. The PIC will provide draft press releases and detour maps of planned impacts to affected stakeholders or the traveling public. The DB Team shall provide to the PIC any lane closure and detour requirements 72 hours in advance of closure and detour activities.

3. The PIC shall provide narrative content, photos and graphic information for weekly social media posts and monthly Project e-newsletters.

4. The PIC and the DB Team shall support the planning and implementation of special events including a groundbreaking ceremony at commencement of construction and ribbon cutting at Project completion.

5. The DB Team shall supply high-quality construction progress photos and video (detail images and aerial) monthly and at major construction milestones.

6. The DB Team also shall assist in the development of Project-related information for the GDOT Project website, including:
   a. Narrative Project updates
   b. Project maps
   c. Digital renderings and/or animations
   d. Frequently asked questions (FAQs)
   e. Current Project activities addressing design and construction
   f. Timing of road and ramp closures and openings
   g. Any utility disruptions
   h. Recommended route alternatives during closures

2.7.7 Public Involvement Action Items

Table 2-2 summarizes the responsibilities for the DB Team and GDOT on each of the Project information tasks. It also describes the general timeframe and audience for these activities.

Table 2-2: DB Team Project Information Tasks and Responsibilities

<table>
<thead>
<tr>
<th>Task</th>
<th>Audience</th>
<th>Timeframe</th>
<th>Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Responding to General Public Inquiries/</td>
<td>General Public</td>
<td>Project Duration</td>
<td>DB Team with oversight from GDOT</td>
</tr>
<tr>
<td>comments</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Continuous Communications with Elected/</td>
<td>All Audiences</td>
<td>Monthly at Key Milestones and as</td>
<td>GDOT to coordinate and facilitate with support from</td>
</tr>
<tr>
<td>Public Officials</td>
<td></td>
<td>requested</td>
<td>the DB Team</td>
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<td></td>
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<tr>
<td>Task</td>
<td>Audience</td>
<td>Timeframe</td>
<td>Responsibility</td>
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<td>----------------------------------</td>
<td>-------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Public Information Meetings</td>
<td>General Public</td>
<td>Key Milestones and as requested</td>
<td>GDOT to coordinate and facilitate with support from the DB Team</td>
</tr>
<tr>
<td>Public Outreach Meetings</td>
<td>Selected Groups</td>
<td>Project Duration, as Necessary</td>
<td>GDOT to coordinate and facilitate with support from the DB Team</td>
</tr>
</tbody>
</table>
| Traffic Impact and Lane, Ramp and Road Closure Notices | General Public | Duration of Construction Period | The DB Team to provide information to GDOT in advance of traffic impacts. Weekday traffic interruptions for the next week shall be disseminated by the DB Team no later than noon the Thursday before.
Weekend traffic interruptions for the next weekend shall be disseminated by the DB Team no later than the close of business the Wednesday before.
Ramp and road closure notices shall be requested by the DB Team a minimum of two weeks prior to the closure. |
<p>| Website Information                  | General Public   | Project Duration                 | GDOT with support from DB Team                                                |
| News Releases and Traffic Advisories | General Public   | Project Duration                 | GDOT with support from the DB Team                                            |
| Crisis Communications                 | General Public   | As Necessary During Project      | GDOT with support from the DB Team per Emergency Plan                           |
| Responding to News Media Inquiries   | General Public (via media) | Project Duration | GDOT Project support staff to serve as media contact with support from the DB Team |
| Electronic Communications, Social Media, E-newsletter | All Audiences | Project Duration | GDOT with support from the DB Team                                           |
| Special Events Highlighting Project Milestones | Targeted Stakeholders | Groundbreaking and Open to Traffic | GDOT with support from the DB Team                                           |
| Print Materials                      | All Audiences    | Project Duration                 | GDOT with support from the DB Team                                            |</p>
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3 DESIGN AND SUBMITTALS

3.1 General

The DB Team shall provide Project Submittals in both electronic and hardcopy format.

The DB Team may design and construct the Project in multiple phases. See Section 2.2.5 for requirements of the Construction Phasing Plan and Submittal Schedule.

Proprietary structural design software may be used in lieu of GDOT specific computer software products. All alternative software products are subject to prior GDOT approval, and upon such approval may be used to design the following structural elements:

1. Prestressed concrete beams,
2. Steel girders (both curved and straight),
3. Concrete decks,
4. Bridge substructure, including end bents and intermediate bents;
5. Foundations, including pilings and drilled caissons; and

Structural analysis software may be used to perform complex analysis or finite element modeling of bridges and bridge elements.

The DB Team may utilize spreadsheets or MathCad-type programs to develop “hand calculations” for repetitive design elements.

All software, spreadsheets, and MathCad output shall be present in design documentation so that it can be verified to be compliant with design requirements by an independent checker. For hand calculations developed using software, the input, formulas (with code references shown) and output shall be provided so that it can be verified. Proprietary software output shall not be a “black box” type output, and all code checks shall be visible to be verified by an independent checker. GDOT may require further verification of results of any design software using GDOT bridge design programs, hand calculations, or structural analysis software. The DB Team shall seek GDOT determination of any such reviews and account for any additional GDOT review time in the Project Schedule, which additional time shall not constitute a Relief Event.

Use of any software does not relieve the designer of their responsibility to perform required QA/QC of designs performed using this software. Errors or deficiencies that exist in any proprietary or commercial software that produce errors in the design or construction will be the responsibility of the DB Team.

INROADS output and Microsoft Excel spreadsheets may be subject to verification of results using GDOT’s bridge geometry program.
3.1.1 GDOT Standards and Manuals

All Work shall comply with all applicable Manuals and Guidelines developed for and including AASHTO, FHWA, GDOT, and additional requirements stated in Attachment 3-1 Manuals and reasonably inferred therefrom.

3.1.2 Detailed Estimate of Quantities

The DB Team shall provide a detailed estimate with the RFC Plans that identifies GDOT Pay Items, SCDOT Pay Items, pay item descriptions, units, and estimated quantities for the Project. The DB Team shall provide quantities in the Final Bridge Plans in accordance with the GDOT Bridge and Structures Design Manual.

3.2 Design

3.2.1 Design Workshop

Within fifteen (15) days of NTP 1, the DB Team shall arrange a design workshop which shall be attended by the Designer’s personnel, GDOT, and the UAT and any invited participants of the Project. The purpose will be to familiarize involved personnel with the design concepts, issues, status, and review procedures. The DB Team and GDOT will jointly develop the agenda of the workshop and agree upon how it will be organized (such as by GDOT department and engineering discipline). During the design workshop, the DB Team and GDOT will discuss the application of Interim Design Reviews to reach resolution for Project elements that pose complex constraints or entail additional review effort. The workshop will also discuss the extent of GDOT and UAT reviews. The primary goal of the workshop is to make the design review process more effective and efficient for all parties. Agreements made regarding design review times shall be aspirational only and shall not override the durations stipulated in the DB Documents.

3.2.2 Design Reviews

Design reviews and meetings shall be conducted by the DB Team’s Engineer of Record (EOR). The DQAM, the DB Team’s independent design reviewer(s), and any design professionals having significant input into the design under review shall be present. The DB Team shall notify and invite GDOT and the UAT to participate in all design reviews. The EOR shall organize and facilitate the design review kick-off workshop with GDOT no later than thirty (30) days from NTP 1 to discuss the DB Team’s approach to design the Project, any phasing, design packages, and related design Submittals. Thereafter, design review meetings shall be scheduled no less frequently than monthly, or to the frequency determined by GDOT, until all Submittals have been accepted and Final Design achieved. Multiple, weekly design meetings for various aspects of the design should be planned and shall be accounted for in the DB Team’s level of effort for design and scheduling. GDOT may also invite additional stakeholders to attend. GDOT’s participation in design reviews shall not relieve the DB Team of its responsibility for the satisfactory completion of the Work in accordance with all requirements of the DB Documents.
The DB Team’s EOR or designated design leads shall provide the agendas of the meetings at least three (3) days in advance of the meetings which shall include a detailed summary status of all submittals provided to GDOT that are the subject of the meeting. A design submittal detailed summary status list shall be provided monthly and, at a minimum, shall provide date submitted, to whom it was submitted, contractual required review period, total days in submission, date accepted, and associated comments for each submittal transmitted to GDOT or any other Person.

The DB Team shall provide or make available to review meeting participants all design documents (e.g., drawings, reports, specifications, basis of design memorandums, and other technical memorandums as necessary to support design decisions) pertinent to the design review, including all prior comments and actions resulting therefrom. The DB Team shall prepare and distribute minutes from the review meetings within three (3) days of the meeting.

At a minimum, Design Reviews shall be conducted for the following:

1. **Conceptual Layout Plans submittal** shall include alignment and lane configuration information necessary to verify lane continuity and general scope compliance for the entire Project.

2. **Preliminary Design Submittal** shall be sufficiently developed to show and GDOT to verify that the concepts proposed by the DB Team comply with the detailed requirements of the DB Documents. The DQAM shall verify in writing the compliance and completeness of the Design Submittal prior to submitting and presenting the Preliminary Design to GDOT for review. During this design review meeting, the following issues shall be discussed:
   a. All requirements of the DB Documents applicable to the proposed concept documents, including all applicable standards and legal requirements, environmental compliance, and environmental permit conditions have been identified, and the proposed designs are in compliance.
   b. That the proposed concepts are substantiated and justified by adequate Site investigation and analysis.
   c. Right of way requirements have been identified and any changes to the State Proposed right of way have been addressed for GDOT to maintain and operate the Project after Final Acceptance.
   d. The constructability of the proposed concepts and design.
   e. The availability of required materials and equipment.
   f. That the proposed concepts meet all quality requirements, and all required Design Quality Management Plan procedures have been followed including those for Site maps and concept drawings, as well as draft specifications for any materials or methods that are not industry standard.
   g. The acceptance of all Design Exceptions and Variances.
3. Optional limited Interim Design reviews are intended to resolve conflicts and unresolved comments after the Preliminary Design has been reviewed but prior to Final Design. The DB Team should use Interim Design Reviews to remedy conflicts, account for exceptions, and incorporate betterments. The DB Team shall notify GDOT and the UAT if Interim Design reviews are necessary and shall schedule the necessary design reviews. Workshops, meetings and over-the-shoulder reviews are means to facilitate Interim Design reviews with GDOT.

The DB Team may also use Interim Design reviews to verify that the concepts and parameters established and represented by Preliminary Design are being followed and that all requirements of the Agreement continue to be met. The DB Team shall specifically highlight, check, and bring to the attention of GDOT any information differing from or supplemented to that presented at the Preliminary Design review.

4. Final Design reviews shall verify that the concepts and parameters established and represented by Preliminary Design and any Interim Designs are being followed and that all Agreement requirements continue to be met. The DB Team shall specifically highlight, check, and bring to the attention of GDOT any information differing from or supplemental to that presented previously. Prior to scheduling the Final Design review with GDOT and the UAT, the Design Quality Assurance Manager’s independent review shall have been completed.

The DB Team shall be responsible for demonstrating that any proposed specifications meet or exceed the minimum DB Document and permit requirements. GDOT shall have final determination that these requirements are being met and that the specifications are suitable and appropriate to control the Work.

5. Temporary Works design reviews, except where public safety might be affected, are the responsibility of the DB Team to assure conformance with the Final Design plans and specifications and in accordance with the DB Document requirements. The DB Team shall verify pertinent dimensions in the field prior to conducting a Temporary Works plan review. The DB Team shall check, review, and certify Temporary Works Designs prior to their use in fabrication or construction.

6. Review of the Record Documents shall be performed initially by the DB Team to assure red-lines and authorized changes to the Final Design Plans are properly notated on the record plans and specifications, and that quality documents and facility records indicating variances or changes have been reflected on the plans and specifications. Once the DQAM has completed its review, the Record Drawings are to be submitted to GDOT for review and acceptance.

7. Independent design review for any tolling-related components shall be conducted by the same team of individuals for the entire Project unless approved in writing by GDOT.

Design quality records shall be maintained by the DB Team in an auditable format according to the QMP procedures. GDOT has the right to audit the quality records for
compliance with the QMP and DB Document requirements. Upon completion of the Project, all quality records shall be turned over to GDOT.

3.2.3 Changes Subsequent to Review

If the design is amended subsequent to design review and acceptance by GDOT, the DB Team shall re-check and re-certify the design as an additional design review. Substantive changes to plans and specifications initiated by the DB Team and already checked by the EOR and certified by the DQAM shall be subjected to the design review process as an entirely new design.

3.3 Other Agency Approvals

3.3.1 Federal Aviation Administration

Unless otherwise specified in the DB Documents, the DB Team shall be responsible for all costs for ascertaining and obtaining all required approvals, permits, and agreements for performance of the Work with the Federal Aviation Administration (FAA). The DB Team is responsible for all costs of the Work, whether incurred by the DB Team or by the FAA.

The DB Team shall ensure that design and permanent and temporary construction complies with requirements of the Federal Aviation Administration (FAA) aeronautical study.

3.4 Design Data Book

The DB Team shall document all design criteria and design decisions in a Project Design Data Book submitted for approval, and kept with the Project files. The Project Design Data Book shall include complete and up-to-date design parameters and decisions (as applicable to the Project) as presented in Chapter 5, Concept Design of the GDOT Plan Development Process (GDOT PDP) included in Attachment 3-1 Manuals.

The DB Team shall submit the initial Project Design Data Book for GDOT review and approval no later than thirty (30) days after NTP 1. The DB Team shall not submit any Design Submittal until the Project Design Data Book has been approved.

The DB Team shall update and include the relevant portions, or as requested by GDOT, of the Project Design Data Book with each design submittal, including Preliminary Design, Final Design, RFC, and RFC revisions. The DB Team shall include the finalized and comprehensive Design Project Data Book with the Record Drawings submittal.

3.5 Design Submittals and Progress of Design Work

Documents received after 12:00 p.m. (noon) Eastern Standard or Daylight Time (as applicable), including all notices, correspondence, communications (including e-mail and facsimile), or other Submittals received after 12:00 p.m. (noon) shall be deemed received
on the first Business Day following delivery (for example, in order for a fax to be deemed received on the same day, at least the first page of the fax must have been received before 12:00 p.m.).

Each required Submittal shall be delivered to GDOT in conformance of the review times provided in Article 6.3.2 and in Volume 2, Table 3-1: Master Submittal List. The times provided in Volume 2, Table 3-1 are specifically for the review period required for GDOT to comment and GDOT to subsequently accept. Accuracy, completeness, and time spent to address GDOT comments and resubmit for re-review are the responsibility of the DB Team.

No fabrication, casting, or construction will occur until all related design review and shop drawing review comments are resolved and the corresponding drawings and specifications have been accepted by GDOT and stamped “Released for Construction.”

All design Submittals shall be complete along with all the supporting information necessary for review. The Submittal and supporting information must represent logical Work activities and must show impacts on subsequent Work on this Project. Any modification to the component construction due to subsequent design changes or as a result of design development is solely at the DB Team’s risk, regardless of GDOT acceptance.

3.6 Additional Submittal Requirements

The DB Team is responsible for obtaining any Government Approvals or other approvals required to allow for implementation and construction of the Construction Phasing Plan.

3.6.1 Staged Design Submittals

Once the Conceptual Layout Plan for the entire Project has been accepted by GDOT, the DB Team is allowed to submit Staged Design Submittals (components) instead of a completed set of drawings for an entire accepted Construction Phase. A Staged Design Submittal is a submittal that consists of a portion or portions of the Work within the limits of an accepted Construction Phase. For example, a Staged Design submittal for a bridge might be categorized as foundations, substructures, abutments, or complete continuous units of superstructure. Staged Design Submittals for other components of the Project might include grading, drainage, signing and pavement marking, and erosion control. If the DB Team chooses to provide Staged Design Submittals, the list of Staged Design Submittals shall be identified as part of the proposed Construction Submittals Schedule.

3.6.2 Changes to Accepted and Released for Construction Submittals

After a design package has been Released for Construction, any subsequent plan or design changes must be submitted to GDOT with documentation sufficient to justify the reasoning behind the change request. The DB Team must obtain written acceptance prior to its implementation as a plan revision, and also prior to any related subsequent construction activity.
3.6.3 **Presentation Requirements**

The DB Team shall provide all plan submittals as required by and in accordance with the GDOT Plan Development Process (PDP), Electronic Data Guidelines (EDG) and the Plan Presentation Guide (PPG).

The Plans shall be fully dimensioned in English units; all elevations necessary for construction shall be shown similar to GDOT’s normal practice. All plans are to be prepared on the scales according to GDOT’s Plan Presentation Guide (PPG).

Each location shall include details for all civil elements and calculations within proximity of the site so that these locations can be reviewed holistically and connections with communication and electrical networks are clearly understood.

3.6.4 **Construction Plans Organization and Sheet Index**

Construction plans shall be assembled according to the GDOT Plan Presentation Guide (PPG).

3.6.5 **Computations**

All design computations and computer printouts shall be neatly recorded on 8 ½- by 11-inch sheets, fully titled, numbered, indexed, dated and signed by the designer/Project manager and checker. The computer files and two copies of the computations fully checked and appropriately bound, shall be submitted to GDOT with the plans. A complete tabulation of the drainage analysis along with the calculations used to determine the size of drainage structures shall be submitted to GDOT.

3.6.6 **Submittal Formats**

Each design submittal shall, in addition to electronic delivery in .pdf format on the PMCS, consist of ten (10) sets of scalable 11- x 17-inch or 12- x 18-inch drawings, six (6) full size 24- x 36-inch design drawings and six (6) sets of calculations and a portable flash drive of the submittal including all InRoads, MicroStation V8 format files. For all Final Plan submittals (plans, calculations, specifications, reports, etc.), each document shall be sealed by a qualified Professional Engineer. In addition to written design review comments (if any), design drawings may be returned to the DB Team with any remarks indicated. After a design drawing submittal is “Released for Construction”, the DB Team shall, in addition to posting the complete electronic files on the PMCS, furnish GDOT with three (3) full size 24- x 36-inch sets and ten (10) sets of 11- x 17-inch or 12- x 18-inch corrected design drawings as well a portable flash drive containing the design drawings in In-Roads, Micro-station V8 format. After all individual Staged Design Submittals have been accepted for a particular Construction Phased Plan; a final complete set of plans for the Construction Phase will be compiled and provided to GDOT as the Released for Construction set.

3.6.7 **Additional Specifications**

In addition to the design drawings that include Georgia standards and details, the DB Team shall prepare and submit specifications for construction work included in the plans.
which are not covered by GDOT’s Standard Specifications, the Supplemental Specifications and/or the Special Provisions as required in Attachment 3-1 Manuals.

Any submittal(s) received by GDOT after 12 PM (noon) shall be considered as being received the following Business Day.

3.6.8 Submittals Process

Review of the Design Documents by GDOT may be limited to the basic requirements of the DB Documents, relating to design compliance and material type(s) and may not include detailed review or checking of design of components and related details or the accuracy with which such designs are depicted on the design drawings.

Review or acceptance by GDOT or other Persons of any Design Documents shall not relieve the DB Team of responsibility under the Contract, including the overall correctness of Design Documents including engineering mathematical computations. All Design Documents, including plans, specifications, reports, calculations, shop drawings (where public safety is affected) and Permit documents shall be submitted to GDOT.

The DB Team shall provide all copies for distribution. GDOT will be responsible for distributing the submittals to all required parties of the contract.

All Submittals shall include a cover letter describing the submittal, review period, and the due date for any GDOT response.

All Submittals shall include the DB Team’s QA certification statement (in addition to the design consultant’s QA certification statement for all design-related submittals). GDOT will reject any submittal if the QA certification statement is not included. Each submittal shall also provide a certification statement that the submittal complies with all terms and conditions of the Agreement, signed by the EOR.

3.6.9 Required Participants of the Process

The QAM and DQAM, except as otherwise required in the DB Documents, will be primarily responsible for verifying that the accepted Design Quality Management Process as required in Section 2.3 has been followed, verifying that the submittal meets all DB Document requirements, ensuring that all necessary Governmental Approvals have been obtained by the DB Team, and performing any review(s) as provided for in Section 3.

The DB Team is responsible to provide all required Submittals in compliance with the DB Documents and in compliance of the accepted Submittals Schedule. The DB Team must further provide a certification that the submittal meets the terms of the DB Documents and has been independently reviewed in accordance with the accepted Design Quality Management Plan (see Section 2.3) with each submittal.
3.6.10 GDOT Design Review Process

The DB Team shall provide the submittal to GDOT via the PMCS and shall provide the required hard copies in accordance with the Submittal Schedule. Submittals shall be categorized into Discipline Groups as follows:

1. Right of Way, Railroad, and Utilities (RRU Group)
2. Roadway, Drainage, and Maintenance of Traffic (RDMOT Group)
3. Bridge, Structures, Retaining Walls, and Aesthetics (BSRA Group)
4. ITS, Traffic (includes signing, pavement marking, signals and lighting) (ITSTT)
5. All types (ALL Group)
6. Other (OTH)

GDOT will log in the submittal and distribute to the required review participants.

The review period begins the following Business Day after any submittal is received for the period prescribed in Article 6.3.2 and Table 3-1: Master Submittal List, except where there is a maximum number of concurrent submittals of a particular type specifically noted in this Section 3. In cases where the maximum is exceeded, the review period will begin when prior submittal reviews are completed so that the maximum number in concurrent review is not exceeded. For the general case where there is not a maximum number of concurrent submittals specifically noted in this Section 3, an additional seven (7) days will be added to the prescribed review period whenever there are more than five (5) concurrent submittals in review in the subject document's particular Discipline Group. Further, an additional seven (7) days will be added for each additional increment of five (5) concurrent submittals in review in a Discipline Group. For example, if there are six (6) to ten (10) submittals in concurrent review in a Discipline Group, then an additional seven (7) days are added; and if there are eleven (11) to fifteen (15) submittals in concurrent review in a Discipline Group, then an additional fourteen (14) days are added, etc. For purposes of calculating the number of submittals, the accepted Submittal Schedule will generally be used as a guide except that complementary documents, for example bridge plans and bridge calculations, will be considered a single Submittal. Documents that fully integrate multiple disciplines in the presentation, for example roadway and drainage plans, together with the respective calculations would be counted as one submittal. For documents or packages that include multiple bridges or toll gantries, each individual bridge or toll gantry will be counted as a separate submittal. For documents or packages that include multiple retaining walls, noise barriers, BFIs, or WFIs, GDOT will make a determination on the number of Submittals to be counted.

Once a review is complete, the drawings or Submittal will be designated by GDOT as either:

- Accepted
• Accepted with Comments

• Rejected

The terms “Accepted” and “Accepted with Comments” shall mean that the design process may proceed and is not a notice that construction may begin.

• If “Accepted” or “Accepted with Comments”, the GDOT representative will deliver the comments and, if necessary, return the drawings or Submittal via PMCS or hard copy to the DB Team.

• If “Rejected”, the GDOT representative shall deliver the rejected drawings or Submittal via PMCS or hard copy to the DB Team. The DB Team shall address the specific comments and resubmit. The resubmittal shall be a new Submittal and shall follow the same time period as provided in Article 6.3.2 and Table 3-1: Master Submittal List. Drawings or Submittals may be rejected without review if the submission is incomplete.

### 3.7 Shop Drawings and Temporary Works Submittals

#### 3.7.1 General

Shop drawings include all working, shop, and erection drawings, associated trade literature, calculations, schedules, manuals, and similar documents submitted by the DB Team to define some portion of the Project work. The type of work includes both permanent and temporary works as appropriate to the Project. Permanent works include all the permanent structures and parts thereof required of the completed DB Documents. Temporary works include any temporary construction work necessary for the construction of the permanent works. This includes falsework, formwork, scaffolding, shoring, temporary earthworks, sheeting, cofferdams, special erection equipment, and the like. Falsework includes any temporary construction work used to support the permanent structure until it becomes self-supporting. Falsework includes steel or timber beams, girders, columns, piles and foundations, and any proprietary equipment including modular shoring frames, post shores, and adjustable horizontal shoring. Formwork includes any structure or mold used to retain plastic or fluid concrete in its designated shape until it hardens. Formwork comprises common materials such as wood or metal sheets, battens, soldiers and walers, ties, proprietary forming systems such as stay-in-place metal forms, and proprietary supporting bolts, hangers, and brackets. Formwork may be either permanent formwork requiring a shop drawing submittal such as stay-in-place metal or concrete forms, or may be temporary formwork that requires certification by the Professional Engineer designing the specialized component(s) (the “Specialty Engineer”) for construction affecting public safety and for major and unusual structures. Scaffolding is an elevated work platform used to support workmen, materials and equipment, but not intended to support the structure. Shoring is a component of falsework such as horizontal, vertical or inclined support members. This term is interchangeable with falsework.

Construction affecting public safety is defined as construction that may jeopardize public safety, such as structures spanning functioning vehicular roadways, pedestrian
walkways, railroads, navigation channels of navigable waterways, and walls or other structure foundations located in embankments immediately adjacent to functioning roadways. It does not apply to those areas of the Site under the DB Team’s control and outside the limits of, or influence of, normal public access.

For the purpose of shop drawing review and processing as described in this Section 3.7, the term “Shop Drawing Engineer” shall be a Professional Engineer as defined in Exhibit 1 of Volume 1 and will apply to the initiator or producer of shop drawings regardless of whether or not that party is normally the lead Professional Engineer for the design or the EOR; and the term “Shop Drawing Checking Engineer” shall be a Professional Engineer as defined in Exhibit 1 of Volume 1 and will apply to the shop drawing checker and certifier regardless of whether or not that party is normally the EOR, the Shop Drawing Engineer, or the lead Professional Engineer for the design.

3.7.2 Work Items Requiring Shop Drawings

In general, GDOT requires shop drawings for items of work not fully detailed in the plans which require additional drawings and coordination prior to constructing the item, including:

1. Bridge components not fully detailed in the plans (i.e., segments, steel girder details, post-tensioning details, handrails, etc.)
2. Retaining wall systems
3. Precast box culverts
4. Non-standard drainage structures, attenuators, and other nonstructural items
5. Building structures
6. Drainage structures, attenuators, and other nonstructural items
7. Design and structural details furnished by the DB Team in compliance with the DB Documents
8. Temporary Works affecting public safety

3.7.3 Schedule of Submittals

Shop drawings shall be included in the required Submittal Schedule. For each planned shop drawing submittal, the DB Team shall define the type and approximate number of drawings or other documents that are included and the planned submittal date, considering the processing requirements herein. The DB Team shall coordinate subsequent submittals with Project Schedule and Submittal Schedule to allow sufficient time for review and re-submittal as necessary.
3.7.4  Style, Numbering, and Material of Submittals

3.7.4.1  Drawings

The DB Team shall submit the shop drawings electronically in .pdf format on the PMCS. In addition to the electronic delivery, the DB Team shall furnish four (4) sets of shop drawings to GDOT for review. The DB Team shall consecutively number each sheet in the submittal series, and indicate the total number in the series (i.e., 1 of 12, 2 of 12, . . ., 12 of 12), and shall include on each sheet the following items as a minimum requirement:

1. Bridge Number(s),
2. drawing title and number,
3. a title block showing the names of the fabricator or producer and the DB Team for which the work is being done,
4. the initials of the person(s) responsible for the drawing,
5. the date on which the drawing was prepared,
6. the location of the item(s) within the Project,
7. the DB Team’s approval stamp with date and initials, and, when applicable,
8. the signature and seal of the Specialty Engineer.

A re-submittal will be requested when any of the required information is not included.

3.7.4.2  Other Documents

In addition to electronic delivery in .pdf format on the PMCS, the DB Team shall provide four (4) sets of original documents or clearly legible photographic or xerographic copies of documents other than drawings, such as trade literature, catalogue information, calculations, and manuals. The DB Team shall clearly label and number each sheet in the submittal to indicate the total number of sheets in the series (i.e., 1 of 12, 2 of 12, . . ., 12 of 12), and shall provide an additional three (3) sets of documentation for items involved with precast pre-stressed components, and provide an additional two (2) sets of documentation for items involving structural steel components. The DB Team shall bind and submit all documents with a table of contents cover sheet, and list on the cover sheet the total number of pages and appendices, and include a title referencing the submittal item(s), the name of the firm and person(s) responsible for the preparation of the document, the DB Team’s approval stamp with date and initials, and, when applicable, the signature and seal of the Specialty Engineer. The DB Team shall submit appropriately prepared and checked calculations and manuals that clearly outline the design criteria, and shall include on the internal sheets the initials of the person(s) responsible for preparing and checking the document. The DB Team shall clearly label trade literature and catalogue information on the front cover with the title, date and name of the firm and person(s) responsible for that document.

3.7.4.3  Qualified Products

Shop drawings are not required for Qualified Products accepted by GDOT or SCDOT and included on the Qualified Product Lists as specified in Attachment 3-1 Manuals. For non-
Qualified Products, the DB Team shall submit shop drawings to GDOT after the Shop Drawing Checking Engineer has reviewed and accepted for conformance with the DB Documents and compliance to the design intent. Upon completion of GDOT’s review, GDOT’s red ink review stamp will signify an officially reviewed shop drawing and will state either “Released for Construction” or “Released for Construction as Noted”.

3.7.4.4 DB Team-Originated Design

The DB Team shall submit shop drawings and applicable calculations to the Shop Drawing Checking Engineer for review, and shall ensure that each sheet of the shop drawings and the cover sheet of the calculations are signed and sealed by the Shop Drawing Engineer.

3.7.4.5 Temporary Works

For construction affecting public safety, the DB Team shall submit shop drawings and the applicable calculations for the design of special erection equipment, false-work, scaffolding, etc. to the Shop Drawing Checking Engineer, and shall ensure that each sheet of the shop drawings and the cover sheet of the applicable calculations is signed and sealed by the Shop Drawing Engineer.

3.7.4.6 Formwork and Scaffolding

The DB Team is solely responsible for the safe installation and use of all formwork and scaffolding. GDOT does not require any formwork or scaffolding submittals unless such work would be classified as construction affecting public safety.

3.7.4.7 Other Miscellaneous Design and Structural Details Furnished by the DB Team in Compliance with the Contract

The DB Team shall submit shop drawings and the applicable calculations to the Shop Drawing Checking Engineer, and shall ensure that each sheet of the shop drawings and the cover sheet of the applicable calculations is signed and sealed by the Shop Drawing Engineer.

3.7.5 Processing of Shop Drawings

3.7.5.1 DB Team Responsibility for Accuracy and Coordination of Shop Drawings

The DB Team shall coordinate, schedule, and control all submittals, with a regard for the required priority, including those of the various subcontractors, suppliers, and GDOT, to provide for an orderly and balanced distribution of the work. The DB Team shall also coordinate, review, date, stamp, accept, and sign all shop drawings prepared by the DB Team, Contractors, or DB Team-Related Entities (subcontractor, fabricator, supplier, etc.) prior to submitting them to GDOT for review. Submittal of the drawings confirms verification of the work requirements, units of measurement, field measurements,
construction criteria, sequence of assembly and erection, access and clearances, catalog numbers, and other similar data. The DB Team shall indicate on each series of drawings the specification section and page or drawing number of the Released for Construction plans to which the submission applies, and shall indicate on the shop drawings all changes from the Released for Construction drawings and itemize all changes in the letter of transmittal. Likewise, whenever a submittal conforms to the Released for Construction plans, the DB Team shall clearly state so in the transmittal letter. The DB Team shall schedule the submission of shop drawings to allow a GDOT review period as specified in the DB Documents. The review period commences upon GDOT’s receipt of the valid submittal or re-submittal and terminates upon the transmittal of the submittal back to the DB Team. The DB Team is discouraged from transmitting voluminous submittals of shop drawings at one time. For submittals transmitted in this manner, the DB Team shall allow for additional review time. Only shop drawings distributed by GDOT with the “red ink” stamps are valid and all work that the DB Team performs in advance of GDOT’s release of shop drawings will be at the DB Team’s risk.

3.7.5.2 Scope of Review by the Shop Drawing Checking Engineer

The Shop Drawing Checking Engineer’s review of the shop drawings is for conformity to the requirements of the DB Documents and to the intent of the design. The Shop Drawing Checking Engineer’s review of shop drawings, which includes means, methods, techniques, sequences, and construction procedures, is limited to the effects on the permanent works. The Shop Drawing Checking Engineer’s review of submittals, which includes means, methods, techniques, sequences, and construction procedures, does not include an in-depth check for the ability to perform the Work in a safe or efficient manner.

3.7.5.3 Special Review by the Shop Drawing Checking Engineer of Shop Drawings for Construction Affecting Public Safety

For construction affecting public safety, the Shop Drawing Checking Engineer will make an independent design review of all relevant shop drawings and similar documents. The DB Team shall not proceed with construction of the permanent works until receiving the Shop Drawing Checking Engineer’s approval. The DB Team shall send a copy of the approval letter to GDOT. The review of these shop drawings is for overall structural adequacy of the item to support the imposed loads and does not include a check for economy, efficiency, or ease of construction.

3.7.6 Other Requirements for Shop Drawings for Bridges

3.7.6.1 Shop Drawings for Structural Steel and Miscellaneous Metals

The DB Team shall furnish shop drawings for structural steel and miscellaneous metals. Shop drawings shall consist of working, shop, and erection drawings, welding procedures, and other working plans showing details, dimensions, sizes of material, and other information necessary for the complete fabrication and erection of the metal work.
3.7.6.2 Shop Drawings for Concrete Structures

The DB Team shall furnish shop drawings for concrete components that are not cast-in-place and are not otherwise exempted from submittal requirements, shall also furnish shop drawings for all details that are required for the effective prosecution of the concrete work and are not included in the DB Documents such as: special erection equipment, masonry layout diagrams, and diagrams for bending reinforcing steel, in addition to any details required for concrete components for the permanent work.

3.7.6.3 Special Construction Submittals

In addition to any other requirements, within sixty (60) days from the issuance of Notice to Proceed 1, the DB Team shall submit information to GDOT outlining the plan for integration into the overall approach to the Project. Where applicable to the Project, include:

1. The overall construction program for the duration of the Agreement. Clearly show the milestone dates (for example, the need to open a structure by a certain time for traffic operations.)

2. The overall construction sequence. The order in which individual structures are to be built, the sequence in which individual spans of girders or cantilevers are erected, and the sequence in which spans are to be made continuous. Erection plans and sequence drawings shall be provided for all bridge construction work to be performed on or over railroad ROW as defined in Section 14 of Volume 3.

3. The general location of any physical obstacles to construction that might impose restraints or otherwise affect the construction, and an outline of how to deal with such obstacles while building the structure(s) (for example, obstacles might include road, rail and waterway clearances, temporary diversions, transmission lines, utilities, property, and the DB Team’s own temporary works, such as haul roads, cofferdams, plant clearances, and the like.)

4. The approximate location of any special lifting equipment in relation to the structure, including clearances required for the operation of the equipment (for example, crane positions, operating radii, and the like.)

5. The approximate location of any temporary falsework, and the conceptual outline of any special erection equipment. Provide the precise locations and details of attachments, fixing devices, loads, etc. in later detailed submittals.

6. An outline of the handling, transportation, and storage of fabricated components, such as girders or concrete segments. Provide the precise details in later detailed submittals.

7. Any other information pertinent to the proposed scheme or intended approach.

Clearly and concisely present the above information on as few drawings as possible in order to provide an overall, integrated summary of the intended approach to the Project. GDOT will use these drawings for information, review planning, and to assess the DB Team’s approach in relation to the intent of the original design. The delivery to and
receipt by GDOT does not constitute any GDOT acceptance or approval of the proposals shown thereon; the DB Team shall include the details of such proposals on subsequent detailed shop drawing submittals, and shall submit timely revisions and re-submittals for all variations from these overall scheme proposals.

### 3.7.6.4 Shop Drawings Requiring Railroad Coordination

GDOT acceptance of shop drawings and submittals involving railroad coordination and review does not constitute final acceptance to begin work on these items. Refer to the requirements of Section 14 for coordination and duration of shop drawing reviews for construction work being performed on or over the ROW of the railroad. Direct coordination between GDOT (including the GDOT Bridge Office and/or Utilities Office) and the railroad will be necessary to ensure that all necessary approvals from the railroad are in place prior to beginning of construction activities in these areas.

### 3.7.6.5 Modifications on Construction

Where GDOT allows the DB Team to make modifications to the permanent works for the purposes of expediting the DB Team’s chosen construction methods, the DB Team shall submit proposals to the EOR for review and approval prior to modifying the works. Proposals for minor modifications shall be submitted under the shop drawing process. The DB Team shall indicate on all drawings the change(s) from the DB Documents and itemize all Change Requests in the letter of transmittal. GDOT will require additional submittals for major modifications. Minor modifications are those items that, in GDOT’s sole discretion, do not significantly affect the quantity of measured work, or the integrity or maintainability of the structure or its components (for example, adjusting concrete dimensions, substituting steel plate sizes, changing reinforcing bar size and spacing, etc., all within the acceptable limits of the design). Major modifications are any modifications that, in the opinion of GDOT, significantly affect the quantity of measured work, or the integrity or maintainability of the structure or its components; for example, substituting alternative beam sizes and spacings, changing material strength or type, and the like.

The DB Team shall provide signed and sealed revised sheets to GDOT for any required revisions to the Released for Construction plans prior to submitting shop drawings. GDOT’s decision on the delineation between a minor and a major modification and the disposition of a proposal is final.

### 3.8 Release for Construction Documents

Sufficient review and revision time shall be provided in the schedule and account for possible multiple re-submittals to secure a final Release for Construction prior to starting construction on any particular Element of the Work. Construction cannot proceed on any of the Work until the design Submittal has been reviewed, accepted, and Released for Construction.

For final Submittals, after updating the documents to resolve all comments (as applicable) and receiving written notice from GDOT that the drawings or Submittal are "Released for
Construction", the DB Team shall stamp the accepted set “Released for Construction” and distribute copies to GDOT within three (3) Business days.

3.9 Record Drawings and Project Closeout

The EOR shall perform a Site visit at no more than thirty (30) days following NTP 3, and subsequent site visits every thirty (30) days thereafter until Substantial Completion is achieved. Additionally, an EOR Site visit shall take place at the midpoint of each and every individual bridge construction. The purpose of the Site visits is for the EOR to visually inspect the progression of the Work for compliance to the RFC Documents. The EOR shall prepare a Site observation compliance report to document elements of the work that are compliant and non-compliant with the RFC Documents. If elements of the work are not compliant with the RFC Documents, the EOR shall coordinate with the DB Team to determine corrective action and describe the corrective action in the Site observation compliance report. The Site observation compliance report shall be submitted within seven (7) days of the Site visit, and shall be stamped by the EOR.

3.9.1 Final Inspection

The EOR and CQAM shall participate in any final inspection and prepare a final Site observation compliance report to document elements of the work that are compliant and non-compliant with the RFC Documents. If elements of the work are not compliant with the RFC Documents, the EOR shall coordinate with the DB Team to determine corrective action and describe the corrective action in the final Site observation compliance report. This process shall be repeated until no non-compliance items remain. The final Site observation compliance report(s) shall be submitted within seven (7) days of the Site visit, and the last one submitted, once all non-compliance items are corrected and meet the DB Requirements, shall be stamped by the EOR and certified by the CQAM as accurate and complete. Final Acceptance cannot be achieved until this process is complete and the final Site observation compliance report, stamped by the EOR and certified by the CQAM as accurate and complete, is received by GDOT.

Refer also to Section 2.3.10 for additional information regarding the final inspection process.

3.9.2 Required Documents

Within 30 days of Substantial Completion and prior to Final Acceptance, the DB Team shall submit to GDOT a complete set of Final Design documents and Record Drawings for all the Construction Phases of the Project. The Record Drawings and documentation shall be an organized, complete record of Work performed and supporting calculations and details that accurately represent what the DB Team constructed. The DB Team shall ensure that the Record Drawings reflect the actual condition of the constructed Work.

Prior to any portion of the Project being opened to traffic, Record Drawings for that portion of the Project shall be submitted in hard copy and electronic format with a signed statement by the EOR and CQAM that the Record Drawings reflect the actual condition of the constructed Work.
3.9.3 **Final Acceptance**

Upon completion of the Construction Work, a complete set of Record Drawings, organized by Construction Phase, shall be provided to GDOT as a condition to Final Acceptance in accordance with Section 3 of Volumes 2 and 3, in the following formats:

- A portable flash drive containing:
  - All electronic design files, electronic calculations, etc.
  - Full-size 24- x 36-inch .pdf of each plan sheet and the entire plan set
- Hard copy of the design databook, and drainage calculations
- Full-size 24- x 36-inch set of bond prints
- Half-size 11- x 17-inch or 12- x 18-inch set of bond prints

These Record Drawings shall not be field sketches or redlines, but shall be CAD generated drawings that compile all field changes, redlines, plan revisions, and all Nonconforming Work into a single “strike-through” format set of plans. Where appropriate, new drawings may be inserted in to the plans to depict portions of the as-built work.

All files shall conform to the criteria for the design platform of choice (CAiCE or InRoads) found in GDOT’s Electronic Data Guidelines (EDG).

The DB Team shall be responsible for all production and delivery of materials needed for GDOT review.

Final Acceptance cannot be achieved until a complete set of Record Drawings is received and accepted by GDOT.
4 ENVIRONMENTAL

4.1 General

The DB Team shall comply with all Environmental Law, and policies set forth by the federal, state, and local agencies with jurisdiction over the construction activities associated with the Project and as described in the approved Environmental Document and permits. The DB Team shall follow all pertinent policies and procedures as described in the 23 CFR 771, O.C.G.A. 12-16-1, and the most recent version of the GDOT Environmental Procedures Manual.

The DB Team shall be responsible for coordination with GDOT and other required approval agencies to ensure that commitments made during the environmental review are being met. The DB Team shall be responsible to reassess Project impacts and for additional associated costs incurred due to any changes in the Project impacts as described in the approved Environmental Document. This may require resubmittal of environmental studies for approval by applicable agencies.

GDOT shall be responsible for completing and resubmitting environmental documentation. The DB Team is not allowed to complete the environmental documentation or reevaluation.

The DB Team shall execute the Environmental Commitments required by the approved Environmental Documents, DB Documents, Governmental Entities, Governmental Approvals, and all applicable federal and State Law.

The DB Team’s obligation regarding Governmental Approvals and Law, including Environmental Law and the DB Team’s obligation for Environmental Compliance is set forth in Volume 2, Section 4. Limits of the Existing and Proposed Right of Way will be described in the approved Environmental Document.

The DB Team shall cause Work to comply with approved Environmental Document, permit, and compliance requirements for any additional actions throughout the Term of the DB Documents. The DB Team shall monitor and document Work activities so that documents providing evidence for compliance are available to FHWA and Governmental Entities (as applicable) and GDOT for inspection at any time. Evidence of compliance activities may include photo documentation and other appropriate methods to demonstrate compliance. The DB Team shall execute the Environmental Mitigation Plan, which lists responsible parties for Environmental Commitments detailed in the approved Environmental Document as agreed to by GDOT and/or other approval agencies.

The DB Team shall consider the use of environmentally sustainable practices and/or materials in the development of the Project.

If the Environmental Documents have not yet been approved, the alternative has not yet been “selected”; therefore, the “No-Build” option will still be a viable alternative for the
Project. However, if the “No-Build” alternative is selected, the Project will be terminated according to Article 19 of the Design-Build Agreement.

4.1.1 Standards

The DB Team shall conduct activities in this section in accordance with GDOT’s Environmental Procedures Manual, other Attachment 3-1 manuals, and other provisions of the DB Documents.

4.2 Environmental Approvals

4.2.1 Responsibilities Regarding Environmental Documents

Environmental Documents were prepared and approved by GDOT prior to the Effective Date. During the Term, such approvals may require re-evaluation, amendment, or supplement as the Work progresses or in order to accommodate actions not identified in the approved Environmental Document or covered specifically by existing resource agency coordination and permits. The DB Team shall be responsible to validate, provide design information to support additional environmental studies (cultural resources, ecology, aquatics, traffic, noise, and/or air) conducted by GDOT or on behalf of GDOT by others. The DB Team will comply with the Environmental Commitments identified in the approved Environmental Document within the final limits of the Project and subsequent approved Environmental Documents as updated to incorporate the DB Team’s Conceptual Layout Plan of Project or Design Documents or due to regulatory or policy changes. The DB Team shall follow GDOT policies and procedures when conducting these activities for the Project.

Any changes to the Project as described in the NEPA Approval may require DB Team to reassess impacts and submit information to GDOT for incorporation into reevaluation reports and studies. The DB Team is not allowed to complete the NEPA document or reevaluation. GDOT shall be responsible for completing and resubmitting NEPA documentation and may procure consultant services that are independent from DB Team to complete the documentation necessary to obtain Environmental Approvals. The DB Team shall follow all pertinent policies and procedures as described in the 23 CFR 771, 23 CFR 772, 23 CFR 774, and the GDOT Environmental Procedures Manual. The DB Team shall be responsible for coordination with GDOT and FHWA to ensure that appropriate environmental documentation and compliance are being followed. GDOT will provide the costs to prepare and finalize the NEPA Re-evaluation documents for FHWA. The DB Team shall be responsible to prepare and pay for supporting documentation for any design changes proposed by the DB Team that differ from the NEPA Approval at the time of the Proposal Due Date.

If the DB Team’s Conceptual Layout Plan of Project or Design Documents deviate from the plan set incorporated into the approved Environmental Documents, then GDOT and/or Governmental Entities will need to conduct an assessment to determine whether the approved Environmental Documents remain valid. The DB Team shall provide
information to support evaluation of the deviations from the plan set incorporated into the approved Environmental Documents. The DB Team shall facilitate a meeting with GDOT within 45 days of NTP 1 to discuss potential deviations from the approved Environmental Document. The following terms define GDOT and/or FHWA required documentation needed to assess impacts to the approved Environmental Document:

- **No Change Reevaluation**: No design or regulatory changes have occurred since the last approved Environmental Document. As applicable, GDOT will utilize document procedures following the Memorandum of Agreement with FHWA dated July 19, 2016.

- **Change Reevaluation (design modifications)**: The Conceptual Layout Plan for the Project or Design Documents contain modifications to the design in the plan set incorporated into the approved Environmental Documents; the Project corridor in the area of the changes (or as applicable) must be considered for additional or reduced environmental impacts. There may be a need for additional agency coordination as a result of the design modifications. As applicable, GDOT will utilize document procedures following the Memorandum of Agreement with FHWA dated July 19, 2016.

- **Change Reevaluation (regulatory/policy changes)**: Changes in Law or regulatory practice may require additional survey or technical analysis, environmental condition changes over time, and associated agency coordination. The additional analysis may be required regardless of design changes, construction staging, etc. (There may be no action taken by the design team that would trigger the additional technical analysis).

The DB Team will be responsible for ensuring compliance with the conditions and schedules set forth in amendments to any approved Environmental Documents due to deviations in the plan set incorporated into the approved Environmental Documents in the Conceptual Layout Plan for the Project and/or the Design Documents.

The DB Team assumes all risk arising out of or related to deviations from the plan set incorporated into the approved Environmental Documents. The DB Team is encouraged to minimize deviations from the plan set incorporated into the approved Environmental Documents. The DB Team shall be responsible to provide all information reasonably required to support evaluation of deviations from the plan set incorporated into the approved Environmental Documents and to comply with all policies and procedures of GDOT and Governmental Entities having jurisdiction over the Project. GDOT shall be responsible for all coordination of environmental studies with appropriate Governmental Entities. The DB Team is responsible to provide GDOT with the information reasonably required for coordination with Governmental Entities. The DB Team is required to have staff that meet the GDOT environmental prequalification requirements.

The DB Team, acting through the Environmental Compliance Manager (ECM), shall designate an environmental team (ET), as detailed in this section, to prevent, minimize,
and/or correct any violation of or noncompliance with Environmental Approvals. The ET shall include the following persons as defined in the following sections: environmental training staff, Environmental Compliance Inspectors (ECI), NEPA Specialist, Archeologist, Historian, Natural Resource Biologist, Water Quality Specialist, Air Quality Specialist, Noise Specialist, Hazardous Materials Manager, and Worksite Erosion Control Supervisor (WECS). All of the ET shall be deemed other principal personnel.

The DB Team shall set forth procedures and methods for the following:

- Staffing and availability of ECM and all ET personnel
- ET staff response times during the Work

4.2.1.1 Environmental Compliance Manager

The DB Team shall designate a full-time ECM for the Work. The ECM shall report and coordinate all issues directly with GDOT and the DB Team’s Project Manager. In the event the ECM, in consultation with the DB Team’s Project Manager and GDOT, is unable to reach satisfactory resolution of environmental issues, the ECM shall provide written notification to the DB Team and GDOT outlining the concerns, actions taken in attempt to correct the concerns, and provide a recommendation as to the suggested course of action.

The ECM shall direct the work of the ET and shall monitor, document, and report environmental compliance for the Work. The ECM shall report immediately to GDOT and DB Team any violation or non-compliance and shall include with any such report, the appropriate recommendations for corrective action including stoppage of Work.

The ECM shall coordinate with GDOT, the DB Team, and appropriate Governmental Entities. The ECM shall submit all necessary environmental documentation and monitoring reports to the appropriate Governmental Entities and when applicable, through GDOT, to the extent necessary to maintain compliance with applicable Environmental Approvals.

The ECM shall be an employee or subcontractor of the DB Team. The DB Team shall not have the ability to relieve the ECM of his or her duty without the written approval of GDOT. Should the DB Team desire to replace the ECM, the DB Team shall submit the résumé of a replacement candidate. The replacement candidate shall be available fulltime within thirty (30) days after delivery of GDOT’s written acceptance. In the absence of the ECM, the DB Team’s Hazardous Materials Manager may act as an interim ECM with GDOT approval.

Qualifications: The ECM candidate shall have at least five (5) years of experience successfully managing environmental compliance of urban freeway construction. This person or firm must be prequalified by GDOT and all costs associated with the ECM shall be included in the DB Team’s Proposal. The qualifying experience required of an ECM candidate must include the following:
1. Has developed and managed a storm water pollution prevention plan
2. Has developed and managed a hazardous substance and petroleum products management plan
3. Has implemented environmental mitigation plans
4. Has provided environmental and personal protection training
5. Has monitored compliance with Section 404 Permit conditions

The ECM's qualifying experience must demonstrate familiarity with:

2. Provisions of the NPDES Construction General Permit (GAR1000002)
3. Requirements of Section 404 and permit provisions

### 4.2.1.2 Environmental Training Staff

Under the direction of the ECM, the environmental training staff shall develop, schedule, and conduct environmental awareness and environmental compliance training for the DB Team’s personnel. All training shall be in accordance with the requirements set forth below.

The DB Team shall develop and implement an Environmental Protection Training Program (EPTP) that shall meet the minimum requirements set forth herein. The EPTP shall include methods and procedures documented in the CEPP to:

1. Educate every worker to:
   a. Recognize the overall importance of environmental issues as they relate to the Project and its successful completion, and
   b. Appreciate the various environmental sensitivities of the Project.
2. Train appropriate staff to:
   a. Recognize environmentally sensitive resources that may be encountered during the Work;
   b. Avoid or take appropriate action to minimize environmental impacts from the Work; and
   c. Know the required actions, practices, and procedures regarding regulated resources.
3. Foster the DB Team’s management and supervisory personnel’s attitude of commitment to the Project's environmental quality.
4. Convey to all workers, the DB Team’s management commitment to the Project's environmental quality.
5. Convey GDOT’s and the DB Team’s commitment to zero tolerance for violations to all workers.
4.2.1.3 Environmental Compliance Inspectors

The Environmental Compliance Inspectors (ECIs) shall conduct on-Site environmental monitoring, prepare documentation, and report to the ECM daily all violations, compliance, and noncompliance with Environmental Approvals.

The ECIs shall report immediately to the ECM any violation or non-compliance and shall include with any such reports, the appropriate recommendations for corrective action including stoppage of Work.

Qualifications: Each ECI shall have at least one (1) year of operational control experience of Water Quality Certification Plan Activities.

4.2.1.4 NEPA Specialist

The ECM shall designate a NEPA Specialist to provide expertise in NEPA laws, regulations, and policies during the course of the Work. In particular, the NEPA Specialist shall be able to address environmental justice (EJ) issues related to the Project, if applicable.

The ECM shall designate personnel in the event that a need arises for renewed activities to comply with environmental laws.

Qualifications: The NEPA Specialist shall meet the certification requirement of GDOT Transportation Planning Prequalification Category 1.06(a) NEPA Documentation.

4.2.1.5 Cultural Resource Management Personnel

The ECM shall designate an Archeologist, Architectural Historian, Historian, and/or Historical Architect to provide expertise in monitoring impacts to cultural resources during the course of the Work.

The ECM shall designate personnel in the event that a need arises for renewed activities to comply with cultural resources laws.

Qualifications: The Cultural Resource Management Personnel shall meet the certification requirement of GDOT Transportation Planning Prequalification Category 1.06(b) History and 1.06(f) Archaeology. Cultural Resource Management Personnel must meet professional standards under regulations developed by the Secretary of the Interior, found at http://www.nps.gov/history/local-law/Prof_Qual_83.htm.

4.2.1.6 Natural Resource Biologist

The ECM shall designate a Natural Resource Biologist to provide expertise in monitoring impacts on wildlife and the natural environment during the course of the Work.

The ECM shall designate personnel in the event that a need arises for renewed activities to comply with natural resources laws.
Qualifications: The Natural Resource Biologist shall meet the certification requirement of GDOT Transportation Planning Prequalification Categories 1.06(e) and 1.06(g).

4.2.1.7 Water Quality Specialist

The ECM shall designate a Water Quality Specialist to provide expertise in permitting delineation, storm water pollution prevention, and the protection of jurisdictional waters during the course of the Work.

Qualifications: The Water Quality Specialist shall have verifiable experience implementing Water Quality Certification Plans and be able to demonstrate a working knowledge of the National Pollutant Discharge Elimination System and MS4 permit requirements applicable to the Project. The Water Quality Specialist shall meet the certification requirements of GDOT Transportation Planning Prequalification Category 1.06(e) and 1.06(g).

4.2.1.8 Air Quality Specialist

The ECM shall designate an Air Quality Specialist to provide expertise for air quality studies during the course of the Work, if necessary.

Qualifications: The Air Quality Specialist shall meet the certification requirement of GDOT Transportation Planning Prequalification Category 1.06(c).

4.2.1.9 Noise Specialist

The ECM shall designate a Noise Specialist to provide expertise for noise studies during the course of the Work, if necessary.

Qualifications: The Noise Specialist shall meet the certification requirement of GDOT Transportation Planning Prequalification Category 1.06(d).

4.2.1.10 Hazardous Materials Manager

The ECM shall designate a Hazardous Materials Manager to provide expertise in the safe handling of Hazardous Materials required to perform the Work and those that may be discovered/impacted during the term of the Agreement. The Hazardous Materials Manager shall conduct appropriate activities such as the following:

1. Schedule and/or conduct training for the DB Team’s employees
2. Verify all employee certifications prior to and required for any handling of Hazardous Materials
3. Maintain records of all incidents involving Hazardous Materials and notify the ECM, GDOT, and appropriate authorities in writing of any such incidents

Qualifications: The Hazardous Materials Manager shall meet the certification requirements of GDOT Soils, Foundation and Material Testing, Hazardous Waste Site Assessment Studies 6.05, and be a qualified professional with forty (40) hours of
HAZWOPER certification. In addition, the Hazardous Material Manager shall have at least five (5) years of experience on similar projects in the following areas:

- Developing investigative work plans, site investigation reports, and remedial action plans or equivalent reports necessary and acceptable to the EPA in material discovery and remediation efforts of Hazardous Materials
- Investigation and remediation of Hazardous Materials following GDOT Environmental Procedures Manual guidelines

4.2.1.11 Worksite Erosion Control Supervisor (WECS)

Before beginning Work, the DB Team shall designate a Worksite Erosion Control Supervisor (WECS) to initiate, install, maintain, inspect, and report the condition of all erosion control devices as described in GDOT Standard Specifications Sections 160 through 171 or in the DBA and erosion, sedimentation and pollution control plan (ESPCP) documents. The designee shall submit their qualifications on the GDOT provided resume form for consideration and approval. The DB Team may utilize additional persons having WECS qualifications to facilitate compliance however, only one WECS shall be designated at a time.

The WECS and alternates shall:

1. Have at least one year of experience in erosion and sediment control, including the installation, inspection, maintenance and reporting of BMPs.
2. Successfully completed the Georgia Soil and Water Conservation Commission Certification Course Level IA and GDOT’s WECS Certification Course.
3. Provide phone numbers where the WECS can be located 24 hours a day.

The WECS’ duties include the following:

1. Be available or have an approved representative available 24-hours a day and have access to the equipment, personnel, and materials needed to maintain erosion control and flooding control.
2. Inform GDOT in writing whenever the alternate WECS assumes project responsibilities.
3. Ensure that erosion control deficiencies are corrected within seventy-two (72) hours or immediately during emergencies. Deficiencies that interfere with traffic flow, safety or downstream turbidity are to be corrected immediately.
4. During heavy rain, have the construction area patrolled day and night, any day of the week to quickly detect and correct erosion or flooding problems before they interfere with traffic flow, safety, or downstream turbidity.
5. Be on the site within three (3) hours after receiving notification of an emergency prepared to positively respond to the conditions encountered. GDOT may handle emergencies without prior notice to the DB Team. GDOT will recover
costs for emergency maintenance work according to GDOT Standard Specifications Subsection 105.15, “Failure to Maintain Roadway or Structures.”

6. Maintain and submit for the Project records, “as-built” Erosion and Sedimentation Control Plans that supplement and graphically depict EC-1 reported additions and deletions of BMPs. The as-built plans are to be accessed and retained at a GDOT facility at all times.

7. The WECS shall maintain a current certification card for the duration of the Project. Recertification of the WECS will be required prior to the expiration date shown on the Certification card in order to remain as Certified Personnel and the WECS for the Project.

8. Ensure that both the WECS and the alternate meet the criteria of this Section 4.2.1.11.

Failure of the WECS or alternate to perform the duties specified in the Contract, or whose performance has resulted in a citation being received from a State or Federal Regulatory Agency, e.g. the Georgia Environmental Protection Division, shall result in one or more of the following:

1. Suspension of the WECS’ certification for a period of not less than 30 days
2. Removal of the Contractor’s Project superintendent in accordance with GDOT specifications subsections 105.05 and 108.05 for a period not less than 14 days
3. GDOT-wide revocation of the WECS certification for a period of 12 months
4. Removal of the Contractor’s Project superintendent in accordance with GDOT specifications subsections 105.05 and 108.05

4.2.2 GDOT Review and Approval of Environmental Documents and Permits

The approval time frames for Environmental Documents are listed in Tables 4-1 and 4-2. The tables below do not include any required public comment period and time for responding to the public comments. Upon receipt of Final Plans covering the technical report study area established in the NEPA Approval, GDOT shall be responsible for developing the technical report addenda and NEPA Approval reevaluations as provided in Tables 4-1 and 4-2. GDOT will coordinate and provide approved documentation to the appropriate Governmental Entities. The review and issuance time periods listed in Tables 4-1 and 4-2 are per agency and may not occur concurrently. GDOT reserves the right to request revisions to the tables as needed to meet Governmental Entity approval. The timeframe for the development of the technical studies and NEPA document reevaluation are subject to the extent of change proposed by the DB Team; therefore, GDOT reserves the right to modify schedule durations as appropriate after receipt of the DB Team’s Preliminary Plans.
Table 4-1: GDOT-Led Environmental Preparation and Approval

<table>
<thead>
<tr>
<th>Document*</th>
<th>Governmental Entity Approval Time Frame</th>
<th>Reviewing Governmental Entity</th>
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<tbody>
<tr>
<td>Environmental Document Reevaluation Approval</td>
<td>Prepare Document: 30 days (from approval of Technical Report Addendum)</td>
<td>GDOT</td>
</tr>
<tr>
<td></td>
<td>Revise Document: 7 days</td>
<td>GDOT</td>
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<tr>
<td></td>
<td>Review period 1: 30 days</td>
<td>GDOT</td>
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<tr>
<td></td>
<td>Review period 2: 14 days</td>
<td>GDOT</td>
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<tr>
<td></td>
<td>Review period 1: 30 days</td>
<td>FHWA</td>
</tr>
<tr>
<td></td>
<td>Review period 2: 14 days</td>
<td>GDOT</td>
</tr>
<tr>
<td>Ecology Report and Addendum</td>
<td>Prepare Survey and Report Addendum: 30 days (from receipt of DB team's preliminary design plans and calculated impacts to resources)</td>
<td>GDOT</td>
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<tr>
<td></td>
<td>Revise Addendum: 7 days</td>
<td>GDOT</td>
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<tr>
<td></td>
<td>Review period 1: 30 days</td>
<td>GDOT</td>
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<td></td>
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<td>45 days (informal Section 7)</td>
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<td>135 days (for formal Section 7)</td>
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<td></td>
<td>45 days (for protected species - for Fish and Wildlife Coordination Act concurrence)</td>
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<td>Revise AOE Addendum: 7 days</td>
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<td>30 days</td>
<td>State Historic Preservation Officer (SHPO)</td>
</tr>
<tr>
<td>Public involvement for noise barrier voting</td>
<td>Logistics, Fieldwork, voting, ballot, tally, and dry run: 45 days</td>
<td>GDOT</td>
</tr>
<tr>
<td></td>
<td>30 days</td>
<td>GDOT</td>
</tr>
<tr>
<td></td>
<td>15 days</td>
<td>FHWA</td>
</tr>
<tr>
<td>Document*</td>
<td>Governmental Entity Approval Time Frame</td>
<td>Reviewing Governmental Entity</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>----------------------------------------</td>
<td>-----------------------------------------------------</td>
</tr>
<tr>
<td>Noise Report and Addendum</td>
<td>60 days</td>
<td>GDOT</td>
</tr>
<tr>
<td></td>
<td>Revise noise report: 21 days</td>
<td>GDOT</td>
</tr>
<tr>
<td></td>
<td>30 days</td>
<td>FHWA</td>
</tr>
<tr>
<td>Air Quality Report and Addendum</td>
<td>Memo to file for no change: 7 days</td>
<td>GDOT</td>
</tr>
<tr>
<td></td>
<td>30 days</td>
<td>GDOT</td>
</tr>
<tr>
<td>Traffic Report and Addendum</td>
<td>45 days</td>
<td>GDOT or FHWA (per Projects of Division Interest (PoDI) Agreement)</td>
</tr>
</tbody>
</table>

*FHWA intends to publish a notice in the Federal Register following NEPA Approval and the Section 404 permit, as applicable. If such a notice is published, claims seeking judicial review of this federal action will be barred unless such claims are filed within one hundred and fifty (150) days after the publication date of the Federal Register notice for each federal action (e.g., NEPA Approval and/or Section 404 permit). At minimum, the period of time may only be limited by the Administrative Procedures Act of 1946 (APA) (5 United States Code [USC] Section 701–706).

The DB Team shall be responsible for preparing required permits and permit modifications as stated in Table 4-2, and shall pay all fees required. The DB Team shall provide to GDOT copies of receipts of delivery of the applications and paid fees to the permitting agencies. For Notice(s) of Termination (NOT), the DB Team shall provide a copy of the acknowledgement of receipt of the NOT by EPD.

The DB Team is responsible to obtain all other permits not included in Table 4-2 to meet the requirements of the DB Documents. GDOT will be responsible for reviewing the permits and permit modifications and submitting to the appropriate Governmental Entities, unless the applicant is listed as the DB Team. Documentation not meeting current submission standards or requirements of Governmental Entities will be returned to GDOT, and shall be revised by a qualified independent consultant approved by GDOT at DB Team’s cost. GDOT reserves the right to review, comment on, require revisions to, and reject for resubmission documentation submitted to GDOT by the independent consultant or the DB Team for environmental compliance or approval. The agency review time frame for permits is specified in Table 4-2. The review and issuance time periods listed in Table 4-2 for DB Team-led approvals do not apply to any revisions of the new permit applications proposed by the DB Team’s Conceptual Layout Plan of Project.
### Table 4-2: DB Team-Led Environmental Permit Approval

<table>
<thead>
<tr>
<th>Permit Required</th>
<th>Agency Review and Issuance Time Period (Calendar Days)***</th>
<th>Listed Applicant</th>
<th>Preparer of Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States Army Corps of Engineers (USACE) Section 404</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>* Section 404 General Permit</td>
<td>140</td>
<td>GDOT</td>
<td>DB Team</td>
</tr>
<tr>
<td>** Section 404 Individual Permit</td>
<td>240</td>
<td>GDOT</td>
<td>DB Team</td>
</tr>
<tr>
<td>Subsurface testing of all Underground Storage Tanks and Hazardous Materials</td>
<td>150</td>
<td>GDOT</td>
<td>DB Team</td>
</tr>
<tr>
<td>National Pollutant Discharge Elimination System (NPDES) Construction General Permit (GAR100002), Notice of Intent (NOI)</td>
<td>14</td>
<td>DB Team</td>
<td>DB Team</td>
</tr>
<tr>
<td>NPDES Construction General Permit (GAR100003), Notice of Intent (NOI)</td>
<td>90</td>
<td>DB Team</td>
<td>DB Team</td>
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<tr>
<td>NPDES Construction General Permit (GAR150000), Notice of Termination (NOT)</td>
<td>90</td>
<td>DB Team</td>
<td>DB Team</td>
</tr>
<tr>
<td>Georgia Stream Buffer Variance</td>
<td>150</td>
<td>GDOT</td>
<td>DB Team</td>
</tr>
</tbody>
</table>

* This applies to Section 404 permitting and if additional impacts are incurred after the permit has been approved, a new permit that covers all impacts is required and the original review times apply to the new permit. No work is authorized in the areas of the previous permit until the new permit is approved and construction authorization is received.

** This applies to Section 404 permitting impacts which may exceed the cumulative threshold for a General Permit.

*** The review and issuance time periods shall commence once a completed permit package that complies with the requirements of the DB Documents is accepted by GDOT and submitted to the issuing agency and end once the permit is issued by the appropriate Governmental Entity. Therefore, the DB Team shall schedule several review periods to ensure proper planning to accomplish the entire process for each required permit. Each GDOT review period is thirty (30) days. Should the Submittal not be complete or rejected as provided in Section 3, each subsequent review period shall be fifteen (15) days, and is excluded from the timeframe in Table 4-2 above.
The above permits and review times do not contemplate offsite plant or other offsite activity that the DB Team may propose for use in construction or other non-permanent construction.

The DB Team shall be responsible for payment of any fines incurred as a result from failure to obtain any necessary permits or approvals, and/or for any fines levied as a result of inadequate or improper installations.

### 4.3 Comprehensive Environmental Protection Program

The DB Team shall adopt a proactive approach for overseeing and inspecting environmental Work during construction to help guard against unanticipated impacts to the environment. The DB Team shall be responsible for complying with the scope of environmental commitments (Environmental Commitments Table) from the Environmental Documents, including the NEPA/GEPA document, Special Provision Section 107.23(H), environmental permits, and other environmental approvals.

To that end, the DB Team shall develop, execute, and maintain a Comprehensive Environmental Protection Program (CEPP) for the Work to ensure environmental compliance with all applicable environmental laws and commitments. The CEPP shall obligate the DB Team to protect the environment and document the measures taken during the performance of the Work to avoid, minimize, and mitigate impacts on the environment from the design and construction activities of the Project. The CEPP shall effectively demonstrate in detail the DB Team’s knowledge of all applicable Project-specific Environmental Approvals, issues, and commitments, as well as applicable environmental laws, as set forth in Volume 2 and Volume 3. It shall also describe the processes that will be followed during the course of the Work to comply with those Environmental Approvals, issues, and commitments and laws, as well as the documentation required to validate compliance. All monitoring and reporting activities shall be concise and consistent throughout the term of the Agreement as applicable to the activities being performed, and shall be in accordance with the requirements set forth in the environmental laws. The CEPP shall also effectively describe the quality control and assurance measures that the DB Team will implement to verify the compliance of the CEPP with all applicable environmental laws. The CEPP shall establish a goal of zero environmental violations during the performance of all Work activities while meeting each regulatory agency’s permitting requirements. However, should violations occur, the CEPP shall set forth detailed processes for rectifying such violations in an appropriate and timely manner.

### 4.4 Hazardous Materials Management Plan

The DB Team shall prepare a Hazardous Materials Management Plan (HMMP) for the safe handling, storage, treatment, and/or disposal of Hazardous Materials, whether encountered at or brought onto the Project Site by the DB Team, encountered or brought onto the Project Site by a third party, or otherwise, during the term of the Agreement. The
DB Team shall submit the final HMMP to GDOT for review and approval within sixty (60) days of NTP 1; approval of the Plan by GDOT shall be a condition of commencement of Construction Work. The DB Team shall follow the federal Environmental Protection Agency (EPA), EPD guidelines, and GDOT Policies and Procedures for Underground Storage Tank (UST), and Hazardous Waste (HW) Site Investigation Procedure.

The DB Team’s HMMP shall include procedures compliant with all applicable environmental laws and shall include, at a minimum:

1. Updated Material Safety Data Sheets (MSDS) for all chemicals to be used on the Project, per OSHA requirements, for the term of the Agreement
2. Designated individuals responsible for implementation of the plan
3. Procedures for identifying and documenting potential contaminated sites that might impact Project development
4. Procedures for mitigation of known contaminated sites anticipated to impact construction
5. Procedures for mitigation of unanticipated contaminated sites encountered during construction
6. Procedures for developing a detailed Spill Response Plan for the term of the Agreement
7. Process for training personnel for responding to and mitigating incidents involving contamination or waste
8. Provisions for appropriate storage and disposal of all waste encountered or disposed of on the Project for the term of the Agreement
9. Provision for a Hazardous Materials training module as an element of the EPTP component of the CEPP
10. Procedures for preparing Underground Storage Tank/Hazardous Waste (UST/HW) site investigation report(s) and package submittals to the Environmental Testing Unit of the Office of Materials and Testing (OMAT) for review in the event that Hazardous Materials are discovered during construction
11. Identification and contact information for designated responsible individuals

The HMMP shall include provisions for making all workers aware of the potential Hazardous Materials to which they may be exposed, limiting Contractors and other Site workers’ exposure to Hazardous Materials and providing all necessary personal protection equipment to protect workers from exposure. The HMMP shall require the DB Team to provide any non-DB Team personnel who visits the Project area with the appropriate personal protection equipment.

The HMMP shall require that all personnel of the DB Team-Related Entities handling Hazardous Materials be trained and certified at least to the minimum requirements established under the current guidelines of OSHA 1910.120 (HAZWOPER Training).
Further, the HMMP shall include procedures for ensuring that all applicable certifications, licenses, authorizations, and Governmental Approvals for the DB Team personnel handling Hazardous Materials are current and valid through the duration of the Work.
5  RESERVED
6 UTILITY ADJUSTMENTS

6.1 General

By Georgia Statutes, utilities, whether publicly or privately owned, aerial or underground, are permitted by GDOT and local governments to be accommodated within the public Right of Way. To this end, the DB Team shall make every effort to avoid utilities. Design/construction techniques that minimize or avoid utility conflicts may involve increased upfront costs; however, those costs may be offset by savings during construction, in addition to the total cost savings for the Project, GDOT, and the respective Utility Owners. This Section 6 establishes procedures and requirements for Utility Adjustments including such processes as coordination with Utility Owners, administration of the engineering, construction and other activities necessary for Utility Adjustments, and required documentation.

The Utility Plans are a valuable tool used to identify and resolve utility related conflicts/issues prior to beginning the construction of a Project. Also, when these plans are properly prepared per guidance in this Section 6, they will support the vital coordination required between the DB Team and the Utility Owner during construction.

6.1.1 Standards


6.1.2 Memorandum of Understanding (MOU)

The allocation of responsibility for the Utility Adjustment work will be specified in the MOU. GDOT has executed MOUs between GDOT and each Utility Owner. Copies of the MOUs can be found in the attachments to Volume 2 Section 6. If a Utility is impacted by the Project and the impact requires a relocation of the Utility, refer to the executed MOU for the Party responsible for the cost of the relocations. See Section 6.1.3.6 regarding the DB Team cost responsibilities for each MOU.

The DB Team shall cause Utility Adjustments to occur either by coordinating the relocation with the Utility Owner self-performing the relocation work, performing the work with its own forces or by using the Utility Owner’s Pre Approved Design Consultants or Contractors.
6.1.3 Responsibilities of the DB Team

The DB Team shall cause all Utility Adjustments necessary to accommodate the Project.

6.1.3.1 DB Team Pre-Construction Coordination

The DB Team shall communicate, cooperate, and coordinate with GDOT, the Utility Owners, Utility Owner’s design consultants and construction contractors, property owners, local Governmental Entities, locally impacted businesses, and potentially affected third parties, as necessary for performance of the Utility Adjustment Work. The DB Team shall provide advance notification to all impacted local Governmental Entities, business and property owners for and planned disruption of service. The DB Team shall coordinate with GDOT for any public outreach for planned utility disruptions as required. The DB Team shall be responsible for assisting in the preparation of all Standard Utility Agreement(s) (SUA) and Contract Item Agreement(s) (CIA) as required. Utility agreement templates can be acquired from the State Pre-Construction Utility Manager. As part of the Pre-construction coordination, the DB team will be required to coordinate with all utility permitting agencies within the Project limits to ensure that any utility permits issued by any agency are reviewed and approved by the DB Team. The DB Team shall notify the Utility Owners that a Georgia Utility Permitting System (GUPS) permit is required for any facilities located inside the Project limits.

All Utility coordination shall be performed to GDOT standards by a prequalified firm in Area Class 3.10 - Utility Coordination. Refer to the following website for a list of current prequalified firms:

http://www.dot.ga.gov/PS/Business/Prequalification/PrequalConsultants

The DB Team utility coordination shall include, but not be limited to the following:

1. The DB Team shall schedule and meet with all Utility Owners with facilities located within the Project limits, GDOT’s District Utilities Office, and the State Subsurface Utilities Engineer (or designee) for a utility kick-off meeting within 15 days of NTP 1. The DB Team shall discuss schedule, provide a Project overview and provide Utility Owners with a clear understanding of Design-Build Utility Coordination processes and what the Utility Owners can expect for the duration of the Project.

2. Contacting each Utility Owner to advise of the proposed Project; and obtaining supplemental verification of the locations of existing utility facilities (including the employment of additional Overhead/Underground Subsurface Utility Engineering (SUE) investigations as needed in determining requirements for the relocation or adjustment of facilities.

3. The DB Team shall perform any and all coordination necessary for Utility Adjustments.


6.1.3.2 DB Team Design Activities

The DB Team shall be responsible for the following design activities:

1. The DB Team shall be responsible for collecting the following from each Utility Owner self-performing their relocation work within the Project limits: Utility relocation plans; Utility agreements if required; and cost estimates and letters of “no conflict” where the Utility Owner’s facilities will not be impacted by the Project.

2. The DB Team shall prepare all engineering design, plans, and technical specifications required to perform the necessary utility relocations.

3. The DB Team shall be responsible for coordinating the design work of its subcontractors, Utility Owners and/or Utility Owners’ contractors. This shall include any required inspection, permitting, testing and monitoring to ensure that the Work is properly performed in accordance with approved design plans.

4. The resolution of any conflicts between Utilities and the construction of the Project shall be the responsibility of the DB Team.

5. No additional compensation will be allowed for any delays, inconveniences, or damage sustained by the DB Team or its Subcontractors due to interference from Utilities or the operation of relocating utilities.

6. The DB Team shall provide each Utility Owner with roadway design plans and preliminary utility plans as soon as the plans have reached a level of completeness adequate to allow the Utility Owner to fully understand the Project impacts. The Utility Owner or Utility Owner’s design consultant will use the DB Team’s design plan for preparing Utility relocation plans, cost estimates, and respective Utility Adjustment Schedules (UAS).

7. The DB Team shall assist Utility Owners in the preparation and submittal to GDOT a Utility Work Plan Retention Request for any utility that is to remain under the roadway within the construction limits.

8. If a party other than the Utility Owner prepares Utility relocation plans, there shall be a concurrence box on the plans where the Utility Owner signs and accepts the Utility relocation plans as shown.

9. The DB Team shall review the utility plans to identify that there are no conflicts with the proposed highway improvements, and ensure that there are no conflicts between each of the Utility Owner’s relocation plans.

10. The DB Team shall show all existing and proposed utilities on the cross sections and drainage profiles.

11. The DB Team shall furnish the final utility relocation plans to each utility owner to incorporate into the GUPS Project permit. Once the GUPS Project permit is submitted, GDOT will forward to the DB Team for concurrence.

12. The DB Team shall review all utility relocation plans, Utility agreements, utility estimates, and certificates of eligibility to ensure that relocations comply with GDOT’s Utility Accommodation Policy and Standards Manual.
13. The DB Team shall certify to GDOT that utility relocation design plans have been reviewed and accepted by the respective Utility Owner.

### 6.1.3.3 DB Team Construction Activities

The DB Team shall cause Utility Adjustments to occur either by the Utility Owner, the Utility Owner’s pre-approved contractors or by self-performing the construction Work.

The DB Team Utility Work construction management shall be performed by the Worksite Utility Coordination Supervisor.

#### 6.1.3.3.1 Delays

Under no circumstances will the DB Team be entitled to any additional compensation or time extension hereunder as the result of any Utility Adjustment, whether performed by the DB Team or by the Utility Owner, except as provided in Article 14 of the DBA.

### 6.1.3.4 General Responsibilities of GDOT

GDOT will provide guidance to the DB Team in the Utility Adjustment process to the extent as described in the Design-Build Documents and the Utility Accommodation Policy and Standards Manual.

### 6.1.3.5 Utility Adjustment Relocation

The DB Team shall be responsible for all Utility Adjustment Work associated with the Project, with the exception of Betterment and items explicitly excluded within the MOU’s.

### 6.1.3.6 When Utility Adjustment is Required

Utility Adjustment may be necessary to accommodate the Work for either or both of the following reasons: (i) a physical conflict between the Work and the Utility, and/or (ii) an incompatibility between the Work and the Utility, even though there may be no physical conflict. The physical limits of all Utility Adjustments shall extend as necessary to replace the existing Utility, whether inside or outside of the Existing ROW and Proposed ROW. Section 6.2.2.2 (Acquisition of Replacement Utility Property Interests) contains provisions that address the acquisition of easements for Utilities to be installed outside of the Existing ROW and Proposed ROW.

### 6.1.4 Certain Components of the Utility Adjustment Work

#### 6.1.4.1 Betterments

Replacements for existing Utilities shall be designed and constructed to provide service at least equal to that offered by the existing Utilities, unless the Utility Owner specifies a lesser replacement or unless a larger size is required to meet current Law, industry standards, or Code. Services include equal access and ability to maintain the facility at its current level of functionality; in other words, like for like in-kind replacement and in accordance with the UAM and GDOT Design Policies.
Any Betterment work furnished or performed by the DB Team as part of a Utility Adjustment shall be deemed added to the Work. That proportion of the costs representing improvement or Betterment in a facility shall be excluded from the costs eligible for payment by the DB Team or participation by GDOT, unless required to meet Law, industry standards, or Code.

The DB Team shall pay the in-kind replacement costs or larger facility costs if required to meet current Law, industry standards, or Code for removing, adjusting, and relocating those facilities that are physically in place and in conflict with proposed construction and where replacement is necessary.

6.1.4.2 Protection in Place

The DB Team shall assist the Utility Owner in the submission of Retention Request to GDOT for review and acceptance for each utility that will remain in place in accordance with GDOT’s Utility Accommodation Policy and Standards Manual. The DB Team shall be responsible for Protection in Place through the use of a GDOT approved Utility Work Plan Retention Request of all Utilities impacted by the Project as necessary for their continued safe operation and structural integrity.

6.1.4.3 Early Adjustments

Refer to Volume 2.

6.2 Administrative Requirements

6.2.1 Communications

6.2.1.1 Communication with Utility Owners: Meetings and Correspondence

The DB Team is responsible for holding meetings and otherwise communicating with each Utility Owner and/or sub-contractor and/or the Utility Owner's pre-approved design consultant and construction contractor as necessary to timely accomplish the Utility Adjustments in compliance with the DB Documents. GDOT may participate in these meetings if requested by the Utility Owner or the DB Team or otherwise as GDOT deems appropriate.

At least seven (7) days in advance of each scheduled meeting, the DB Team shall provide notice and an agenda for the meeting separately to GDOT and the appropriate Utility Owner. The DB Team shall prepare and distribute minutes of all meetings within seven (7) days of the meeting with Utility Owners and shall keep copies of all correspondence between the DB Team and any Utility Owner.

The DB Team will be allowed to coordinate with Utility Companies for early coordination of Utility Adjustments.
6.2.2 **Real Property Matters**

The DB Team shall provide the services described below in connection with existing and future occupancy of property by Utilities.

**Determination of Utility Right-of-Way and Easement** – The determination as to the need for replacement right-of-way or easement for utilities will be made as follows:

1. GDOT will determine what right-of-way is required for construction of the Project and will normally provide adequate right-of-way for the existing or typical utility facilities that will be permitted to be accommodated within that right-of-way. The DB Team will coordinate with each Utility to request any special right-of-way requirements necessary for their facilities.

2. If there is not sufficient space for the utility within the right of way or easement that will be required for the construction of the Project, the DB Team will coordinate with the Utility Owner to verify such circumstance and will obtain a written statement as to whether the Utility Owner desires that the DB Team acquire such additional rights of way or easement as may be required for utility relocation under the provisions of the O.C.G.A. § 32-6-172.

3. If the Utility Owner intends to acquire its own right of way or easement:
   a. The DB Team shall obtain written notification from the Utility Owner of such decision including this acquisition in the Utility Owner’s Work Plan.
   b. The DB Team shall notify the GDOT Project Manager of that status in a format that will be included in GDOT’s monthly Right of Way Status Acquisition Reports.
   c. The DB team shall request from the State Right of Way Office, and forward to such Utility Owner, the Right of Way Status Acquisition Report.

**Method of Acquisition** - The method of acquisition described in Section 4.1.C.6 of the UAM shall apply. It is desirable that replacement right of way and easements for utilities be acquired concurrently with acquisition of right of way for the Project.

**Adjustment on Projects**

1. **Reimbursable Cases** - When the Utility Owner is entitled to reimbursement for the cost of acquisition of replacement right of way or easements, GDOT will request permission from the Utility Owner, which must be obtained in writing, to acquire necessary utility right of way or easements concurrently with its acquisition of the normal highway right of way. If the Utility Owner has some particular reason for insisting on acquiring the right of way or easement, this will be included in a Standard Utility Agreement.

2. **Non-Reimbursable Cases** - If the cost of acquisition of replacement right of way or easement is not reimbursable, GDOT will, at the written request of the Utility Owner, acquire such right of way or easement under written agreement and the Utility Owner will reimburse GDOT for such cost in accordance with the State Law.
Any acquisition by GDOT will comply with all requirements pertaining to GDOT's acquisition of its own right of way or easement.

**Interest to be Acquired** - If the Utility Owner agrees for the DB Team to acquire replacement right of way, or easement:

1. The DB Team in conjunction with GDOT's Office of Right of Way will determine what interest will be acquired and the instrument (i.e., quitclaim, easement limited agreement, etc.) to be used to transfer such interest from GDOT to the Utility Owner.
2. The State Right of Way Administrator will notify the DB Team, District Utility Manager and the State Utilities Office as to a determination regarding GDOT's agreement to acquire the right of way and of what interest is proposed to acquire.
3. The DB Team will notify the Utility Owner and District Utility Manager of that determination and will promptly notify the State Right of Way Office, with a copy to the State Utilities Administrator, of any exceptions the Utility Owner may make to that determination.
4. The State Utilities Administrator will be responsible for the establishment of Easement Limited Agreements (ELA) with the Utility Owner after determination by the State Right of Way Administrator that such ELA is required to complete the rights of way acquisition. A copy of the ELA will be sent to the State Right of Way Office for legal recording.

### 6.2.2.1 Documentation of Existing Utility Property Interests – Affidavits

For each Existing Utility Property Interest within the Existing ROW and Proposed ROW claimed by any Utility Owner, the DB Team shall include an easement deed or an Affidavit of Property Interest in the applicable Utility Work Plan, with appropriate documentation of the Existing Utility Property Interest attached. Any such claim shall be subject to GDOT's acceptance as part of a Utility Work Plan review. Except as otherwise directed by GDOT, the DB Team shall prepare all Affidavits of Property Interest using the standard GDOT form.

### 6.2.2.2 Acquisition of Replacement Utility Property Interests

Each Utility Owner will be responsible for acquiring any Replacement Utility Property Interests that are necessary for its Utility Adjustments if the DB Team is not responsible as outlined in the MOU. For acquisitions not the responsibility of the DB Team, the DB Team shall have the following responsibilities for each acquisition:

1. The DB Team shall coordinate with, and provide the necessary information to, each Utility Owner as necessary for the Utility Owner to acquire any Replacement Utility Property Interests required for its Utility Adjustments.
2. If any of the DB Team-Related Entities assists a Utility Owner in acquiring a Replacement Utility Property Interest, such assistance shall be by separate
contract outside of the Work, and the DB Team shall ensure that the following requirements are met:

a. The files and records must be kept separate and apart from all acquisition files and records for the Proposed ROW and Additional Properties.

b. The items used in acquisition of Replacement Utility Property Interests (e.g., appraisals, written evaluations and owner contact reports) must be separate from the purchase of the Proposed ROW and Additional Properties.

c. Any DB Team Related Entity personnel negotiating the acquisition of Replacement Utility Property Interests must be different from those negotiating the acquisition of Project ROW.

Condemnation: The DB Team is not responsible for Utility Owner condemnation proceedings.

6.2.2.3 Georgia Utility Permitting System (GUPS)

The DB Team shall submit, or shall ensure that each Utility Owner submits, utility permit requests through GUPS for the following:

1. Each Utility proposed to be relocated within the Existing ROW, Proposed ROW and Additional Properties.

2. Each Utility proposed to remain in its existing location within the Existing ROW, Proposed ROW and Additional Properties.

6.2.2.4 Documentation Requirements

The DB Team shall prepare, negotiate (to the extent permitted by this Section 6.2.2 (Real Property Matters), and obtain execution by the Utility Owner of (and record in the appropriate jurisdiction, if applicable) all agreements and deeds described in this section, including all necessary exhibits and information concerning the Project (e.g., reports, Plans, and surveys). Each agreement or deed shall identify the subject Utility(ies) by the applicable Utility Permit Number, and shall also identify any real property interests by parcel number or highway station number, or by other identification acceptable to GDOT.

6.2.2.5 Record Keeping

The DB Team shall maintain design, construction and inspection, and other Utility related records in order to ascertain that Utility Adjustment Work is accomplished as required by the Design-Build Documents and the applicable Utility agreement(s).
6.3 Design

6.3.1 DB Team’s Responsibility for Utility Identification

All Design Documents for Utility Adjustment Work, whether furnished by the DB Team or by the Utility Owner or pre-approved design consultant, shall be consistent and compatible with the following:

1. The applicable requirements of the DB Documents, including Section 6.1.1 (Standards)
2. Any Utilities remaining in, or being installed in, the same vicinity
3. All applicable Governmental Approvals
4. Private approvals of any third parties necessary for such work

The DB Team shall ensure that the Design Documents are complete and include all utility adjustment schedules (required only if the Utility Owner self performs), utility relocation plans, and associated agreements (if required) necessary to address all foreseeable utility impacts that might affect the Project. This includes utility issues affecting right of way acquisition, environmental clearances, project staging, and project constructability.

The DB Team shall endeavor to design the Project to avoid conflicts with utilities when feasible, and minimize impacts where conflicts cannot be avoided. The DB Team shall submit to GDOT a SUE Utility Impact Analysis (UIA) in GDOT’s prescribed format as specified in Volume 2, Section 3, Table 3-1.

When a Utility Owner claims prior rights in the MOU and does not include either design or construction in the Design-Build Documents, the DB Team shall research and verify any compensable prior right claimed in the MOU that would result in reimbursement to the Utility Owner for any relocation design, construction or material cost. If there is a dispute over property interests with a Utility Owner, the DB Team shall be responsible for resolving the dispute. The DB Team shall meet with GDOT’s District Utilities Manager to present the property interests information gathered. This information shall be sufficient for the District Utilities Manager (or designee) to certify the extent of the Utility Owner’s property interests. GDOT shall have final approval authority as to the DB Team’s determination of whether the Utility Owner has property interests. The DB Team will be responsible for all design, construction and material costs when the design and construction are included in the Design-Build Documents.

6.3.2 Utility Relocation Plans

The DB Team shall submit final Utility Relocation Plans after the DB Team has reviewed and addressed GDOT or GDOT representative internal comments on the Utility Adjustment Preliminary Plan.
6.3.2.1 Plans Prepared by the DB Team

Where the DB Team and the Utility Owner have agreed that the DB Team will furnish a Utility Adjustment design, the DB Team shall prepare final Utility Relocation Plans and have an authorized representative of the Utility Owner sign the plans as “reviewed and approved for construction.” The Utility Work Plan (as approved by the Utility Owner) shall be attached to the applicable Utility Agreement (if required), for GDOT’s approval.

Unless otherwise specified in the applicable Utility Agreement(s), all changes to final Utility Relocation Plan(s) previously approved by the Utility Owner (excluding estimates, if the Utility Owner is not responsible for any costs) shall require written Utility Owner approval. The DB Team shall transmit any GDOT comments to the Utility Owner, and shall coordinate any modification, re-approval by the Utility Owner and re-submittal to GDOT as necessary to obtain GDOT’s approval.

6.3.2.2 Plans Prepared by the Utility Owner

For all Utility Adjustments to be furnished by a Utility Owner, the DB Team shall coordinate with the Utility Owner as necessary to confirm compliance with the applicable requirements. Those Utility Adjustments shall be attached to the applicable Utility Agreement (if required), which the DB Team shall include in the appropriate Utility Work Plan for GDOT’s acceptance. The DB Team shall transmit any GDOT comments to the Utility Owner, and shall coordinate any modification, review by the DB Team and re-submittal to GDOT as necessary to obtain GDOT’s acceptance.

6.3.2.3 Design Documents

Each proposed Utility Adjustment shall be shown in the Design Documents, regardless of whether the Utility Relocation Plan is prepared by the DB Team, Utility Owner or Utility Owner’s design consultant.

Required Information

1. Preliminary Utility Relocation Plans

   1. Preliminary Utility Relocation Plan sheets are typically comprised of preliminary roadway plan sheets with the inclusion of all existing utility facility locations (overhead and underground) found within a Project’s limits. The “degree of effort” exerted on the part of GDOT and the Utility Owner varies with the type and location of the utility. GDOT has classified these “degrees of effort” into different quality levels of information.

   2. Preliminary Utility Relocation Plans shall be produced and used by the DB Team in the utility coordination/relocation design activities outlined here. The following minimum information shall be shown on the Preliminary Utility Plans:
3. Construction centerlines with Project stations and begin/end Project limits
4. Curb and gutter or edge of pavement (proposed and existing)
5. Road and street names
6. Existing and required Right of Way limits, property lines, environmentally sensitive area limits, and property owners
7. All proposed and existing easements (including existing utility easements)
8. Proposed and existing drainage structures/features (excluding drainage text)
9. Proposed construction limits (C/F lines)
10. Topographical planimetrics (i.e., existing buildings/structures, existing tree/vegetation limits)
11. All proposed bridges, walls, other structures and landscape hardscapes
12. All proposed and existing strain poles (signal, sign, lighting)
13. Utilities Legend
14. Miscellaneous General Notes
15. Existing overhead and underground utilities found within the Project’s limits, including size and material if known
16. Sanitary sewer manhole top, and invert elevations. Sanitary Sewer pipe flow directions
17. Railroad mainline and spur tracks with their respective property/easement limits
18. Project survey control point locations

2. Final Utility Relocation Plans
   1. The final Utility Relocation Plans shall clearly show all existing utilities on the plans and clearly indicate all existing utilities are “To Remain” and all proposed relocations necessary to avoid construction conflicts.
   2. In addition to the information required for the Preliminary Utility Relocation Plans, the final Utility Relocation Plans shall include: Miscellaneous General Notes required for coordination of utility facilities with roadway construction.

Sheet Layout

1. The DB Team will ensure that any information and graphic data that is not necessary to depict the disposition of utilities found within the Project’s limits is
removed by turning off the appropriate CAD levels(s) on which the data is stored. This will help ensure that information pertinent to utility facilities can be clearly seen in the Utility Plan sheets. Examples of extraneous information would be items such as horizontal curve data, superelevation data, roadway dimensions, misc. text, etc. All background information such as pavement limits, existing structures, etc. shall be screened back. Also, the DB Team shall ensure all text, line work, details, and symbols are clear and legible when plans are reduced to half-size (typically, 11” x 17”).

2. In order to maintain plan clarity, all applicable general notes, tables, details, and the Utility Legend shall be placed separately from the Utility Plan sheets. A Utility Plan “Cover Sheet” shall be provided for both preliminary and final Utility Relocation Plans. A recommended example utility sheet schedule is provided below:

1. Utility Sheet 1 (Cover Sheet) – Utility General Notes, Utility Legend, Miscellaneous Details
2. Utility Sheet 2 (required as needed) – Additional Miscellaneous Details, Pole Data Table
3. Utility Plan Sheets – Utilities shown in plan view with respect to Project shall be displayed on 24 Series Plan Sheets.
4. Utility Profile and Cross Sections Sheets - Proposed Utility facility profiles and cross sections (as required)
5. Miscellaneous Utilities Sheets – Miscellaneous proposed utility details (as required)

The above sheet schedule shall also be generally followed for all separate utility relocation plans (i.e., water and sewer plans) included in the Project plans.

The DB Team shall note on the Utility Relocation Plans whose responsibility it is for utility adjustment. For bridge plans required, the DB Team shall ensure the plans have made accommodations for utility crossings and attachments, if applicable. Any new utility crossings requests shall include the size, weight, and type of utility. In addition, the method of attachment to the bridge shall be fully detailed. Such requests shall be reviewed by the DB Team to ensure adequacy and constructability and final acceptance shall be obtained by the DB Team from GDOT. The DB Team shall follow the approval process within this specification. The DB Team is responsible to ensure that all proposed and existing utilities are coordinated with the respective Project’s Construction Staging Plans and Erosion Control Plans.

Upon completion of the Utility relocation plans, the DB Team shall ensure that any additional environmental impacts due to utilities are addressed in the Project’s Environmental Document and/or Permit.
6.3.2.4 Certain Requirements for Underground Utilities

Casing as specified in the Utility Accommodation Policy and Standards Manual shall be used for all underground Utilities crossing the Existing ROW, Proposed ROW and/or Additional Properties.

The WUCS shall ensure that all Georgia 811 requirements are met.

6.3.2.5 Utility Work Plan

Utility Work Plan means the combination of the Utility Relocation Plans and the Utility Adjustment Schedule (if required), and any required agreements, specifications, cost estimates (if required), and any other information and materials which the Design-Build Team is required to submit to GDOT in connection with each Utility Relocation. The Utility Work Plan also includes the Utility Owner's approval of plans, specifications, and cost estimates (if required). The term Utility Work Plan also refers to Supplemental Utility Work Plans and Utility Work Plan Retention Requests.

Each Utility Adjustment (as well as each Utility remaining in place and not requiring any Protection in Place or other Utility Adjustment) shall be addressed in a Utility Work Plan prepared by the DB Team and submitted to GDOT for its review and acceptance. The DB Team shall provide Utility Work Plans for each individual Utility Owner and the Utility Work Plan shall be provided in accordance with the Utility Accommodations Policy and Standards Manual. The DB Team shall coordinate with the Utility Owner or Utility Owner's design consultant to prepare all components of each Utility Work Plan. Completion of the review and comment process for the applicable Utility Work Plan, as well as issuance of any required GDOT acceptances, shall be required before the start of construction for the affected Utility Adjustment Work.

Provisions governing the procedure for and timing of Utility Work Plan submittals are in Section 6.5.

All Utility Adjustments covered by the same initial Utility Agreement shall be addressed in a single full Utility Work Plan.

6.3.2.6 Utility Adjustment Schedule (UAS)

The purpose of the UAS is to provide the DB Team with the pertinent information when Utility Owners are self-performing. When the DB Team is performing the relocation work or if the relocation work has been included in the contract to be accomplished by the Utility Owner pre-approved contractor, no UAS will be required, unless there is a dependent activity by the Utility Owner to facilitate this work.

The DB Team shall schedule all utility relocations and adjustments. The DB Team shall obtain a written schedule from the Utility Owner or a Utility Owner pre-approved contractor.
6.3.2.7 Revised Work Plan Acceptance

If previously unforeseen utility removal, relocation, or adjustment work is found necessary by the DB Team, the Utility, or the DB Team after the start of construction of a project, the DB Team shall obtain from the Utility (if self-performing) a revised Utility Work Plan within 30 days after becoming aware of such work or upon receipt of the DB Team’s written notification advising of such work. The incorporation of this revised Utility Work Plan into the overall project schedule is not intended to correct errors and omissions with the original or current accepted Utility Work Plans submitted to GDOT. If such errors or omissions occur, it will be the Utility’s responsibility to adhere to the original or current Utility Work Plan submitted and approved. However, when it is deemed appropriate for a revised Utility Work Plan to be submitted, the following procedure shall be followed for its acceptance:

1. The DB Team shall review all revised Utility Work Plans submitted by the Utility found within a project’s limits.

2. After review and acceptance, the revised Work Plan shall be submitted to GDOT for review and acceptance by the District Utility Manager. Note that the District Utility Manager will typically consult with the District Construction Office and GDOT Project Manager to determine the reasonability of such revised Work Plans. If, upon review, the District Utilities Manager determines a revised Work Plan to be unreasonable based on the required scope of Utility Adjustment and/or relocation required to accommodate a project, the District Utility Manager will initiate the escalation process to resolve such disputes involving the revised Utility Work Plan if disputes occur.

6.3.2.8 Post-Let Utility Certification

The DB Team shall develop the Preliminary Utility Status Report. This report shall include a listing of all Utility Owners located within the Project limits and a recommendation as to the extent of each Utility Owner’s property interests. This report shall include copies of easements, plans, or other supporting documentation that substantiates any property interests of the Utility Owners. The report shall list each Utility Owner with contact information, any Utility Agreements, current UIA, and a preliminary assessment of the impact to each Utility Owner.

Upon receipt of the accepted utility relocation plans and the Preliminary Utility Status Report, the DB Team will review and forward that information to the District Utility Manager for review. The District Utility Manger will review the information and forward to the State Pre-ConSTRUCTION Utility Manager for final acceptance. The State Pre-Construction Utility Manager will perform the post-let utility certification and issue notice to proceed (NTP 3) released for construction.
6.4 Construction

6.4.1 Reserved

6.4.2 General Construction Criteria

At the time the DB Team notifies GDOT that the DB Team deems the Project to have reached Substantial Completion, the DB Team shall certify to GDOT that all Utilities have been identified and that those Utility Owners with property interests or other claims related to relocation or coordination with the Project have been relocated or their claims otherwise satisfied or shall be satisfied by the DB Team.

In addition to the above, the DB Team shall comply with all provisions set forth under subsection 107.21 of the Georgia Department of Transportation’s Specifications, Construction of Transportation Systems, current edition.

All Utility Adjustment construction performed by the DB Team shall conform to the requirements listed below. If the Utility Owner chooses to perform their own relocations and the Utility Owner holds no property interest, the DB Team shall obtain written confirmation from the Utility Owner stating that the Utility Owner will relocate its own facilities at no cost to the DB Team. All construction engineering and contract supervision shall be the responsibility of the DB Team to ensure that all utility relocation work included in the contract is accomplished in accordance with the Utility Owner approved final design plans and specifications. The DB Team will consult with the Utility Owner before authorizing any changes that affect the Utility Owners facilities. For work included in the DB Team’s contract, the Utility Owner or Utility Owner’s contractor shall have the right to visit and inspect the work at any time and advise the DB Team and GDOT of any observed discrepancies or potential issues. The DB Team will notify the Utility Owner when all utility relocation work is completed and ready for final inspection. Upon final acceptance of the utility relocation included in the contract and upon certification by the Utility Owner that the work has been completed in accordance with the Utility Owner approved final design plans and specifications, the Utility Owner will accept the adjusted, relocated, and additional facilities. In addition, the DB Team is responsible for verifying that all Utility Adjustment construction performed by each Utility Owner conforms to the requirements described below. In case of nonconformance, the DB Team shall cause the Utility Owner (and/or its contractors, as applicable) to complete all necessary corrective work or to otherwise take such steps as are necessary to conform to these requirements:

1. All criteria identified in Section 6.3

2. The Utility Work Plan(s) included in the Utility Agreements approved by GDOT (other than Utility Adjustment Field Modifications complying with Section 6.4).

3. All safety and environmental requirements

4. Overall schedule or proposed ROW schedule described in Sections 2, 5 and 7
5. Ensure that the placed, abandoned, excavated, or relocated utilities within the Project limits are all locatable. Locatable shall mean that the line can be field located using SUE QL-B methodology.

The DB Team shall be responsible for performing all utility removal, relocation, and adjustments required to accommodate the proposed Project in accordance with the MOU and any required Utility Agreements. This shall include any required inspection, permitting, testing, and monitoring to ensure that all the work is properly performed to the approved design plans. The resolution of any conflicts between Utilities and the construction of the Project shall be the responsibility of the DB Team. No additional compensation will be allowed for any delays, inconveniences, or damage sustained by the DB Team or its subcontractor(s) due to interference from utilities or the operation of relocating utilities.

6.4.3 Inspection of Utility Owner Construction

The DB Team shall set forth procedures for inspection of all Utility Adjustment Work performed by Utility Owners (and/or their contractors) to verify compliance with the applicable requirements described in Section 6.4.2 and to ensure the work is being accomplished in accordance with the GDOT approved Utility Relocation Plan.

6.4.4 Scheduling Utility Adjustment Work

The Utility Adjustment Work (other than construction) may begin at any time following issuance of NTP 1. Refer to Article 7.6.2 of the Agreement for the conditions to commencement of Utility Adjustment Construction Work by the DB Team. The DB Team shall not arrange for any Utility Owner to begin any demolition, removal, or other construction Work for any Utility Adjustment until all of the following conditions are satisfied:

1. The Utility Adjustment is covered by an executed Utility Agreement (if required) (and any conditions to commencement of such activities that are included in the Utility Agreement have been satisfied).

2. Availability and access to affected Replacement Utility Property Interests have been obtained by the Utility Owner (and provided to the DB Team, if applicable).

3. Proposed ROW and/or Additional Properties have been obtained in accordance with the applicable requirements of the DB Documents.

4. If applicable, the Alternate Procedure List has been approved by FHWA, and either (a) the affected Utility is on the approved Alternate Procedure List, as supplemented, or (b) the Utility Owner is on the approved Alternate Procedure List, as supplemented.

5. The review and comment process has been completed and required approvals have been obtained for the Utility Work Plan covering the Utility Adjustment.

6. All third-party approvals (such as railroad, governmental, etc.) necessary for the Utility Adjustment construction have been obtained, and any pre-construction requirements contained in those approvals have been satisfied.
7. All other conditions to that Work stated in the DB Documents have been satisfied.

6.4.5 **Standard of Care Regarding Utilities**

The DB Team shall carefully and skillfully carry out all Work impacting Utilities and shall mark, support, secure, exercise care, and otherwise act to avoid damage to Utilities in accordance with O.C.G.A. 25-9 (The Georgia Utility Facility Protection Act). At the completion of the Work, the condition of all Utilities shall be at least as safe and permanent as before.

6.4.6 **Emergency Procedures**

The WUCS shall prepare and submit to GDOT an Emergency Utility Response Plan in accordance with Section 6.1.3.4.5.

6.4.7 **Switch Over to New Facilities**

After a newly adjusted Utility has been accepted by the Utility Owner and is otherwise ready to be placed in service, the DB Team shall coordinate with the Utility Owner regarding the procedure and timing for placing the newly adjusted Utility into service and terminating service at the Utility being replaced.

6.4.8 **Traffic Control**

The DB Team shall be responsible for, and the Construction Traffic Control Plan shall cover, all traffic control made necessary for Utility Adjustment Work, whether performed by the DB Team or by the Utility Owner. Traffic control for Adjustments shall be coordinated with GDOT. Traffic control shall comply with the guidelines of the Manual of Traffic Control Devices (MUTCD), current edition, and of Section 18.

6.5 **Deliverables**

The DB Team shall time all Submittals described in this Section 6 to meet the Project Baseline Schedule, taking into account GDOT’s applicable review and response times designated in this Section 6, or if not stated therein, then as stated in Article 6.3 of the Design-Build Agreement (Volume 1).

The DB Team will provide to GDOT concurrently with accepted construction Utility Record Drawings (as-built plans), one full-sized, three half-sized, one PDF, and one MicroStation copy of the Utility Record Drawings (as-built plans) for review. GDOT will have 30 days to review and return as accepted or with comments. The DB Team will address any comments and return to GDOT for final review and acceptance. Upon GDOT review and acceptance, the DB Team will provide a copy of the accepted final Utility plans to all Utility Owners whose utility relocation work was performed by the DB Team.
6.5.1 **Utility Work Plan Submittals**

The DB Team shall transmit any GDOT comments to the Utility Owner, and shall coordinate any modification, review, and approval by the Utility Owner and re-submittal to GDOT, as necessary to resolve all GDOT comments and/or obtain GDOT's acceptance, as applicable.

6.5.2 **Preliminary Utility Status Report**

The DB Team shall prepare and submit to GDOT a Preliminary Utility Status Report concurrently with accepted relocated utility plans in accordance with Section 3.

6.5.3 **Subsurface Utility Engineering (SUE) Requirements**

The DB Team shall compile and submit to GDOT all SUE deliverables, Utility relocation plans, SUE Utility Impact Analysis, Utility Adjustment Schedules (if required), Utility Agreements (if required), Utility Estimates (if required) (if estimates are provided by the utility owners), and Letters of “no conflict,” as set forth above for the Project. The DB Team is expected to assemble the information included in the Utility Agreements and Utility relocation plans in a final and complete form and in such a manner that GDOT may accept the submittals with minimal review required.

Each Utility Agreement and Utility relocation plan submitted shall be accompanied by a certification from the DB Team stating that the proposed relocation will not conflict with the proposed highway improvement and will not conflict with another Utility Owner’s relocation plan.

6.5.4 **Utility As-Built Standard**

6.5.4.1 **General As-Built Utility Requirements**

The DB Team shall be responsible for managing, ensuring the accuracy of, and delivering all utility Record Drawings, which must be provided after utility relocations are completed and prior to Project closeout. The DB Team shall submit detailed as-built utility information, which will include all resulting abandoned or relocated utilities present within the Project limits. A “Record Drawing” will be submitted for each utility on the Project, whether the utility work is included in the contract price or the utility work is performed by the Utility Owner or the Utility’s contractor.

The DB Team shall ensure the following:

1. All underground utilities that were relocated within the Project limits will be surveyed at the time of installation to determine the exact location and position of the utility line, including:
   a) The outside diameter of pipe or width of duct banks and configuration of non-encased multi-conduit systems
   b) The utility’s structural material composition and condition
c) Identification of benchmarks used to determine elevations

d) Elevations with an accuracy of +/- 0.05 ft and certified accurate to the benchmark(s) used to determine elevations

e) Horizontal data accurate to within +/- 0.2 ft or applicable survey standards, whichever is more precise

f) Recording and labeling of the average depth below the surface of each run, all change of direction points, and all surface or underground components such as valves, manholes, drop inlets, clean outs, meters, etc.

i) For wet facilities – typically at 100’ intervals

ii) For dry facilities – typically at 25’-50’ intervals, depending on the vertical alignment

2. All resulting abandoned or excavated underground utilities within the Project limits shall be clearly delineated and labeled as “abandoned” or “removed.”

3. All relocated aerial facilities shall be recorded to include the following:

   a) Owner

   b) Age

   c) Size

   d) Height

   e) Number

   f) Material type

   g) General condition of the utility

   h) Horizontal location surveyed to the same accuracies and precision as is required for the topographic data

   i) Aerial Utility Owners attached to the pole

   j) Horizontal connectivity of the utilities between the poles, including major service drops (substations or industrial facilities).

6.5.4.2 As-Built Utility CADD Files and Plans Preparation

The DB Team shall submit as-built information in GDOT’s current CADD format (Microstation and InRoads) and in PDF format in accordance with GDOT’s current Electronic Data Guidelines (EDG) and Plan Presentation Guide (PPG).

The DB Team shall ensure the as-built utility information is submitted as follows:

CADD Files

   1. All points/data shall be placed in one (1) CADD file per Utility Owner.
2. DGN files shall be named using the naming convention “1234567UTLAB_XYZ.dgn” (where “1234567” represents the PI# and “XYZ” the Owner’s UPC code).

3. One (1) empty, overall file using the naming convention “1234567UTLEAB.dgn” shall be created with all individual files named “1234567UTLAB_XYZ.dgn” attached as reference files.

4. All UTLAB files shall follow the conventions set forth in the EDG for the UTLE file.

5. Sheet files, using GDOT’s title block, shall be created for each Utility Owner in accordance with Section 24, and Section 44 (if required) of GDOT’s PPG; levels shall be correctly turned on/off/grayed back to enable future printing if needed.

6. The Project’s scale shall be maintained.

7. Relocated poles shall be numbered and matched to a pole data table.

8. Pole data tables and point data tables shall be included.

9. All street names shall be labeled.

10. All easements and ROW shall be labeled.

11. The location and elevation of the referenced benchmark shall be identified and labeled; if the referenced benchmark is not within the Project limits, then a complete description of its location shall be provided to assist in future locating.

12. Any changes in details of design and/or additional supporting information, such as approved placement details, pipe sizes, material changes, geo-coded photos, etc., shall be labeled.

**PDF Files**

1. PDFs of the CADD sheet files shall be created for each Utility Owner in accordance with Section 24, and Section 44 (if required) of the GDOT PPG; levels shall be correctly turned on/off/grayed back to enable future printing.

2. Include the name, address, and telephone number of the firm preparing the drawing in the title block.

3. Include the date the as-built data is collected in the revision block of the title block.

4. Include the Professional Surveyor’s or Professional Engineer’s stamp and statement certifying that Record Drawings reflect the true conditions in the field.
   a. An electronic stamp may be used.
   b. Certification applies to new as-built information (not to the existing utility information) provided by GDOT.
5. Provide the Contractors’ statement (with an original signature and Project Number on the cover sheet and transmittal letter) verifying that all construction specifications and product qualities have been met.

6. Label “Record Drawing” on each sheet.

6.5.4.3 Utility Record Drawings Review and Submittal Process

1. The DB Team shall submit completed as-built CADD files and PDFs of the Record Drawings utility plan sheets to the DB Team’s EOR for review and comment(s).

2. Each respective Utility Owner, whose work was included in the contract, shall receive a PDF copy of their Record Drawings for review and acceptance at the interval(s) specified in the Project’s contract; all comments shall be provided to the DB Team.

3. The DB Team shall revise and make changes or adjustments to the as-built utility-related data, as necessary.

4. Record Drawings shall not be considered complete until the DB Team has responded to all comments from these reviews to the satisfaction of the DB Team’s EOR and the Utility Owners.

5. The DB Team shall submit final Record Drawings utility plans to GDOT as follows:
   a. One (1) overall, final CADD file in GDOT’s current CADD Software with each Utility Owner’s file appropriately attached as a reference file per GDOT’s PPG and EDG.
   b. One (1) PDF set of Section 24, and Section 44 (if required) plans for each Utility Owner’s facilities.

6. Quality Assurance (QA) shall be performed by GDOT on all deliverables to determine compliance with GDOT’s EDG ad PPG before final acceptance by GDOT.

6.5.4.4 Utility Facility Relocation Acceptance Form

The Utility Facility Relocation Acceptance Form (see Attachment 6-1) shall be completed by the Contractor’s Worksite Utility Coordination Supervisor (WUCS). It shall also be signed by an authorized representative of the Utility Owner and by the GDOT Project Manager upon completion and acceptance of the final utility as-built plans by the Utility Owner.

Execution of the Utility Facility Relocation Acceptance Form by the DB Team, Utility Owner and GDOT provides acknowledgement that the utility relocation work accomplished by the DB Team has been visually inspected and accepted by the Utility Owner as to having been constructed in accordance with the Utility Owner approved relocation design plans and their current specifications and the requirements of the Memorandum of Understanding (MOU) as executed by the Utility Owner. Further, the
Contractor's WUCS shall provide the Utility Owner with a complete set of Record Drawings (CADD and PDF) reflecting the relocation work performed by the Contractor for review and approval. Upon completion of the Utility Facility Relocation Acceptance Form and the exchange of the final Utility Owner approved Record Drawings, all parties shall agree that the Utility Owner will operate and maintain the installed facilities covered by Utility Facility Relocation Acceptance Form going forward based on the date of execution by the GDOT Project Manager (PM). However, any items inadvertently overlooked and as identified in a subsequent utility punch list shall still be the responsibility of the DB Team to correct and provide up to date Record Drawings to the Utility Owner.

Execution of the Utility Facility Relocation Acceptance Form by GDOT does not confer legitimacy and accuracy or in any way transfers liability for errors or omissions made by the preparer.
7 RIGHT OF WAY (ROW) – Additional Properties

Refer to Volume 2.
8 GEOTECHNICAL

8.1 General

The DB Team shall perform all geotechnical investigations, testing, research, and analysis necessary to effectively determine and understand the existing surface and subsurface geotechnical conditions. The DB Team shall ensure the geotechnical investigations and analyses are both thorough and complete, so as to provide accurate information for the design of roadways, pavements, foundations, structures, and other facilities that result in a Project that is safe and meets operational standards.

All geotechnical reports, provisions, and recommendations developed by the DB Team and accepted and/or concurred by GDOT will be part of the Project's design and shall be endorsed by the EOR.

8.1.1 Standards

The DB Team shall construct and maintain roadway pavements in conformance to GDOT's Pavement Design Manual and GDOT policies and procedures.

All other geotechnical Work shall be performed in general conformance with GDOT's Geotechnical Engineering Manual and guidelines, AASHTO guidelines, and Attachment 3-1 Manuals, and other provisions of the DB Documents.

8.2 Design Requirements

8.2.1 Subsurface Geotechnical Investigation by the DB Team

The DB Team shall determine the specific locations, frequency, and scope of all subsurface geotechnical investigations, testing, research, and any analysis the DB Team considers necessary to provide a safe and reliable roadway, pavement, foundation, structure, and other facilities for the Project.

The DB Team shall prepare and amend, as needed, Geotechnical Engineering Reports as described later in this Section 8 documenting the assumptions, conditions, and results of the geotechnical investigation and analysis, including the following:

1. The geology of the Project area, including soil and/or rock types, and drainage characteristics.

2. Field investigations and laboratory test results used to characterize engineering and physical properties of soil and rock, including moisture content, plasticity index, gradations for each major soil strata change, levels of shrink/swell potential soil compressibility, and short-term and long-term settlement/consolidation, strength tests and engineering properties; recording rock recovery and rock quality designation in the field in addition to laboratory tests to determine compressive and split tensile strength tests of rock cores.
3. A discussion of conditions and results with reference to specific locations on the Project including dewatering plan and its impact on near-by structures.

4. Design and construction parameters resulting from the geotechnical investigation and analysis, including parameters for the design of pavements, pipes, foundations, structures, slopes, and embankments.

5. Plan view locations of field sampling, profile of boring logs and other field data, laboratory test results, calculations, and analyses that support design decisions taking into consideration down-drag on piles and soil squeeze in high embankments.

6. Include the slope stability analysis for embankment and excavation slopes including both short-term (undrained) and long-term (drained) conditions, and discussion of design measures undertaken to ensure stability and safety of all slopes. The analysis shall consider the potential for long-term surficial slide failures common to high plasticity clays in Georgia, and specific recommendations shall be provided to minimize their occurrence. Internal and external stability analysis shall be considered for walls supporting fill/cut within the Project.

Each Geotechnical Engineering Report along with back-up of calculations and input and output of GDOT recognized computer software, upon completion, shall be submitted to GDOT for review and comment as a Submittal.

If environmentally-sensitive conditions such as undocumented contaminated soil or archaeological sites are encountered during the subsurface exploration activities, the DB Team shall notify GDOT immediately. For hazardous materials, the DB Team shall also follow the requirements in Article 7.8 of the DBA and in GDOT Standard Specification 107.22.

8.2.2 Bridge Foundation Investigation (BFI)

The DB Team shall perform a BFI for the Project. The BFI report and all recommendations shall be reviewed and endorsed by the EOR.

Pile Foundation

1. The DB Team shall design and construct the pilings in accordance with all related special provisions per the approved Bridge Foundation Investigation recommendations.

2. All piles shall be embedded a minimum of 10 feet into natural ground and 10 feet below 500 year scour line with additional length determined by the lead Professional Engineer for geotechnical design.
3. Piles shall have minimum embedment in the following materials:

**Table 8-1: Pile Embedment Specifications**

<table>
<thead>
<tr>
<th>Material and Density</th>
<th>Minimum Embedment</th>
</tr>
</thead>
<tbody>
<tr>
<td>15- to 20-blow count soil</td>
<td>15 feet</td>
</tr>
<tr>
<td>40- to 50-plus blow count soil</td>
<td>10 feet</td>
</tr>
<tr>
<td>Hard rock (requires pilot holes)</td>
<td>5 feet</td>
</tr>
</tbody>
</table>

4. Pile tips should be set below any soft/loose soils that may settle/consolidate under the design load unless the soft/loose soils are at least deeper than five (5) pile diameters below the pile tip.

5. When piles must penetrate into rock to provide the minimum embedment, use pilot holes drilled a minimum of 5 feet into the rock.

**Drilled Caisson**

1. The DB Team shall design and construct the drilled caissons in accordance with Special Provision 524 per the approved Bridge Foundation Investigation recommendations.

2. When sound rock is encountered, drilled caissons shall be embedded a minimum of 10 feet into sound rock as defined by Special Provision 524.3.05 or per the approved Bridge Foundation Investigation (BFI) recommendations.

**Spread Footings**

1. Top of footing shall be a minimum of 2 feet below the top of final grade.

2. Spread Footings should bear below the scour line, if applicable.

**8.2.3 Dynamic Pile Testing**

The DB Team shall perform dynamic pile testing using the Pile Driving Analyzer (PDA) to monitor the driving of piles with accelerometer and strain gauges attached to the piles. The DB Team shall perform a minimum of two (2) PDAs (one for the abutment and one for the intermediate bents), but no less than two percent (2%) of the production piles, and additional PDAs will be required for a change in bent type, change in abutment, change in geotechnical material, or as determined by the EOR. The DB Team shall perform the dynamic pile testing in accordance with ASTM D4945-08 and Special Provision 523 per the approved Bridge Foundation Investigation recommendations.

Upon completion of a PDA test, the DB Team shall provide a complete report consisting of but not limited to PDA field monitoring data, results of CAPWAP computer analyses, and the driving criteria recommendation from the geotechnical engineer who developed the BFI. The recommendation shall be endorsed by the EOR. The DB Team shall submit...
the report electronically in PDF format and the electronic data files of the PDA analysis and CAPWAP to GDOT and allow seven (7) calendar days for review and acceptance before proceeding with driving production piles.

8.2.4 Soil Survey (SS)
The DB Team shall perform Soil Survey for all Projects that include the design of roadway foundations, embankments, and the treatments for geotechnical and related problems on the Project in conformance with the GDOT Geotechnical Engineering Manual and Attachment 3-1 Manuals. The SS report and all recommendations shall be reviewed and endorsed by the EOR.

8.2.5 Pavement Design
The DB Team shall comply with the required minimum pavement design provided in Volume 2, Section 11.

If pavement design has not been previously approved by GDOT, then the DB Team shall prepare a pavement design report that confirms or revises the required minimum pavement design provided in Volume 2, Section 11. The pavement design report shall document the assumptions, considerations, and decisions contributing to the Project’s pavement design and meet all requirements of GDOT’s Pavement Design Manual.

For roadways adjacent to and crossing the Project that are disturbed by the construction activities of the Project:

1. The DB Team shall, at a minimum, match the in-place surface type and structure of the existing roadways.
2. All new shoulders shall be constructed as full depth shoulders unless otherwise specified in Volume 2.
3. The DB Team shall design all tie-in Work to avoid differential settlement between the existing and new surfaces.
4. The DB Team shall coordinate the design and construction of all cross roads with the Governmental Entity having jurisdiction whether a municipality, county, or GDOT.

8.2.6 Wall Foundation Investigation (WFI)
The DB Team shall perform a WFI for the Project that includes wall structures in conformance with the GDOT Geotechnical Engineering Manual, AASHTO guidelines, and Attachment 3-1 Manuals for all new walls and wall extensions. The WFI report and all recommendations shall be endorsed by the EOR.

8.2.7 High Mast Lighting Foundation
Refer to Volume 2.
8.3 Construction

Materials used to construct the Project shall meet the minimum requirement as specified in GDOT specifications, policies and procedures, guidelines, and Attachment 3-1 Manuals. All materials used to construct the Project shall conform to the requirements of the GDOT Qualified Products List (QPL) or equivalent as approved by GDOT. Testing of materials shall be performed by personnel possessing the requisite GDOT materials certifications.

The DB Team shall be responsible for obtaining and complying with all Governmental Approvals for construction of the Project.

The DB Team shall submit to GDOT for review and acceptance any blasting plan(s). Blasting shall be performed in accordance with State Law, and in accordance with GDOT’s specifications, policies and procedures.

8.4 Reserved
9 SURVEYING AND MAPPING

9.1 General
The DB Team shall provide accurate and consistent land surveying and mapping necessary to support ROW acquisition, design, and construction of the Project. The DB Team is responsible for all surveying responsibilities.

The DB Team shall review existing survey data and determine the requirements for updating or extending the existing survey and mapping data. The DB Team is responsible for the final precision, accuracy, and comprehensiveness of all survey and mapping.

9.1.1 Standards
The DB Team shall provide surveying and mapping activities in accordance with the GDOT Automated Survey Manual and Attachment 3-1 Manuals, and other provisions of the DB Documents.

9.2 Administrative Requirements

9.2.1 Ownership
The documents produced by the DB Team surveyor or the surveyor’s subcontractors are the property of GDOT and release of any such document shall be approved by GDOT.

9.2.2 Property Owner Notification
The DB Team shall prepare for GDOT review and acceptance a property owner notification letter in accordance with the GDOT Automated Survey Manual prior to entering any private property outside the Existing ROW.

9.3 Design Requirements

9.3.1 Units
All survey Work shall be performed in U.S survey feet. Work shall conform to state plane coordinates.

The combined sea level and scale factor for the Project shall conform to the GDOT Automated Survey Manual.

9.3.2 Survey Control Requirements
The DB Team shall ensure that all surveying conforms the Georgia Professional Land Surveying Practices Act, follows the General Rules of Procedures and Practices of the Georgia Board of Professional Engineers and Land Surveying, and otherwise conforms to all applicable Law. The DB Team shall ensure that any person in charge of the survey
is proficient in the technical aspects of surveying, and is a Professional Land Surveyor (Surveyor).

The DB Team shall establish all horizontal and vertical primary Project control from approved control provided by GDOT. If the DB Team chooses to use GPS methods, the DB Team shall meet the guidelines as defined in the GDOT Automated Survey Manual.

The DB Team shall establish and maintain additional survey control as needed and final ROW monumentation throughout the duration of the Project.

The DB Team shall tie any additional horizontal and vertical control for the Project to the established primary Project control network.

All survey control points shall be set and/or verified by a Professional Land Surveyor.

The DB Team shall establish and maintain a permanent horizontal and vertical primary survey control network. The control network shall consist of, at minimum, horizontal deltas coordinated and elevated set in intervisible pairs at spacing of no greater than one (1) mile. Control monuments shall be installed per the GDOT Automated Survey Manual. Prior to construction, the DB Team in coordination with GDOT shall provide NOAA no less than a 90-day notification of planned activities that will disturb or destroy any geodetic control monuments. This will provide time to plan for and execute relocation of geodetic monuments. The DB Team shall replace all existing horizontal and vertical primary survey control points disturbed or destroyed. The DB Team shall make all survey computations and observations necessary to establish the exact position and elevation of all other control points based on the primary survey control.

The DB Team shall deliver to GDOT a survey control package in accordance with the criteria in the GDOT Automated Survey Manual. In addition, the DB Team shall deliver to GDOT a revised survey control package when survey monuments or control points are disturbed, destroyed or found to be in error.

9.3.3 Conventional Method (Horizontal & Vertical)

If the DB Team chooses to use conventional methods to establish additional horizontal control, the DB Team shall meet the accuracy of the appropriate level of survey as defined in the GDOT Automated Survey Manual.

9.3.3.1 Horizontal Accuracy Requirements for Conventional Surveys

Horizontal control is to be established on the Georgia State Plane Coordinate System of 1985 [NAD83 or GCS 85], at a minimum.

Upon request by the DB Team, GDOT will compile and provide to the DB Team a survey control package of existing GDOT approved survey monumented data in the Project vicinity.
### 9.3.3.2 Vertical Accuracy Requirements for Conventional Surveys

Vertical control shall be established on the North American Vertical Datum of 1988 (NAVD 1988) as shown in Table 9-1.

**Table 9-1: North American Vertical Datum of 1988**

<table>
<thead>
<tr>
<th></th>
<th>1st Order</th>
<th>2nd Order</th>
<th>3rd Order</th>
<th>Remarks and Formulae</th>
</tr>
</thead>
<tbody>
<tr>
<td>Error of Closure</td>
<td>0.013 feet √M</td>
<td>0.026 feet √M</td>
<td>0.049 feet √M</td>
<td>Loop or between control monuments</td>
</tr>
<tr>
<td>Maximum Length of Sight</td>
<td>250 feet</td>
<td>300 feet</td>
<td></td>
<td>With good atmospheric conditions</td>
</tr>
<tr>
<td>Difference in Foresight and Backsight Distances</td>
<td>±10 feet</td>
<td>±20 feet</td>
<td>±30 feet</td>
<td>Per instrument set up</td>
</tr>
<tr>
<td>Total Difference in Foresight and Backsight Distances</td>
<td>±20 feet per second</td>
<td>±50 feet per second</td>
<td>±70 feet per second</td>
<td>Per total section or loop</td>
</tr>
<tr>
<td>Recommended Length of Section or Loop</td>
<td>2.0 miles</td>
<td>3.0 miles</td>
<td>4.0 miles</td>
<td>Maximum distance before closing or in loop</td>
</tr>
<tr>
<td>Maximum Recommended Distance Between Benchmarks</td>
<td>2000 feet</td>
<td>2500 feet</td>
<td>3000 feet</td>
<td>Permanent or temporary benchmarks set or observed along the route</td>
</tr>
<tr>
<td>Level Rod Reading</td>
<td>± 0.001 foot</td>
<td>± 0.001 foot</td>
<td>± 0.001 foot</td>
<td></td>
</tr>
<tr>
<td>Recommended Instruments and Leveling Rods</td>
<td>Automatic or tilting w/ parallel plate micrometer precise rods</td>
<td>Automatic or tilting w/ optical micrometer precise rods</td>
<td>Automatic or quality spirit standard, quality rod</td>
<td>When two or more level rods are used, they should be identically matched</td>
</tr>
<tr>
<td>Principal Uses</td>
<td>Broad area control, subsidence or motion studies; jig and tool settings</td>
<td>Broad area control, engineering projects basis for subsequent level work</td>
<td>Small area control, drainage studies, some construction and engineering</td>
<td></td>
</tr>
</tbody>
</table>
9.3.4 Reserved

9.3.5 Right of Way Surveys

The DB Team shall base all surveys on the primary horizontal and vertical control network established for the Project.

9.3.5.1 Accuracy Standard

In performing ROW surveys consisting of boundary locations, the DB Team shall meet the accuracy standards of the appropriate level of survey as defined in the following table.

Table 9-2: Chart of Tolerances

<table>
<thead>
<tr>
<th></th>
<th>Rural</th>
<th>Urban</th>
<th>Remarks and Formulae</th>
</tr>
</thead>
<tbody>
<tr>
<td>Error of Closure</td>
<td>1:20,000</td>
<td>1:25,000</td>
<td>Loop or between Control Monuments</td>
</tr>
<tr>
<td>Adjusted Mathematical</td>
<td>1:50,000</td>
<td>1:50,000</td>
<td></td>
</tr>
<tr>
<td>Closure of Survey (No Less Than)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*GDOT policy requires all bearings or angles be based on the following source: Grid bearing of the Georgia Coordinate System of 1985, with the proper zone and epoch specified.

9.3.6 Survey Records and Reports

The DB Team may use electronic field books to collect and store raw data. The DB Team shall preserve original raw data and document any changes or corrections made to field data, such as station name, height of instrument, or target. The DB Team shall also preserve raw and corrected field data in hardcopy output forms in a similar manner to conventional field books for preservation.

Field survey data and sketches that cannot be efficiently recorded in the electronic field volume shall be recorded in a field note volume and stored with copies of the electronic data.

All field notes shall be recorded in permanently bound books. (Loose leaf field notes will not be allowed.) The DB Team shall deliver copies of any or all field note volumes to GDOT upon request.

The documents produced by the Surveyor, or the Surveyor’s subcontractors, are the property of GDOT, and release of any such document shall be approved by GDOT prior to release.
All topographic mapping created by the DB Team shall be provided to GDOT in digital terrain model format using the software and version thereof being used by GDOT at the time of delivery.

### 9.4 Construction Requirements

**9.4.1 Units**
Comply with the requirements in Section 9.3.

**9.4.2 Construction Surveys**
Comply with the requirements in Section 9.3.

**9.4.3 ROW Monuments**
Comply with the requirements in Section 9.3.

Upon completion of the ROW acquisition and all Construction Work, such that the Final ROW monuments will not be disturbed by construction, the DB Team shall set permanent and stable concrete ROW monuments (constructed according to current GDOT specifications) located on the final ROW line at all points of curvature (PCs), points of tangency (PTs), points of intersection (PIs), miters and breaks, points of compound curvature (PCCs), points of reverse curvature (PRCs), and all intersecting crossroad ROW lines. In addition, the DB Team shall set permanent and stable concrete ROW monuments (constructed according to current GDOT specifications) located on all final ROW lines where the distance between such significant ROW line points exceeds fifteen hundred (1,500) feet at no more than 1,000-foot intervals.

The DB Team shall purchase all materials, supplies, and other items necessary for proper survey monumentation.

### 9.5 Reserved
10 GRADING

10.1 General

The DB Team shall conduct all Work necessary to meet the requirements of grading, including clearing and grubbing; excavation and embankment; removal of existing buildings, pavement, and miscellaneous structures; subgrade preparation and stabilization; dust control; aggregate surfacing; and earth shouldering.

All borrow, stockpile, and waste sites for this Project shall be environmentally approved prior to construction activities occurring in them. All common fill or excess material disposed of outside Project Right of Way shall be placed in either a permitted solid waste facility, a permitted inert waste landfill, or in an engineered fill. See Standard Specifications Construction of Transportation Systems, Special Provisions, Shelf Special Provisions, Reference Special Provisions, and Supplemental Specifications thereto for additional information.

Existing bridge and/or construction debris shall not be disposed of within the Project. The DB Team shall provide an environmentally approved site to dispose the existing bridge and/or construction debris at no additional cost to GDOT.

Should the DB Team discover any non-permitted encroachment in the existing right of way, the DB Team shall notify GDOT. The DB Team shall not take any action to remove the encroachment without GDOT approval.

Any features that are abandoned in place, e.g. parking lots, abandoned pavements, sidewalks, driveways, catch basins, drop inlets, pipes, manholes, curbing, retaining walls, utilities, foundations, paved floors, underground tanks, fences, bridges, buildings, and other incidental structures shall be removed to the following depths:

1. Abandoned pavements: Ensure existing pavement inside the Project no longer being used is obliterated, graded to drain, and grassed.

2. Abandoned pipes: Ensure abandoned pipes that are left in place are grout filled or filled with flowable fill.

3. Under pavements: Remove to a depth of at least three (3) feet below the finished subgrade elevation.

4. Underneath other structures: Remove to at least three (3) feet below the foundations of any proposed structure, including installations such as guard rail posts and utility poles.

5. Elsewhere within the ROW and easement areas, remove as follows: Remove to at least three (3) feet below the finished surface of slopes and shoulders and one (1) foot below natural ground outside construction lines.
6. Thoroughly crack or break abandoned structures that may impound water. These structures include but are not limited to concrete floors, basements, catch basins, and other structures within ten (10) feet of finished grade.

7. Break floors so that no section greater than ten (10) square feet remains intact.

10.1.1 Standards

The DB Team shall provide grading activities in accordance with Attachment 3-1 Manuals and other provisions of the DB Documents.

10.2 Demolition and Abandonment Plan

The DB Team shall develop, implement, and maintain, for the Term, a Demolition and Abandonment Plan for all existing structures, features, and utilities as described in Section 10.1 above (types and sizes) that will be removed, abandoned or partially abandoned during the Term. The Plan shall ensure that said structures are structurally sound after the abandonment procedure. The Plan shall show the locations of all existing features as listed in Section 10.1 that will be abandoned and shall show sufficient detail for the Abandonment.

GDOT reserves the right to require the DB Team, at any time to salvage equipment and/or material in an undamaged condition and to deliver to a location designated by GDOT within the GDOT District in which the Project is located. GDOT shall have first right of refusal to retain any salvage material or equipment. If GDOT decides not to salvage the material or equipment, the DB Team shall take possession but not reuse for the Project. All material incorporated into the Project shall be new.

The material from structures designated for demolition shall be the DB Team’s property. All material removed shall be properly disposed of by the DB Team outside the limits of the Project.

10.3 Slopes and Topsoil

The DB Team shall comply with Attachment 3-1 Manuals regarding design limitations and roadside safety guidelines associated with the design of slopes along roadways. The DB Team shall adjust grading to avoid and minimize disturbance to the identified waters of the U.S. The DB Team’s grading plan shall be in accordance with the approved Environmental Documents. The DB Team shall secure all associated Governmental Approvals to meet the Released for Construction (RFC) plans.

The DB Team shall perform finished grading and place topsoil in all areas suitable for vegetative slope stabilization (and areas outside the limits of grading that are disturbed in the course of the Work) that are not paved.

The DB Team shall clear the entirety of cut slopes within the available Right of Way. Debris shall be removed by the DB Team.
10.4 Special Flood Hazard Areas Fill Mitigation

Refer to Volume 2.
11 ROADWAYS

11.1 General

The DB Team shall coordinate its roadway design, construction, maintenance, and operation with all other Work planned or under construction by GDOT and/or Governmental Entity.

Whenever the DB Team receives a design request from an adjacent property owner, the DB Team shall, within thirty (30) days of the request, produce a report to GDOT identifying the nature of the request, the financial consequences to GDOT of compliance (if any), the DB Team’s assessment of the feasibility of compliance, any Change Requests from the Technical Provisions that would be required and any potential risks to GDOT that may arise from implementation of the design request such as environmental and permitting risks. Where the DB Team determines that there are no financial consequences to GDOT, time impacts to the Project, and Change Request from the Technical Provisions, and provided that GDOT raises no objection within thirty (30) days of the DB Team’s report, the DB Team may proceed with the implementation of the design request at its option and shall advise GDOT in writing of its decision.

No open cutting (removal of pavement to construct, repair, or relocate utilities/drainage structures or for any purposes that cause a full depth cut of existing pavement and removal of any subgrade beneath) of the Travel Lane pavements or ramp pavements shall be allowed without prior approval of GDOT. Any pavement that is open cut as described in this paragraph shall be repaired in kind prior to the Travel Lane or ramp being opened to traffic.

The stockpiling of materials may be permitted on a case by case basis provided that participation is based on the appropriate value of approved specification materials delivered by the DB Team to the Project Site, or other designated location in the vicinity of the Project and the terms and conditions below. Stockpiled materials that may qualify for material allowances include materials that are not readily available, can be easily identified and secured for this Project, and, can be stockpiled for long periods without detriment. The procedure identified in GDOT Supplement Specifications 109.07.B shall be used to process a Material Allowance Request. Other provisions include:

1. Stockpiles shall be constructed in conformity with the provisions in the current GDOT Standard Specifications, Construction of Transportation Systems. Appropriate erosion control measures shall be placed and maintained, and the site shall be restored to its original condition.

2. The stockpiled material is stored in such a manner that security and inventory can be maintained. The DB Team shall be responsible for storage of said materials at no additional cost to GDOT.
3. The material is supported by a paid invoice or receipt for delivery, with the DB Team to furnish the paid invoice within a reasonable time after receiving payment.

4. The material conforms with the requirements of the plans and specifications.

5. Any damage to material due to the delay in incorporation of the material into the Final Plans, shall be at the risk of the DB Team.

6. The quantity of material does not exceed the quantity required by the Project, nor does the value exceed the appropriate portion of the contract item in which the material is to be incorporated.

7. If the stockpiled material is embankment or other erodible material, then proper erosion control measures shall be adhered to.

11.1.1 Standards

The DB Team shall provide activities in this section in accordance with GDOT Standard Specifications, Construction of Transportation Systems, other Attachment 3-1 Manuals, and other provisions of the DB Documents.

11.2 Design Requirements

The DB Team shall coordinate its roadway design with the design of all other components of the Project. The Project roadways shall be designed to integrate with streets and roadways that are adjacent or connecting to the Project.

The Project roadways shall be designed to incorporate roadway appurtenances, including fences, noise attenuators, barriers, and hazard protection as necessary to promote safety and to mitigate visual and noise impacts on neighboring properties. Fence type shall be replaced in accordance with GDOT’s Construction Standards and Details. Should the existing type of fence not match the type provided in GDOT’s Construction Standards and Details, the type of proposed fence shall be submitted to GDOT for approval prior to construction.

The DB Team shall design and construct any and all proposed intersection reconstruction or rehabilitation to meet the requirements of the Environmental Document Approvals and Attachment 3-1 Manuals.

11.2.1 Design Criteria Order of Precedence

The following requirements shall be adhered to for the design of the Project. The plans provided in the Reference Information Documents are provided for reference only and may contain or conform to some but not all of the design requirements herein. In the event of any conflict, ambiguity or inconsistency among the following design criteria, the order of precedence, from highest to lowest, one being higher than two, shall be as follows:

1. Allowable Design Exception(s)/Variance(s) as set forth in Section 11.2.7

2. Volume 2 and Volume 2 Attachments (Technical Provisions)

11.2.2 Vibration Control

The DB Team is responsible for any and all vibration related damages to existing structures or other facilities located in the vicinity of construction related activities. Where vibration-inducing construction activities are to be performed in the vicinity of existing properties, structures, utilities, or other facilities, the DB Team shall evaluate potential impacts and develop a Vibration Control Plan for GDOT review and acceptance. The plan shall include certain triggers of action to ensure no damage to existing structures occurs as well as a means to resolve public concerns for the vibration at any level. Additional requirements for the Vibration Control Plan are as follows:

1. Use attenuation relationships published by applicable governmental agencies and/or applicable equipment manufacturers to estimate the zones within which vibrations caused by the Project may impact existing properties and facilities.

2. Within the zone of potential vibration impacts, conduct site reconnaissance of properties during site investigations to determine the sensitivity of each structure/facility to vibrations.

3. List all properties that may be adversely affected by vibrations.

4. Conduct a preconstruction survey of each structure determined to be susceptible to vibrations.

5. Provide GDOT with recommendations to mitigate that may be adversely affected by vibrations.

6. Use the vibration monitoring records to develop attenuation curves for predicting vibrations at varying distances from the source.

The DB Team shall adjust operations immediately if the threshold readings above are exceeded.

11.2.3 Blasting


11.2.4 Control of Access

The DB Team shall maintain all existing property accesses, including those not shown on the schematic, and shall not revise control of access without GDOT review and the written agreement of the affected property owner. Access control shall be in conformance with the GDOT Regulations for Driveway and Encroachment Control.

11.2.5 Typical Section(s) and Pavement Design

Refer to Volume 2.
11.2.6 Additional Roadway Design Requirements

The DB Team shall coordinate, design and construct the improvements on crossing streets in accordance with the requirements of the Governmental Entity having jurisdiction of said roadway.

All roadside safety devices used on the Project shall meet current crash test and other safety requirements that meet or exceed current GDOT requirements.

Longitudinal pavement joints in the wheel path of the traveling public shall not be designed or constructed unless specifically approved by GDOT in writing.

When designing and constructing hardscape elements at intersections, at a minimum, the DB Team shall use colored textured concrete in all raised medians. Monolithic concrete medians shall not be permitted. Stamped concrete may only be used where the DB Teams acquires written agreement, in a manner acceptable to GDOT, from local communities to maintain it, and where it meets the requirements in GDOT specifications, policies, procedures and Attachment 3-1 Manuals.

Concrete paving shall be used in hard to reach mowing areas or under structures (such as, but not limited to, areas near or next to or between guard fence posts, sign posts, bent columns, next to retaining walls, freeway ramp gores, paved ditches, flumes, ditch inlets, etc.) to improve roadway appearance.

When construction impacts existing cable barrier that will remain in place, new end terminals shall be installed as required to ensure cable barrier remains in operation at all times. If existing cable barrier cannot remain in operation during construction, temporary concrete barrier shall be installed in the same general location as the existing cable barrier for the full length impacted, including approaches.

11.2.7 Allowable Design Exception(s)/Variance(s)

Refer to Volume 2.

11.2.8 Visual Quality

Refer to Volume 2.

11.2.9 Permanent Lighting

All third-party requests for lighting within the Project Site shall be subject to GDOT approval.

The DB Team shall design the lighting of the Project in accordance with Attachment 3-1 Manuals and published guidelines, manuals, policies, etc. by reference in the manuals listed in Attachment 3-1, the DB Documents, and at a minimum shall match the existing lighting. The DB Team shall also make all necessary enhancements or changes to the existing lighting system to maintain the existing illumination if diminished by the Project.
The DB Team shall design and construct the lighting system in a manner that will reduce and/or discourage vandalism.

The DB Team shall install mechanical copper wire theft deterrent devices in all Project electrical conduits supplying power to the Project. The theft deterrent devices typically consist of a rubber stopper mechanical device that compress against the electrical wiring and prevents the wires from being easily pulled through the conduits. The DB Team shall also install electrical pull box lids that contain locking mechanisms that works with the use of cams to prevent unauthorized access.

The DB Team shall prepare photometric studies to show luminance, illuminance and veiling luminance and uniformity as appropriate for the roadways, interchanges, and special areas including roadway intersections. Provide vertical illuminance calculations as appropriate in sidewalk or multi-use areas as appropriate, as well as within crosswalk areas.


The DB Team shall design the lighting system to minimize or eliminate illumination of areas outside the Existing ROW. Luminaire poles shall meet GDOT specifications. All luminaires shall be LED, unless the DB Team is removing and replacing an existing lighting system. Neither mercury vapor nor metal halide is allowed. All alternative energy efficient lighting technology can be considered, pending GDOT acceptance.

The DB Team shall design and construct the lighting system in a manner that will reduce and/or discourage vandalism.

Luminaire poles and breakaway bases shall be designed in accordance with AASHTO’s Standard Specifications for Structural Supports for Highway Signs, Luminaire, and Traffic Signals. The DB Team shall install breakaway wiring connectors when using breakaway bases. For all poles located within the clear zone of the roadways, the DB Team’s design shall incorporate breakaway devices that are pre-qualified by GDOT. Appropriate safety measures shall be used if the DB Team does not use luminaire poles and breakaway bases. Breakaway bases shall not be used when mounted on side barriers, median barriers or bridge structures.

The DB Team shall place all understructure lighting in a configuration that minimizes the need for lane closures during maintenance. No part of any light structure, mounting hardware or conduit under structures shall protrude below the bridge beams or other structure under any circumstance.
The DB Team shall determine and design appropriate foundation types and lengths for permanent lighting structures. GDOT requires consistent footing designs and has minimum footing size criteria for caisson type footings as follows:

**Table 11-1: Minimum Footing Size Criteria**

<table>
<thead>
<tr>
<th>Height of Pole</th>
<th>Diameter by Depth of Footing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than or equal to 40'</td>
<td>2’ by 6’</td>
</tr>
<tr>
<td>40’ to 50’</td>
<td>3’ by 7’</td>
</tr>
<tr>
<td>50’ to 60’</td>
<td>3’ by 9’</td>
</tr>
<tr>
<td>High Mast</td>
<td>See Section 8.2.7</td>
</tr>
</tbody>
</table>

NOTE: Poles for barrier mounted have a minimum of 2-ft by 4-ft base

The DB Team shall not place ITS cable, fiber-optic lines, signal conductors, or any other non-lighting related cables or conductors in the lighting conduit, ground boxes, or junction boxes.

Top latch mechanisms shall be used on all high mast lighting towers.

The DB Team shall minimize the potential hazards of lighting poles through the careful consideration of mounting options and pole placements, including the following options:

1. Placing mast arms on traffic signal poles
2. Placing pole bases on existing or proposed concrete traffic barrier
3. Placing poles behind existing or proposed concrete traffic barrier, guardrail or cable barrier
4. Placing high mast lighting outside the clear zone, especially in roadway horizontal curves

The DB Team shall ensure that lighting structures comply with Federal Aviation Administration (FAA) height restrictions within five (5) miles of airport facilities. In the event that proposed or existing luminaries, mast arms, or poles infringe into an airport’s or heliport’s base surface, the DB Team shall coordinate with the FAA and GDOT to permit or relocate such structures. If FAA restrictions prohibit lighting structures from being placed in certain areas near an airport Project, the DB Team shall find alternative ways of providing the required level of lighting at no additional cost to GDOT.

The DB Team shall coordinate with the Utility Owner(s) and ensure power service is initiated and maintained for permanent lighting systems. Where the Work impacts existing lighting, the DB Team shall maintain the existing lighting as temporary lighting during construction and restore or replace prior to Substantial Completion.

The DB Team shall place all bore pits safely away from traffic, provide positive barrier protection, and provide necessary signs to warn of the construction area.
The DB Team shall contact Utility Owners regarding their specific required working clearance requirements as depicted in Section 6.

The DB Team shall ensure that roadway lighting is provided for the safety of vehicles and pedestrians as they approach local intersections.

The DB Team shall affix an identification decal on each luminaire, ground box, and electrical service for inventory purposes and shall submit inventory information to GDOT in a GDOT-compatible format. This identification shall denote that these are property of GDOT and shall provide a contact phone number and address in the event of emergency.

11.2.10 Related Transportation Facilities

The DB Team shall design and construct all new roadway and bridges to accommodate the planned expansions or updates of Related Transportation Facilities as found in Volume 2.

11.3 Construction

Refer to Volume 2.
12 DRAINAGE

12.1 General

Effective performance of the drainage design and construction implemented for the Project ("the Drainage System") is an integral part of the success of the Project. All stormwater runoff that flows through the Project, whether originating within or outside the Project, must be accounted for in the design of the Drainage System. All existing and proposed riverine/tidal bridges, stormwater conveyances (open-channel and closed-conduit), inlets, and stormwater management such as detention/retention ponds are included as part of the Drainage System.

The Drainage System shall meet the following requirements:

1. The analysis, design, and construction of all components of the Drainage System shall address the interim conditions during construction of the Project and the conditions depicted in the RFC Plans.

2. The Drainage System shall have adequate capacity to convey all stormwater through the Project without any adverse impacts to upstream and/or downstream adjacent properties.

12.1.1 Standards

The DB Team shall provide activities in this section in accordance with GDOT's Manual on Drainage Design for Highways (Drainage Manual), Attachment 3-1 Manuals, and other provisions of the DB Documents.

12.2 Administrative Requirements

12.2.1 Data Collection

The DB Team shall collect all necessary data, including those components outlined in this Section 12.2.1, to establish a Drainage System that complies with the requirements and accommodates the historical hydrologic flows within the Project limits.

The DB Team shall collect all available data identifying stormwater runoff obligations, including:

1. Water quality regulations as imposed by local, State and federal governments
2. National Wetland Inventory and any other wetland/protected waters inventories
3. Any local floodplain ordinances in effective Federal Emergency Management Agency (FEMA) floodplains
4. Any restrictions on discharging storm water to environmentally sensitive areas, navigable waters or coastal zones
5. Official documents concerning the Project, such as the Environmental Documents and any other drainage or environmental studies

The DB Team shall determine any stormwater runoff issues that may include areas with historically inadequate drainage (evidence of flooding or citizen complaints of flooding), maintenance problems associated with drainage, and areas known to contain Hazardous Materials. The DB Team shall identify watershed boundaries, protected waters, areas classified as wetlands, floodplains, and boundaries between regulatory agencies (e.g., watershed districts and watershed management organizations).

The DB Team shall acquire all applicable municipal drainage plans, watershed management plans, coastal zone management plans, and records of citizen concerns. The DB Team shall acquire all pertinent existing storm drain plans, bridge hydraulic studies and/or survey data, including data for all culverts, drainage systems, storm sewer systems, and bridges within the Project limits. The DB Team shall also identify existing drainage areas and calculate the estimated runoff to the Drainage System.

The DB Team shall obtain photogrammetric and/or geographic information system (GIS) data for the Project that depict any impaired waters as listed by EPD. The DB Team shall conduct surveys for information not available from other sources.

If documentation is not available for certain components of the existing drainage system within the Project limits and these components are scheduled to remain in place, the DB Team shall investigate and video record or photograph these components to determine condition, size, material, location, and other pertinent information.

The data collected shall be taken into account in the Final Plans of the drainage facilities.

12.2.2 Coordination with Other Agencies

The DB Team shall coordinate all stormwater runoff issues with affected interested parties and regulatory agencies, including EPD, USACE, and USFWS.

12.3 Design Requirements

Within the Construction Maintenance Limits, the DB Team shall upgrade all substandard drainage facilities where the design and construction of the Project propose to utilize or impact those facilities. A drainage facility utilized on the Project is any drainage facility receiving Project stormwater runoff and/or any drainage facility conveying stormwater through the Project. A substandard drainage facility is any stormwater drainage system component where the existing structural condition per Section 13 and/or hydraulic capacity per this Section 12 is inadequate to carry additional stormwater generated by the Project. The design of the Drainage System shall include reconfiguration of the existing drainage systems within the Project limits and design of new storm drainage systems as required per the performance requirements, defined in this Section 12.
Damage to existing infrastructure due to the DB Team’s operation shall be immediately repaired to maintain existing system capacity at all times. This permanent repair shall be at the DB Team’s expense.

The DB Team shall provide facilities compatible with the existing drainage system and all applicable municipal drainage plans or systems in adjacent properties. The DB Team shall preserve existing drainage patterns wherever possible.

The DB Team may utilize the existing drainage facilities, provided overall drainage requirements for the Project are achieved. Modifications of existing systems or installations of new drainage systems to create in-line/buried/subsurface/underground detention or stormwater runoff storage shall not be allowed. The use of blind junctions and/or non-accessible structures shall not be allowed unless otherwise approved in writing by GDOT. The DB Team shall not install and/or utilize longitudinal storm sewer pipe under travel lanes unless approved in writing by GDOT. If no modification or upgrading of the existing GDOT stormwater system is required, the DB Team shall at a minimum maintain the existing system. This maintenance includes silt removal from any pipe, ditch, or structure and removal of any debris prior to the use of any existing GDOT stormwater system. This maintenance shall be at the DB Team’s expense.

The DB Team shall base its Final Plans on design computations and risk assessments for all aspects of Project drainage.

The DB Team shall design channels and ditches such that erosion within and downstream of the channels and ditches is controlled by channel protection designed with GDOT’s channel protection design program (http://liningdesign.ce.gatech.edu/). Roadside and median channel design shall be based on the design storm events specified in GDOT’s Drainage Manual. The design high water elevation shall be at least six (6) inches below the roadway’s normal shoulder break point. The travel lane shall not be encroached upon during the 50-year design storm event. On depressed roadways/sections, at low points and sag locations/areas/points, all median drains shall be designed for the 50-year design storm event such that the water will not reach the bottom of the pavement structure. All roadway, berm, surface, and outfall ditches shall be designed such that the 25-year design storm event will not reach the bottom of the pavement structure. A 50-year design storm event shall be used for ditches and channels at low points where flow must escape through an inlet. This requirement does not apply to roadways where water can escape over a curb, roadway, etc. into another channel. If these requirements are not achievable with a channel, the DB Team may design an open concrete-lined conveyance limiting ponding per Section 12.3.2.3, Gutter Spread/Ponding.

The DB Team shall coordinate with FEMA and/or the appropriate local Governmental Entities regarding any impacts to regulatory floodways and floodplains. In the event a Conditional Letter of Map Revision (CLOMR) is required, the DB Team shall obtain local Governmental Entity approval and coordinate the subsequent submission to FEMA as early in the Project timeline as possible. The DB Team shall allow up to one (1) year in the schedule for FEMA approval of any required CLOMR review.
The DB Team shall design the Project to follow FEMA regulations in FEMA regulated floodplains. This may include bridge structures over streams, bridge(s) or bottomless culverts over streams, increasing the tie slope and/or utilizing retaining walls to reduce fill in the floodplain/floodway.

All areas of the Project shall comply with the Post-Construction Stormwater Design Guidelines contained in the Drainage Manual.

Flood damage potential for the completed Project shall not exceed pre-Project conditions.

12.3.1 Surface Hydrology

12.3.1.1 Design Frequencies

The DB Team shall use the Design Discharge Criteria in the Drainage Manual and comply with CFR Part 650-Bridges, Structures, and Hydraulics.

If a design storm frequency is not specified for a given component of the temporary Drainage System, the DB Team shall use the design storm frequency as required for the corresponding facility in the Final Plans.

12.3.1.2 Hydrologic Analysis

The DB Team shall design the Drainage System to accommodate the Project drainage areas. These areas may extend outside of the Project limits.

The DB Team shall perform hydrologic analyses for the design of drainage features during the staging of construction and for the Final Plans for the Project according to the Drainage Manual.

12.3.2 Storm Sewer Systems

Where precluded from handling runoff with open channels or ditches, the DB Team shall design enclosed storm sewer systems to collect and convey runoff to appropriate discharge points. In no instance shall stormwater be conveyed to and/or through the bridge enroll nor released onto the bridge enroll located under a bridge.

The DB Team shall prepare storm sewer analyses, which shall constitute a section of the Drainage Design Report that contains, at a minimum, the following:

1. Drainage area maps with each storm drain inlet and its pertinent data, such as delineated drainage area, topographic contours, runoff coefficients/design curve numbers, times of concentration, land uses, discharges, velocities and headwater elevations.

2. Detailed tabulation of all existing and proposed storm drains. This includes conveyance size and class or gauge; catch basin spacing/location and detailed structure designs.

3. Specifications for the pipe bedding material and structural pipe backfill on all proposed pipes and pipe material alternates.
4. Storm drain profiles, including pipe size, length, type, height of fill, class/gauge, gradient and design hydraulic grade line (HGL); and numbered drainage structures with station offsets from the roadway alignment and elevations.

12.3.2.1 Pipes

Storm drains shall be designed with design flow velocities greater than or equal to three (3) feet per second (fps) or slopes greater than or equal to 0.0100 ft/ft to prevent sedimentation in the pipe. Storm drains shall be designed to prevent surcharging of the system at the flow rate for the design year event.

All storm drains shall be reinforced concrete unless accepted otherwise by GDOT prior to installation. The DB Team shall adhere to the approved Geotechnical Engineering Report and ensure appropriate materials are used pursuant to Section 8.

Minimum pipe inside diameter shall be eighteen (18) inches. GDOT acceptance shall be required for all existing pipes to be utilized with a diameter less than eighteen (18) inches.

Existing pipe systems not meeting GDOT's maximum structure spacing requirement that are not being impacted by the construction of the Project may remain. If an existing system is impacted it shall be upgraded to meet the requirements of this Section 12.

12.3.2.2 Municipal Separate Storm Sewer System (MS4)

The DB Team shall follow requirements in the Drainage Manual for compliance with GDOT's General NPDES Stormwater Permit No. GAR 041000 (MS4 Permit). The DB Team shall also be directly responsible for the minimum control measures within the MS4 Permit, as required in Attachment 12-1 MS4 Responsibilities - Design-Build Project. The DB Team shall also adhere to Special Provision 169 – Post-Construction Stormwater BMP Items (Attachment 12-2). BMP details are available on GDOT’s website, and special grading sheets related to BMP details are posted in the RIDs.

Thirty (30) days prior to the end of each reporting period, as required in the MS4 Permit, the DB Team shall provide to GDOT annual report data covering the portion of GDOT’s MS4 within the Project limits. The DB Team shall submit to GDOT a signed and sealed Post-Construction Stormwater Report prepared per the Drainage Manual for review and approval. Upon GDOT approval, the Report will be sent to EPD per the permit requirements. EPD will have sixty (60) days to disapprove the Report. GDOT will not issue substantial completion until after the 60-day EPD disapproval period ends. The DB Team may proceed with construction at their own risk prior to the 60 days expiring. GDOT will not issue reimbursement for any revisions to installed post construction BMPs as required by EPD.

The DB Team shall:

1. Attend GDOT training courses, Overview of Post-Construction Stormwater (O-PCS), CEI for Post-Construction BMPs (CEI), and Stormwater Pollution Prevention at Facilities (SWPP).
2. Provide GIS data of the existing and proposed storm sewer systems and all ditches within the ROW. This GIS data shall comply with GDOT’s Supplemental Specification 156 – GPS Specifications for Conveyance Structures GIS Mapping (available on GDOT’s website as part of the Supplemental Specifications Modifying the 2013 Standard Specifications, Construction of Transportation Systems, 2016 Edition); the DB Team shall contact GDOT to obtain the inventory standards and MS4 policy guidance prior to any data collection efforts.

3. Clean the existing drainage system sufficiently enough to allow for the proper detailed inspection of the system within the Project limits and as required in Section 19 for any proposed stormwater systems.

12.3.2.3 Gutter Spread/Ponding

The DB Team shall design pavement drainage systems, in both staging of construction and the Project, to limit ponding to the widths listed below for the design storm frequency:

1. For all interstate highways and all roads other than interstates with design speeds of greater than 45 mph; ponding shall be confined within the shoulder. In no event shall any ponding occur in an interstate travel lane.

2. For all roads other than interstates with design speeds of 45 mph or less, ponding shall be confined to within one-half (½) the lane adjacent the gutter/shoulder and the gutter/shoulder.

3. For all bridge decks, ponding shall be limited according to Section 13.2.2 Design Spread and Frequency in the Drainage Manual.

Note: Bicycle lanes are considered part of the shoulder for drainage design purposes.

Concentrated stormwater shall not be allowed/released to flow across any travel lane within the Project. The term “shallow-concentrated” shall be synonymous with “concentrated” with respect to flows across travel lanes. Only sheet flow shall be allowed to flow across travel lanes.

Design temporary drainage systems to restrict gutter spread to the shoulder width to the degree possible. Minimize ponding at flood sensitive locations. The EOR must evaluate all temporary drainage conditions.

12.3.3 Hydraulic Structures (Culverts/Bridges)

The DB Team shall analyze existing and proposed culverts and bridges impacted, replaced, or created by the Project design, for any flooding problems.

For all culverts, the DB Team shall determine the allowable headwater depth (HWd) for the design-year storm per the Drainage Manual and based on items such as potential damage or loss of use to adjacent property, the culvert, roadway, stream and/or floodplain, as well as traffic interruption or hazard to human life.

All hydraulic computations, designs, and recommendations shall be consistent with past studies and projects in the area performed by local, State, or federal agencies.
Where hydraulic design is influenced by upstream storage and/or tidal surges, the analysis of the storage and/or the tidal surges shall be considered in the design of the structure.

Bridge culverts shall have a minimum rise dimension of four (4) feet.

12.3.3.1 Method Used to Estimate Flows

The DB Team shall ensure the selected hydrologic method is appropriate for the watershed conditions.

As appropriate, the DB Team shall utilize flow information within FEMA Flood Insurance Studies (FIS) and any subsequent Letters of Map Revision (LOMR).

For crossings not located within a FEMA FIS or on a gauged waterway, the DB Team shall utilize the required method for calculating the design flows according to the Drainage Manual.

12.3.3.2 Design Frequency

Culverts and storm drain systems shall be designed for the Design Storm Event according to the Design Discharge Criteria in the Drainage Manual. Bridges shall be designed for the fifty- (50-) and one hundred- (100-) year frequencies.

12.3.3.3 Hydraulic Analysis

The DB Team shall evaluate a bridge(s) for contraction and pier scour concerns and shall design for scour protection in accordance with the Drainage Manual.

For bridge abutments in urban areas, the DB Team shall install protection in accordance with Section 15 (Landscape and Hardscape Enhancements).

12.3.3.4 Riverine Bridge/ Bridge Culvert Design

For existing bridges, the DB Team shall analyze each structure with the proposed flows to ensure it provides the required freeboard per the Drainage Manual. If this requirement is not met, the DB Team shall design and construct a replacement structure with sufficient capacity to pass the Design Storm Event flows while providing the required freeboards.

For existing bridge culverts, the DB Team shall analyze each structure with the proposed flows to ensure the headwater does not exceed that of the allowable headwater per the Drainage Manual. If this requirement is not met, the DB Team shall design and construct a replacement structure with sufficient capacity to pass the proposed Design Storm Event with a resulting headwater depth of no greater than the HWd.

Bridge/bridge culvert design shall maintain the existing channel morphology through the structure, if possible.
12.3.3.5 Bridge Deck Drainage

Runoff from bridge decks shall be carried off the bridge and into the adjoining roadway drainage system. The roadway drainage design shall include bridge approach drains to intercept gutter/shoulder flow at each end of the bridge. Stormwater flowing toward the bridge shall be intercepted upstream of the bridge.

Open deck drains are not permissible for bridges passing over environmentally sensitive areas, roadways or railroads. In these situations, if ponding will exceed width limits, runoff shall be collected in inlets and conveyed in a closed deck drain system before discharging outside of these areas.

12.3.3.6 Drainage Report for Hydraulic Structures

The DB Team shall prepare a Hydraulic and Hydrologic (H&H) Study and any other required documentation for all existing and/or proposed river and tidal bridge sites and for culverts that meet any of the conditions listed in the Drainage Manual (Section 12.1) and any Environmental Commitments identified in the approved Environmental Documents. Additional documentation may include the preparation and submittal of any CLOMR or LOMR required for community and/or FEMA coordination. The H&H Study shall further include the detailed calculations with electronic and printed copies of the computer software input and output files, as well as a discussion about hydrologic and hydraulic analysis and reasons for the design recommendations. At a minimum, for each crossing the H&H Study shall include:

Hydrology

1. Drainage area maps with watershed characteristics (hardcopy)
2. Hydrologic calculations (where computer software is used, both hardcopy report and electronic input and output files on a disc)
3. Historical or site data used to review computed flows

Hydraulics and Recommended Waterway Opening and/or Structure

1. Photographs of Site (pre- and post-construction)
2. General plan, profile, and elevation of recommended waterway opening and/or structure
3. Calculations – include a hardcopy report of output, in addition to electronic input and output files for all computer models used for final analysis or for permit request(s) as well as a summary of the basis of the models
4. Cross-sections of waterway (a hard copy plot, plus any electronic data used)
5. Channel profiles

Scour Analysis

1. Channel cross-sections at bridge(s) showing predicted scour depths
2. Calculations and summary of the calculations table, clearly showing predicted scour and assumptions regarding bridge opening and piers (dimensions, shape, etc.) used to calculate predicted scour.

3. Discussion of the potential for long-term degradation/aggradations and effects.

4. Recommendation(s) for abutment protection (type, size, dimensions, etc.).

These H&H Studies shall constitute a section in the Drainage Design Report.

### 12.4 Construction Requirements

The DB Team shall design the Drainage System to accommodate construction staging. The design shall include temporary erosion control, sediment basins and other BMPs needed to satisfy the NPDES and other regulatory requirements. All environmental approval commitments related to drainage design and erosion control shall be included as “notes” on the plans for each stage of construction.

The DB Team shall obtain GDOT acceptance during the Term to utilize any existing stormwater system (all pipe, structure, ditch, detention/retention system or any other component necessary for the conveyance of stormwater) outside the Project limits. Maintenance responsibility and costs shall be as follows during the Term:

1. Costs to reconstruct or upgrade the substandard drainage facility(ies) outside the Project limits, shall be at the sole cost of the DB Team. Rehabilitation of substandard drainage facilities may be considered upon request from the DB Team. The rehabilitation shall meet the useful life as if the substandard drainage system structure was replaced as new.

2. Any stormwater system accepted by GDOT and constructed for the sole purpose of the Project outside of the Project limits shall be maintained by the DB Team at the DB Team’s sole expense.

3. The DB Team, at the DB Team’s expense, shall be responsible for maintenance and restoration of the existing system to its original intended purpose for any accepted existing stormwater system whether used jointly by the DB Team and GDOT or for the DB Team’s sole use.

4. Maintenance work includes silt removal from any pipe, ditch, or structure, and removal of debris prior to the use of any existing GDOT stormwater system.

### 12.5 Deliverables

The DB Team shall submit to GDOT for review and acceptance, a Drainage Design Report per the accepted Construction Phasing Plan, which shall be a complete documentation of all components of the Project’s drainage system. At a minimum, the report shall include:

1. A set of all drainage computations, both hydrologic and hydraulic, with all support data;
2. Hydraulic notes, models, and tabulations;

3. Bridge and culvert designs and Hydraulic reports. (each riverine bridge layout/design shall be submitted at the same time as their corresponding H&H Study);

4. Pond designs, including a graphic display of treatment areas and maintenance guidelines for operation;

5. A correspondence file;

6. Drainage system data (location, type, material, size, and other pertinent information) in a suitable electronic format such as GIS;

7. A post-Construction Stormwater Report with a Post-Construction BMP Infeasibility Report as applicable; and

8. Storm sewer drainage reports (if applicable) including Temporary and Final Drainage System layout with staged erosion control BMP location details.
13 STRUCTURES

13.1 General

The structural Elements of the Project, including bridges, culverts, drainage structures, signage supports, illumination assemblies, traffic signals, retaining walls, and noise barrier, shall be designed and constructed in order to provide the general public a safe, reliable, and aesthetically-pleasing facility.

13.1.1 Standards

The DB Team shall provide activities in this section in accordance with GDOT's Bridge and Structures Design Manual (GDOT Bridge Manual) as the primary reference, the current AASHTO LRFD Bridge Design Specifications (AASHTO LRFD Specifications), other Attachment 3-1 Manuals, and other provisions of the DB Documents.

Where AASHTO LRFD Specifications and GDOT Bridge Manual requirements contradict or conflict with one another, the GDOT Bridge Manual requirements shall take precedence.

Unless otherwise noted, design and detailing for all structural elements to be constructed or rehabilitated and incorporated within the Project (not including future replacement structures) shall be based on the LRFD methodology using the GDOT Bridge Manual as the primary reference.

13.2 Design Requirements

13.2.1 Design Parameters

The DB Team shall ensure that bridges crossing over waterways are designed in accordance with Section 12 and the DB Documents.

The DB Team shall design and construct all new bridge structures to accommodate any planned expansions or updates of each facility by its respective Governmental Entity or GDOT as designated in their respective current transportation master plans. The current transportation master plans (if any) can be found in Section 11 of Volume 2. For the purpose of the Technical Provisions, superstructure is the portion of the bridge above and including the bearings, and the substructure is the remaining portion of the bridge below the superstructure.

Longitudinal expansion joints shall not be placed in the travel lane.

The DB Team may use GDOT Construction Standards and Details on the Project without updating to meet LRFD requirements. If the DB Team chooses to modify any of the standards and details, the design shall be updated to meet LRFD requirements.
Vertical Clearances

New bridges constructed over interstate highways shall provide a minimum vertical clearance of seventeen (17) feet. New box girder bridges shall be seventeen (17) feet six (6) inches. All bent substructure elements over interstate highways, including straddle bents, shall provide a minimum vertical clearance of seventeen (17) feet six (6) inches. New bridges constructed over other roads such as State, Rural Secondary, and Urban Routes, as defined by the GDOT Design Policy Manual, shall provide a minimum vertical clearance of sixteen (16) feet nine (9) inches.

Bridge Design Live Loads and Load Ratings

All new or widened bridges must be designed to carry an HL-93 vehicle live load. The DB Team is responsible for ensuring that each bridge meets the load rating requirements for the design vehicle, as well as all current state legal live loads. GDOT will perform a load rating as part of the final review for each bridge design. Load ratings will be performed according to the current GDOT policy and practices.

Seismic Design

Bridges shall be designed in accordance with the seismic design guidelines in the GDOT Bridge and Structures Manual, as well as the current AASHTO LRFD Bridge Design Specifications.

Fatigue Design

Fatigue design shall be in accordance with the GDOT LRFD Bridge and Structures Manual, as well as the current AASHTO LRFD Bridge Design Specifications.

13.2.2 Bridge Decks and Superstructures

Timber bridges, masonry bridges, unpainted weathering steel, and structural plate arches will not be permitted. Bridges shall not use intermediate hinges.

The DB Team shall minimize the number of deck joints wherever possible. The DB Team shall locate joints to provide for maintenance accessibility and future replacement.

To the extent possible, the DB Team shall make bridge superstructures, joints, and bearings accessible for long-term inspection and maintenance. The DB Team shall make open-framed superstructures accessible with walkways or by use of ladders or an under-bridge inspection truck.

The DB Team shall provide concrete diaphragms for pre-stressed concrete beams spanning 40 feet or more.

Galvanized steel diaphragms are allowed on pre-stressed concrete beam bridges, with the following limitations:

1. Only structures with substantial clearance (20 feet or greater) over roadways are acceptable locations for galvanized steel diaphragms.
2. Structures over waterways are acceptable locations for galvanized steel diaphragms.

3. Concrete diaphragms shall be used over roadways where the beams may be impacted by over-height loads.

4. Bolts shall not be exposed on the exterior face of concrete beams.

5. Only steel X-type cross frames shall be used.

The maximum weight of beam that may be transported on State routes is limited. Shipping weights larger than 150,000 pounds, including the truck, shall be submitted to GDOT to determine if a special hauling route is necessary for delivery.

Bolted field splices are allowed for use on steel girders, provided the following requirements are met:

1. Bolts shall be placed in double shear.

2. Splice plates and bolts shall not encroach on the slab design thickness.

3. Direct Tension Indicators (DTIs) shall not be used.

The DB Team shall install locked entryways on all hatches and points of access.

Cover plates are prohibited for use on new steel beams. When widening existing bridges “in kind” that have cover plated members, use a larger member size that will not require plates. For strengthening and rehabilitation work of existing steel beams, the DB Team shall determine if there are other methods available to provide the required capacity before submitting to GDOT for acceptance. If accepted, cover plates shall be checked for fatigue in accordance with GDOT and AASHTO LRFD guidelines.

Fracture critical members (FCMs) shall not be used for bridges. Steel box girder straddle bent caps are considered FCMs due to their non-redundant properties and will not be permitted on the Project. Post-tensioned concrete straddle bent caps are not considered FCMs, as the post-tensioning strands provide internal redundancy. Bridges designed using rolled steel beams, steel plate girders, pre-stressed concrete I-beams and pre-stressed concrete bulb-tee beams as the main members of the bridge superstructure shall be designed and constructed using a minimum of four (4) beams in the bridge typical section. Joints for all grade separation structures shall be sealed.

Box girder superstructures and substructures shall be accessible without impacting traffic below. The DB Team shall make box girders and box beam pier caps with a minimum inside depth of six (6) feet to facilitate interior inspection. The DB Team shall include a minimum access opening of three feet (3'-0") diameter into all cells and between cells of the girders or pier caps to allow free flow of air during inspections. The outside access opening cover shall hinge to the inside of the box girder and pier caps. An electrical system (110V and 220V) shall be incorporated inside the box girder and pier caps with lighting and power outlets. The DB Team shall install air-tight sealed and locked entryways on all hatches and points of access.
13.2.3 Bridge/ Retaining Wall Foundations

The foundation design shall be based on the recommendations of the accepted Bridge or Wall Foundation Investigation report and the requirements of Section 8 of Volumes 2 and 3. The DB Team shall perform LRFD bridge and wall foundation investigations for all proposed walls and bridges to be constructed on this Project. Except as provided in Section 8 of Volume 2, any previously accepted reports provided by GDOT are for informational purposes only and GDOT does not certify or warranty the information contained in these reports.

For bridges crossing streams or any other bodies of water, all foundations shall be evaluated and designed to account for the effects of scour. The design shall include the recommendations of the hydraulics and hydrological report to ensure that footings, piles and caissons/drilled shafts have the proper embedment below the scour line. Protection of slopes with rip rap shall be in accordance with the recommendations of the hydraulics report.

Foundations shall be designed based on LRFD methodology in accordance with Section 8, GDOT and AASHTO guidelines.

13.2.4 Bridge Railing and Barriers

All barrier systems used on the Project shall meet current crash test and other safety requirements as determined by GDOT. All testing and associated costs for non-standard railings shall be the sole responsibility of the DB Team and shall be accomplished through a third party acceptable to GDOT.

13.2.5 Retaining Walls

To the extent possible, the DB Team shall design and construct to provide embankments without the use of retaining walls. Where earthen embankments are not feasible, the DB Team may use retaining walls.

Metal walls, including bin walls and sheet pile walls, recycled material walls, and timber walls, shall not be permitted.

If pipe culverts are to extend through the retaining walls or noise barriers, the pipe shall be installed so that no wall expansion joints are located within two pipe diameters from centerline of the pipe or under the wall.

Weep holes through retaining wall faces shall only be located at the base of the walls.

Modular walls employing interlocking blocks shall not be used where surcharge loads from vehicular traffic are present or as part of bridge abutments.

Mechanically Stabilized Earth (MSE) walls shall not be used to support spread footing abutment foundations on the Project.
13.2.6 Aesthetics

The DB Team shall design retaining/structural walls to be similar in color, texture, and style to other Elements present in the entire Project, such as structures, landscaping, and other highway components.

All embellishments for structural Elements shall be coordinated with the DB Team’s structural design team to facilitate constructability and maintain safety requirements. Structural element surfaces exposed to public view shall meet the requirements of the Standard Specifications, Construction of Transportation Systems.

No exposed conduits shall be allowed on bents, columns, bridge beams, overhangs or any other visible surface. The DB Team is to minimize drain pipe exposure to public view.

All bridge substructure columns shall be consistent in form and texture, with similar shapes and details used for all bridges on the Project.

Bridges with all or part of the structure visible to traffic either passing beneath the bridge or travelling in lanes adjacent to the bridge shall use constant depth of fascia beams along the entire length of the bridge to maintain a uniform appearance. An exception to this requirement is at locations where the fascia beam material changes from steel to concrete or vice versa. In this case, cheek walls shall be used at piers to mask transitions where superstructure depth change is required due to the change in material type. Spans crossing mainline interstates shall be constructed with the same superstructure type over both directions of traffic; for example, do not span one direction with concrete and the other direction with steel.

Bridges that are not visible to traffic either passing beneath the bridge or travelling in lanes located adjacent to the elevated portions of the bridge are not required to have all fascia beams constant throughout the bridge length.

13.2.7 Drainage Structures

In developing the design of drainage structures, the DB Team shall account for maximum anticipated loadings. “Step down” design shall not be utilized for any part of the proposed drainage system.

Energy dissipators, if used, shall be considered as structural Elements.

13.2.8 Sign, Illumination, and Traffic Signal Supports

The DB Team shall be responsible for the design of overhead sign supports to accommodate a full load of signs for the Project. The DB Team shall use sign bridge (Type I), butterfly (Type III), or combination (Type IV) in accordance with GDOT’s Attachment 3-1 Manuals. Type II sign (cantilever type) structures are not permitted.

Support columns for Type I, III, and IV overhead sign structures or traffic signal mast arms shall not be mounted to any portion of the new or existing bridge superstructure. Where an overhead sign structure or mast arm is required to be placed on a bridge, it shall be mounted either on the bridge substructure directly, such as the concrete pier cap, or on
13.2.9 Widening/Modification of Existing Structure

Structures to be widened are listed in Section 13.2.9 of Volume 2. The DB Team shall rehabilitate/strengthen/replace that portion of the existing structure as recommended by the most recent bridge condition and bridge deck condition surveys, and the portions of the existing structure that must be strengthened or upgraded as a direct result of the widening. Examples include strengthening of an existing fascia beam or improving the strength of a pier cap to meet the increased load capacity requirements due to the new load distribution on those elements. Any portion of the existing bridges damaged as a result of the widening operations will be replaced or repaired at the DB Team’s cost, as determined by GDOT. The DB Team shall provide any studies, calculations, and plans required for GDOT review and acceptance prior to any bridge widening or modification.

13.2.10 Reserved

13.3 Construction Requirements

13.3.1 Concrete Finishes
Concrete finishes shall comply with Section 15 and other requirements of the DB Documents.

13.3.2 Structure Metals
Welding shall be in accordance with the requirements of the American National Standards Institute (ANSI)/AASHTO/ American Welders Association (AWS) D1.5M/D1.5:2010 Bridge Welding Code.

13.4 Final Bridge Inspection Prior to Substantial Completion

GDOT will inspect all bridges constructed prior to Substantial Completion. GDOT will perform the initial bridge ratings as part of this Work. Bridges shall not be opened to traffic until accepted by GDOT.

The DB Team shall provide to GDOT an overall schedule of completion for each structure in accordance with the Construction Phasing Plan and coordinate an inspection schedule with GDOT that will meet the Substantial Completion Date.
13.5 Deliverables

Preliminary Bridge Plan Layouts

The DB Team shall prepare Preliminary Bridge Plan Layouts in accordance with the GDOT Bridge Detailing Manual guidelines.

Additionally, the DB Team shall provide a typical section that indicates the following information:

1. The center-to-center spacing of girders
2. Overhang or distance from outside edge of slab to center of exterior girder: This distance (overhang) shall meet AASHTO requirements, but shall not exceed 4'-7½" or one half of the adjacent beam spacing, whichever is less. Overhangs shall be a minimum width of one-half top beam flange plus 6 inches.
3. Cross slope of the deck.
4. Deck thickness between girders and deck thickness at the centerline of girder measured from the top surface of deck to top of the flange
5. Barrier location, height and width
6. Gutter to gutter and out-to-out dimensions
7. Location of the profile grade

The DB Team shall also provide any drawing and/or narrative description of the construction scheme necessary to indicate how the bridge is to be built, including traffic handling sketches and temporary barrier locations.

Preliminary Wall Plans

The DB Team shall prepare Preliminary Wall Plans in accordance with the GDOT Bridge Detailing Manual guidelines. The acceptable wall types are as follows:

1. MSE (Mechanically Stabilized Earth)
2. Alternate wall types, including cast-in place walls, are permissible. Soil-nail type walls and modular block type walls will not be permitted directly adjacent to areas subject to roadway surcharge loads, including bridge end bents.
3. Any construction sequence requirements that will affect the construction of the walls and which will have to be accounted for in the preparation of retaining wall plans.
Bridge and Wall Construction Plans

After the preliminary bridge and wall layouts have been accepted by GDOT, the DB Team shall prepare final plans. The DB Team shall arrange a meeting with GDOT to specifically discuss how the plans will be prepared prior to beginning plan preparation on the Project.

The DB Team shall provide Submittals as required in Section 3, Attachment 3-1 Manuals, and in the DB Documents in addition to the following:

- Hardscape Enhancement Plan for bridges, retaining walls, noise barriers, sign structures, and other structure components as required in Section 15.
14 RESERVED
15 LANDSCAPE AND HARDSCAPE ENHANCEMENTS

15.1 General Requirements

Aesthetic treatments play a significant role in the Project. This Section 15 defines the minimum requirements with which the DB Team shall design and construct aesthetic treatment enhancements for the roadway and landscaping Elements of the Project. Aesthetic treatments shall be designed to harmonize with the indigenous landscape and architecture.

15.2 Administrative Requirements

The intent of this Section 15 is to provide guidelines on enhancement value for both the users and the onlookers of the corridor and to provide a roadway corridor with continuity and attractiveness through the use of comprehensive aesthetic treatments. This Section 15 presents minimum landscape and hardscape design requirements for the Project.

15.2.1 Reserved

15.2.2 Reserved

15.2.3 Reserved

15.3 Design Requirements

15.3.1 Reserved

15.3.2 Walls

The DB Team shall design noise barriers and retaining/structural walls to be similar in color, texture, and style to other Elements present in the entire Project such as structures, landscaping, and other highway components.

The DB Team shall apply aesthetic treatments to the vertical surfaces of retaining and sound barrier walls where the surface is visible from the roadway or adjacent houses.

Consistent treatments shall be used for retaining walls and noise barriers that articulate the design themes established for the Project.

The DB Team shall pay special attention to themed design embellishments and utilize high-quality finishes and materials at interchanges.

15.3.3 Bridges and Other Structures

All embellishments for structural Elements shall be coordinated with the DB Team’s structural design team to facilitate constructability and maintain safety requirements. Structural element surfaces exposed to public view shall meet the requirements of the GDOT Standard Specifications.
No exposed conduits shall be allowed on bents, columns, bridge beams, overhangs, or any other visible surface. Drain pipe exposure shall be minimized to public view.

All bridge substructure columns shall be consistent in form and texture, with similar shapes and details used for all bridges.

Bridges with all or part of the structure visible to traffic, either passing beneath the bridge or travelling in lanes adjacent to the bridge, shall use constant depth of fascia beams along the entire length of the bridge to maintain a uniform appearance. An exception to this requirement is at locations where the fascia beam material changes from steel to concrete or vice versa. In this case, cheek walls may be used at piers to mask transitions where superstructure depth change is required due to the change in material type.

Bridges that are not visible to traffic either passing beneath the bridge or travelling in lanes located adjacent to the elevated portions of the bridge are not required to have all fascia beams constant throughout the bridge length.

15.3.4 Reserved
15.3.5 Reserved
15.3.6 Reserved
15.3.7 Reserved
15.3.8 Reserved

15.4 Construction Requirements

Prior to start of production of any embellishment element, the DB Team shall provide GDOT samples, mock ups, or catalog cuts for review and approval.

The DB Team shall provide GDOT sample panels of textured concrete surfaces a minimum of sixty (60) days in advance of starting construction for review and approval.
16 SIGNING, PAVEMENT MARKING, SIGNALIZATION

16.1 General
The DB Team shall design and construct all signing, delineation, pavement markings, and signalization for the Project.

16.1.1 Standards
The DB Team shall provide activities in this Section 16 in accordance with Attachment 3-1 Manuals, Government Approvals, and other provisions of the DB Documents.

16.2 Administrative Requirements

16.2.1 Meetings
The DB Team shall arrange and coordinate all meetings with local agencies that will assume responsibility for maintaining and operating traffic control devices including traffic signals. The DB Team shall provide GDOT with notification of such meetings a minimum of ten (10) Business Days prior to the start of the meeting. GDOT, in its discretion, may attend such meetings.

The DB Team shall arrange and coordinate all meetings with requesting agencies or individuals regarding special signs.

16.3 Design Requirements

16.3.1 Final Plans
The DB Team shall submit the Preliminary and Final Plans for the signing, delineation, pavement marking, and signalization for GDOT review and acceptance.

See Section 7, Right of Way - Additional Properties, for requirements related to any Additional Property acquisitions needed to place any required signs outside Proposed ROW.

16.3.2 Permanent Signing and Delineation
Signs for the Project shall include all new signs required for the Project, as well as replacing existing signs and structures impacted by the Project. The DB Team’s design shall include the locations of proposed ground-mounted and overhead signs, as well as existing signs that are to remain, graphic representation of all signs, proposed pavement markings, delineation placement, guide sign and special sign details, clearance diagrams, and structural and foundation requirements. Signs shall be located in a manner that avoids conflicts with other signs, vegetation, CMS, lighting, and structures. The DB Team shall ensure that signs are clearly visible, provide clear direction and information for users, and comply with all applicable Attachment 3-1 Manuals requirements. The DB Team shall ensure that placement, construction and installation activities of signage shall avoid
impacts to all environmentally sensitive resources. The DB Team shall prepare preliminary and final unveiling plans for permanent signing 120 days and 60 days, respectively, prior to opening to traffic.

The DB Team shall ensure that all sign placements meet appropriate sight line requirements and standards. All sign structures and overhead signs shall be designed and located to ensure that they and any existing GDOT overhead signs have sight distance of at least 1,000 feet and shall meet any other MUTCD or GDOT Signing and Marking Design Guidelines, allowable sign spacing requirements.

The DB Team shall review with GDOT all requests for new signs, including traffic generators, or modifications of existing sign legend. Such requests are subject to GDOT’s acceptance.

Any existing signs and sign structures impacted by the Project or in conflict with proposed signs shall be replaced with new signs and structures that comply with Attachment 3-1 Manuals, or as otherwise approved by GDOT.

All overhead signs on a single structure shall be the same height with the exception of general information or regulatory signs such as Rest Area or an R554-X.

Three overhead advance guide signs and one overhead Exit Direction sign, meeting current Attachment 3-1 design manuals requirements and guidance, shall be required for all freeway to freeway interchanges within the Project area.

Arrow per lane guide signs shall be required for all multi-lane exits at major interchanges that have an optional exit lane that also carries the through route and for all multi-lane freeway to freeway splits that include an option lane. Sign attachments to any existing roadway bridge will not be allowed.

Support columns for Type I, III, and IV overhead sign structures shall not be mounted to any portion of the new bridge superstructure. When an overhead sign structure is required to be placed on a bridge it shall be mounted either on the bridge substructure directly, such as the concrete pier cap, or on a pier and foundation separate from the bridge entirely. For a sign structure that is mounted to the pier cap, the bridge pier must be designed for the additional loads and forces the sign structure will induce on the bridge substructure, including dead load, ice load, wind load and vibration. Loads shall be developed in accordance with AASHTO Standard Specifications for Highway Bridges, 17th Edition and the current edition of the AASHTO Standard Specification for Structural Supports for Highway Signs, Luminaires and Traffic Signals. For a sign structure mounted to a foundation that is independent from the bridge, the design of the sign foundation shall be in accordance with the current edition of the AASHTO Standard Specification for Structural Supports for Highway Signs, Luminaires and Traffic Signals.

Supplemental signs on interstate highways shall comply with MUTCD. Guidance on destinations is provided in GDOT’s Policies and Procedures 6775-9.
The DB Team shall install truck restriction signs (R554-X) on interstates in locations of three (3) lanes or more of travel in one direction. Signs shall be mounted on overhead road bridge structures or on an overhead sign structure at interchanges with underpass. Signs shall be designed as per GDOT Detail T-7. For locations on interstates with (two) 2 lanes of travel in one direction, the R560-3 sign shall be mounted on the shoulder at least once between interchanges; the R560-3 sign shall be designed as per GDOT Detail T-5A.

16.3.3 Project Signs – Outside the Existing and Proposed ROW

For signs located outside the Existing ROW, Proposed ROW, and Additional Properties, but within a public ROW, the DB Team shall install the signs in existing rights of way controlled by local or other Governmental Entities. The DB Team shall coordinate with applicable Governmental Entities for the design, approval, and installation of such signs. This shall include any trailblazing signing required for the Project.

16.3.4 Reserved

16.3.5 Specific Service Signs

In addition to the warning, regulatory, and guide signs within the Project, GDOT or Governmental Entities may allow specific service signs, such as LOGO signs, to be installed. The DB Team shall coordinate and cooperate with GDOT or any third party performing such work. The DB Team shall remove and remount any LOGO sign that conflicts with a proposed sign installation and also allow for proper sign spacing in accordance with GDOT Signing and Marking Design Guidelines and the MUTCD.

The DB Team shall contact Georgia Logos, LLC (770-447-6399) prior to removing or resetting LOGO signs. Cost for removing, resetting, and maintaining LOGO signs as necessary shall be included in the Contract Sum. Existing LOGO signs shall be maintained during construction on a moveable structure. Any LOGO signs damaged during construction shall be replaced at no additional cost.

16.3.6 Sign Support Structures

The DB Team shall determine foundation types and design sign foundations based upon geotechnical surveys/tests. Sign support structures shall be designed in accordance with GDOT Signing and Marking Design Guidelines and AASHTO’s Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals. The DB Team design of the structural support for overhead signs shall be provided to GDOT and must provide for the maximum allowable sign area that can be placed onto the structure support as defined in GDOT Signing and Marking Design Guidelines. Type III structures shall be designed to accommodate at least five hundred fifty (550) square feet of sign area. A GDOT structural support number shall be placed on the outside vertical support of the structure. Requirements for the alphanumeric code are specified in the GDOT Signing and Marking Design Guidelines. The DB Team shall use sign bridge (Type I) or butterfly (Type III) overhead sign structures in accordance with GDOT’s related standard specifications, policies, guidelines, and Attachment 3-1 Manuals. Designs for sign supports shall also comply with requirements in Section 13, Structures. Type II cantilever
signs shall not be used for sign installations. The DB Team assumes all responsibility for ensuring that any existing overhead sign structure that has a change in design sign area and/or load due to new or revised signs must meet all structural requirements in the GDOT Signing and Marking Design Guidelines and AASHTO’s Standard Specifications for Structural Supports for Highways Signs, Luminaires, and Traffic Signals.

16.3.7 Permanent Pavement Marking

The DB Team shall ensure that the design and installation of all pavement markings including Raised Pavement Markings (RPM) comply with the Attachment 3-1 Manuals. RPMs shall be installed where new pavement marking is provided.

16.3.8 Permanent Signalization

16.3.8.1 Traffic Signal Requirements

The DB Team shall design and install fully-actuated permanent traffic signals at all GDOT-permitted intersections within Project limits. In addition, the DB Team shall modify, as appropriate, any existing traffic signals impacted by the Project. The DB Team shall coordinate with GDOT and the applicable local Governmental Entities to define appropriate traffic signal design requirements, local agency oversight of the DB Team’s Work, and final acceptance of traffic signals. The DB Team shall coordinate with local Governmental Entities for synchronization of traffic signal networks.

The DB Team shall provide interconnection systems between new or modified signals and any other signal system within the Project Site as required by GDOT or the applicable local Governmental Entity. Connection of the completed system to the Governmental Entity’s communications network shall be coordinated with the Governmental Entity. The DB Team shall ensure continuous communication with the traffic signal system within the Project Site, and shall provide all communication hardware/equipment for GDOT or the applicable local Governmental Entity to communicate with the signal systems within the Project Site.

The DB Team shall provide both pedestrian and vehicle detectors at all traffic signals per GDOT and/or applicable local Governmental Entity’s (maintaining agency) requirements within the Project Site.

The DB Team shall coordinate with the GDOT TMC and the GDOT District Traffic Operations to ensure that all signalized locations are permitted prior to submission of Final Plans.

16.3.8.2 Traffic Signal Timing Plans

The DB Team shall coordinate and implement signal timing plans that optimize traffic flows and provide signal coordination with adjacent intersections and arterials for all existing and new traffic signals, modified signals, and interconnected signals. The DB Team shall obtain acceptance from GDOT or applicable local Governmental Entity for the initial signal timings and updating signal timing as necessary to maintain optimized flow.
16.3.8.3 Traffic Signal Permit

As part of the design process, the DB Team shall be responsible for obtaining necessary traffic signal permit or permit revisions by following applicable GDOT and/or local Governmental Entities signal permit process(es), prior to any new signal installation or existing signal modification.

16.3.8.4 Traffic Signal Support Structures

As part of the design process, the DB Team shall coordinate with GDOT and the local Governmental Entities to determine the type of acceptable traffic signal support structures. The DB Team shall obtain the maintaining agency’s acceptance of traffic signal support structures to be used on new signal installations.

16.4 Construction Requirements

16.4.1 Permanent Pavement Marking

The DB Team shall install full pattern pavement markings on all pavement courses before any roadway is opened to traffic in conformance with the Attachment 3-1 Manuals. RPMs shall be placed and/or maintained when the roadway is open to traffic.

Before placing any permanent pavement markings, the DB Team shall provide GDOT a layout indicating the proposed location of such items.

16.4.2 Permanent Signing and Delineation

The DB Team shall use established industry and utility safety practices when erecting or removing signs located near any overhead or underground utilities, and shall consult with the appropriate Utility Owner(s) prior to beginning such work.

The DB Team shall maintain all applicable advance guide signs and/or exit direction signs in place at all times and shall not obstruct the view of the signs to the motorist. The DB Team shall replace any other removed signs before the end of the work day.

Signing reflectivity shall conform to the Attachment 3-1 Manuals.

Before placing any permanent signs, delineation, third-party signs, or non-standard sign structures, the DB Team shall provide GDOT a layout as part of the Final Plans indicating the proposed location of such items. Overhead sign structures and locations shall be submitted for review and acceptance by the GDOT Bridge Design and Maintenance Office.

16.4.3 Permanent Signalization

The DB Team shall coordinate with the Utility Owner(s) and ensure necessary power service is initiated and maintained for permanent signal systems.

The DB Team shall, after implementing accepted timing plans, provide GDOT and Governmental Entities (maintaining agencies) responsible for operation and maintenance
of the traffic signal system legible written documentation of all intersection characteristics, timing plan parameters and installation information necessary for GDOT or the Governmental Entity to incorporate the completed signal installation into the central intersection management software being used.
17 INTELLIGENT TRANSPORTATION SYSTEMS

Refer to Volume 2 for all Intelligent Transportation System requirements.
18 TRAFFIC CONTROL

18.1 General
The DB Team shall provide for the safe and efficient movement of people, goods, and services through and around the Project while minimizing negative impacts to users, residents, and businesses.

18.1.1 Standards
The DB Team shall provide activities in this section accordance with Attachment 3-1 Manuals, Government Approvals, and other provisions of the DB Documents.

18.2 Administrative Requirements

18.2.1 Transportation Management Plan
The DB Team shall prepare and implement a Transportation Management Plan (TMP), if required, that meets the requirements of the FHWA Work Zone Mobility and Safety Program which can be found at:

http://www.ops.fhwa.dot.gov/wz/resources/final_rule/tmp_examples/tmp_dev_resources.htm

At a minimum, the TMP shall include descriptions of the qualifications and duties of the traffic engineering manager, traffic control coordinator, Worksite Traffic Control Supervisor (WTCS), and other personnel with traffic control responsibilities. Additional requirements of the TMP are below:

1. Procedures to identify and incorporate the needs of transit operators, Utility Owners, Governmental Entities, local governmental agencies, emergency service providers, school districts, business owners, and other related users, Customer Groups or entities in the Project corridor and surrounding affected areas.

2. Procedures for obtaining acceptance of detours, road and lane closures and other traffic pattern modifications from applicable Governmental Entities, and implementing and maintaining those modifications. At a minimum, these procedures must include:
   a. The DB Team shall notify the traveling public by placing CMSs a minimum of seven (7) days in advance of actual roadway closure or major traffic modifications. Where available and when possible, the DB Team shall coordinate and utilize overhead changeable message signs on the regional ITS system.
   b. The DB Team shall utilize off-duty uniformed police officers for mainline lane closures.

3. Procedures for signing and marking transitions during construction from one stage to the next and from interim to permanent signing and marking.
4. Procedures for maintenance and replacement of traffic control devices, including pavement markings and traffic barriers, if used.

5. Procedures to regularly evaluate and modify, if necessary, traffic signal timings, and the procedures for the development, GDOT acceptance (and local Governmental Entity acceptance, if necessary), implementation, testing, and maintenance of all affected signals.

6. Procedures to coordinate with the appropriate Governmental Entities operating signal networks along the Project or Project detour routes to ensure temporary system compatibility, establish responsibilities for temporary signal installation, maintenance, operation and removal, and coordinate traffic signal timing with local signal networks.

7. Procedures and processes for the safe ingress and egress of construction vehicles in the work zone.

8. Provisions to provide continuous access to established truck routes and Hazardous Material (HazMat) routes, and to provide suitable detour routes, including obtaining any acceptances required by the appropriate governmental entities for these uses.

9. Procedures to modify plans as needed to adapt to current Project circumstances.

10. If required, procedures to communicate TMP information to the DB Team’s public information personnel and notify the public of maintenance of traffic issues in conjunction with the requirements of Section 2.7 of Volume 2.

11. Descriptions of contact methods, personnel available, and response times for any deficiencies or Emergency conditions requiring attention during off-hours.

The TMP shall be submitted within one hundred twenty (120) days from NTP 1. The DB Team must obtain GDOT acceptance prior to NTP 3.

The safe, convenient passage of the traveling public shall be ensured by the DB Team at all times. The DB Team shall prepare contingency traffic control plans for use in relieving travel delays. If in GDOT’s sole opinion, sustained traffic control placement creates unnecessary hindrance to the travelling public, the DB Team shall implement contingency plans that will alleviate traffic congestion immediately or cease traffic interruptions immediately upon notification from GDOT.

18.2.2 **Worksite Traffic Control Supervisor (WTCS)**

The DB Team shall designate a qualified individual as the WTCS. The WTCS shall be responsible for selecting, installing, and maintaining all traffic control devices in accordance with the Plans, Specifications, Special Provisions and the MUTCD. The WTCS shall be currently certified by the American Traffic Safety Services Association (ATSSA) Work Site Traffic Supervisor Certification program or the National Safety Council Certification program. On-line classes will not be accepted.
The WTCS shall be available on a twenty-four (24) hour basis to perform duties. If the Work requires traffic control activities to be performed during the daylight and nighttime hours, it may be necessary for the DB Team to designate an alternate WTCS. An alternate WTCS must meet the same requirements and qualifications as the primary WTCS and be accepted by GDOT prior to beginning any traffic control duties. The WTCS's traffic control responsibilities shall have priority over all other assigned duties.

As the representative of the DB Team, the WTCS shall have full authority to act on behalf of the DB Team in administering the Traffic Control Plan. The WTCS shall have appropriate training in safe traffic control practices in accordance with Part 6 of the MUTCD. In addition to the WTCS, all other individuals making decisions regarding traffic control shall meet the training requirements of the Part 6 of the MUTCD.

The WTCS shall have a copy of Part 6 of the MUTCD and the Contract on the Site. Copies of the current MUTCD may be obtained from the FHWA web page at http://mutcd.fhwa.dot.gov.

The WTCS shall supervise the initial installation of traffic control devices. GDOT, prior to the beginning of construction, will review the initial installation. Modifications to traffic control devices as required by sequence of operations or staged construction shall be reviewed by the WTCS.

Any Work performed on interstate highway or limited access highway right-of-way that requires traffic control shall be supervised by a submitted/approved certified WTCS. No work requiring traffic control shall be performed unless the certified WTCS is on the work site. Failure to maintain a Certified WTCS on the work site will be considered as non-performance under Volume 1, Exhibit 18.

The WTCS shall be available on a full-time basis to maintain traffic control devices with access to all personnel, materials, and equipment necessary to respond effectively to an emergency situation within forty-five (45) minutes of notification of the emergency.

The WTCS shall perform inspections, at a minimum once a month, to ensure that traffic control is maintained. For all interstate and limited access highways, the WTCS shall perform, as a minimum, weekly traffic control inspections. The inspections shall start with the installation of the advance warning signs and continue until a Maintenance Acceptance is issued or when the punch list is completed.

An inspection shall include both daytime and nighttime reviews. The inspection shall be reported to GDOT on a Traffic Control Inspection Report (TC-1). Unless modified by the special conditions or by GDOT, routine deficiencies shall be corrected within a twenty-four (24) hour period. Failure to comply with these provisions shall be grounds for dismissal from the duties of WTCS and/or removal of the WTCS from the Project. Failure of the WTCS to execute his duties shall be considered as non-performance. GDOT will periodically review the Work for compliance with the requirements of the Traffic Control Plan.
On projects where traffic control duties will not require full time WCTS supervision, GDOT may allow the DB Team’s Project superintendent, foreman, subcontractor, or other designated personnel to serve as the WTCS as long as satisfactory results are obtained. Nevertheless, the individual shall meet the requirements and perform the duties of a WTCS.

### 18.3 Design Requirements

#### 18.3.1 Traffic Control Plans

The DB Team shall use the procedures in the TMP (if applicable) and the guidelines of the MUTCD, AASHTO’s Roadside Design Guide, as well as comply with GDOT Special Provision 150 – Traffic Control to develop detailed traffic control plans which provide for all Construction Phases and construction stages, as well as all required traffic shifts procedures.

The DB Team shall produce a traffic control plan for every Construction Phase that impacts traffic. Each traffic control plan shall be submitted to GDOT for review a minimum of fourteen (14) days prior to implementation. The traffic control plan shall include details for all detours, traffic control devices, striping, and signage applicable to each Construction Phase. Information included in the traffic control plans shall be of sufficient detail to allow verification of design criteria and safety requirements, including typical sections, alignment, striping layout, drop off conditions, and temporary drainage. The traffic control plans shall clearly designate all temporary reductions in speed limits. Changes to posted speed limits will not be allowed unless specific prior acceptance is granted by GDOT.

Opposing traffic on a divided roadway shall be separated with appropriate traffic control devices in accordance the MUTCD based on the roadway Design Speed and Attachment 3-1 Manuals.

The DB Team shall maintain signing continuity on all active roadways within or intersecting the Project at all times.

Throughout the Term, the DB Team shall ensure all streets and intersections remain open to traffic to the greatest extent possible by constructing the Work in stages. The DB Team shall maintain access to all adjacent streets and shall provide for ingress and egress to public and private properties at all times during the term of the Project.

The DB Team shall prepare public information notices, if required, in coordination with Section 2.7, in advance of the implementation of any lane closures or traffic switches. These notices shall be referred to as Traffic Advisories.

#### 18.3.1.1 Roadway Guidelines

The DB Team shall produce traffic control plans for periods of construction in accordance with Attachment 3-1 Manuals, Special Provision Section 150, and the DB Documents.
18.3.1.1 Design Parameters for Traffic Control

**Design Vehicle:** Turning movements shall accommodate a design vehicle specified by the GDOT Design Policy Manual for specific road classifications. Turning movements on all other local streets and driveways shall, at a minimum, provide similar characteristics as existing Geometry.

**Work Zone Speed Limits:** The work zone speed limits on Interstate and State Highways shall be in conformance with Special Provision 150.

**Number of Lanes:** Except as allowed by Section 18 of Volume 2, the minimum number of lanes to be maintained shall be the number of lanes currently available on each controlled access facility. Lane closures on other roadways may be considered as long as all traffic patterns and accesses are not reduced and are maintained.

**Lane Widths:** During construction, the minimum lane width for main lanes, frontage roads and major crossing streets is eleven (11) feet. For minor crossing streets, GDOT may, in its sole discretion, allow ten-foot (10’) lanes in limited circumstances during construction for short distances after reviewing the DB Team’s traffic control plan. See Volume 2 for additional information.

18.3.1.2 Allowable Shoulder/Lane/Roadway Closures and Traffic Stage Changes

The DB Team shall provide GDOT and appropriate Customer Groups a minimum of two (2) weeks advance notice in writing for lane/shoulder closures and/or traffic stage changes planned to be in effect longer than twenty-four (24) hours, and a minimum of twenty four (24) hours advance notice for lane closures that are planned to be in effect less than twenty four (24) hours, using all appropriate tools as needed. The DB Team shall coordinate the closure restrictions with GDOT on all lane/shoulder closures (or an event that results in lane closures) into GDOT’s ITS web-based information tool.

Closures must be coordinated with adjacent projects to ensure the safe convenient passage of the traveling public. During construction of the Project, GDOT will facilitate coordination with all local entities for traffic control.

**Lane and Shoulder Closure During Design-Build Period**

The DB Team may reduce the number of travel lanes in accordance with the restrictions in Section 18 of Volume 2.

Additional lanes may be closed during off peak or nighttime hours upon receipt of written permission from GDOT. Consideration will be given to traffic data collected in VPH/lane formatting during allowed closure periods that clearly demonstrates industry-accepted traffic flow ratios can be maintained.
Full Roadway Closure

The DB Team will not be allowed any full roadway (all lanes and shoulders) closures unless accepted by GDOT and Governmental Entities having jurisdiction of roadways affected by the closure.

GDOT will have the right to lengthen, shorten, or otherwise modify the foregoing restrictions as actual traffic conditions may warrant. The detour route for these full roadway closures shall be limited to usage of the on- and off-ramps at the mainline interchange locations. The DB Team shall utilize off-duty uniformed police officers for all detours.

Any complete roadway closure will require a Traffic Control Plan to be submitted and accepted by GDOT and Governmental Entities having jurisdiction of roadways affected by the closure. Availability of frontage roads, ramp locations and detour distances shall be considered in the design.

Holiday Restrictions

No Work that restricts or interferes with traffic shall be allowed during the periods specified in the following holiday schedule. GDOT has the right to lengthen, shorten, or otherwise modify these restrictions as actual or projected traffic conditions may warrant.

<table>
<thead>
<tr>
<th>Holiday Period</th>
<th>Restriction Begins</th>
<th>Restriction Ends</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Easter (Friday through Monday)</td>
<td>Friday at 12:00 noon</td>
<td>Monday at 10:00 pm</td>
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<tr>
<td>2. Memorial Day Weekend (Friday through Monday)</td>
<td>Friday at 12:00 noon</td>
<td>Monday at 10:00 pm</td>
</tr>
<tr>
<td>3. Independence Day (July 3 through July 5)</td>
<td>July 3 at 12:00 noon</td>
<td>July 5 at 12:00 noon</td>
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<tr>
<td>4. Labor Day Weekend (Friday through Monday)</td>
<td>Friday at 12:00 noon</td>
<td>Monday at 10:00 pm</td>
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<tr>
<td>5. Thanksgiving Holiday (Wednesday through Sunday)</td>
<td>Wednesday at 5:00 am</td>
<td>Monday at 11:00 pm</td>
</tr>
<tr>
<td>6. Christmas Holiday (December 23 through 26)</td>
<td>December 23 at 5:00 am</td>
<td>December 26 at 11:00 pm</td>
</tr>
<tr>
<td>7. New Year Holiday (December 31 through January 1)</td>
<td>December 31 at 5:00 am</td>
<td>First Business Day following December 31 at 11:00 pm</td>
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18.4 Construction Requirements

Traffic control shall be in accordance with GDOT accepted DB Team’s TMP and applicable provisions of the MUTCD and GDOT Special Provision Section 150 – Traffic Control.

18.4.1 DB Team Responsibility

If at any time GDOT determines the DB Team’s traffic control operations do not meet the intent of the TMP (if applicable) or any specific traffic control plan, the DB Team shall immediately revise or discontinue such operations to correct the deficient conditions.
The DB Team shall provide GDOT the names of the certified WTCS and support personnel, and the phone number(s) where they can be reached twenty-four (24) hours per day, seven (7) days per week.

Workzone law enforcement consists of utilizing uniformed police officer(s) equipped with a marked patrol vehicle and blue flashing lights to enforce traffic laws in construction workzones and the administration of this service. Workzone law enforcement shall be deployed during lane closures, traffic pacing, and at all other times the DB Team determines necessary for the safety of everyone within the Project limits. The DB Team shall be responsible for coordinating and scheduling the utilization of the Workzone law enforcement.

The DB Team shall provide a daily work record compiled on a form provided by GDOT, signed by the police officer(s) and signed by the DB Team’s WTCS attesting that the police officer(s) was utilized during the time recorded. No separate payment will be made for Workzone law enforcement. The DB Team shall be responsible for coordinating, scheduling, and administering Workzone law enforcement.

18.4.2 Access

Existing bicycle and pedestrian access and mobility shall be maintained across all cross streets. Access to existing transit stop locations shall be maintained during construction or reasonable alternative locations shall be provided, if applicable.

18.4.3 Detours

The DB Team shall maintain all detours. A pavement transition, required in accordance with AASHTO’s Roadside Design Guide, GDOT guidelines, and the MUTCD, based on the roadway design speed of the section, shall be provided at all detour interfaces.
19 MAINTENANCE DURING THE DESIGN-BUILD PERIOD

19.1 General

The DB Team shall maintain the Project from NTP 3 through the remainder of the Design-Build Period in a manner that provides a safe and reliable transportation system. Upon NTP 3, the DB Team shall be fully responsible for maintenance.

19.1.1 Standards

The DB Team shall provide activities in this section in accordance with GDOT Standard Specifications 104.05, 105.14, 105.15, Attachment 3-1 Manuals, Government Approvals, and other provisions of the DB Documents.

19.1.2 Reserved

19.1.3 GDOT Obligation to Repair

In the period between the Effective Date and NTP 3, GDOT and/or the appropriate local Governmental Entity will reasonably perform the type of routine maintenance of each Element Category of the existing improvement that normally occurs in GDOT’s highway maintenance and repair program. Neither GDOT nor the appropriate local Governmental Entity is obligated to extend the residual life of any Element through reconstruction, rehabilitation, restoration, renewal, or replacement.

19.2 Construction Maintenance Limits Plan

The DB Team shall provide a Construction Maintenance Limits Plan as a drawing or set of drawings that highlight the exact area of the proposed construction and maintenance responsibilities within the ROW, as well as the limits of any Additional Properties to be acquired for the Project. This Plan will serve as the boundary for construction Work and will also be used as the exact limits for the DB Team to maintain any Element required to construct the Project beginning at the time of NTP 3 through Final Acceptance. The DB Team shall be responsible for all maintenance activities, in accordance with the GDOT Standard Specifications, Construction of Transportation Systems, within these limits that is impacted due to the construction activity of the DB Team, including:

1. Pavement maintenance, including pothole patching, concrete patching, striping, etc.
2. Existing ITS system and Drainage System continuity
3. Landscaping repair
4. Utility Adjustments
5. Existing lighting system
The DB Team shall provide the final Construction Maintenance Limits Plan no later than one hundred and fifty (150) days after NTP 1. If the Project is broken into separate construction phases, the DB Team shall provide and obtain approval of the final Construction Maintenance Limits Plan prior to the start of construction of that phase. The Plan shall show hash marks or a method to clearly depict the area of the construction maintenance limits. The DB Team is required to depict in the Construction Maintenance Limits Plan any and all proposed staging and lay-down areas. All staging and lay-down areas must have prior approval by GDOT.

Notwithstanding GDOT’s approval of the Construction Maintenance Limits Plan, the DB Team shall be responsible for any and all maintenance for any area(s) encroached on by the DB Team during the performance of the construction Work. See Section 2 for additional requirements.

19.3 Maintenance Management Plan

In conjunction with the Construction Maintenance Limits Plan, the DB Team shall prepare a Maintenance Management Plan that outlines the frequency of inspection and repair and/or maintenance of those items under the DB Team’s responsibility. The plan shall include, as a minimum, the following:

1. Pavement inspection and repair
2. Debris removal on the traveled way
3. Guardrail inspection and safety protections in place where guardrail has been damaged within 48 hours, and repair of damage within 7 days
4. Temporary striping restriping at no longer than 60-day intervals, or more frequently if required
20 BICYCLE AND PEDESTRIAN FACILITIES

20.1 General
This section includes requirements with which the DB Team shall design and construct all bicycle and pedestrian facilities for the Project, if required. The DB Team shall ensure the bicycle and pedestrian facilities of this Project support GDOT’s commitment to integrate bicycle and pedestrian travel into Project development. The DB Team shall coordinate the Elements of this Project with the existing and planned trails and other facilities of local and county administrations for pedestrians and cyclists. The DB team shall design all bicycle and pedestrian facilities according to the documents located in Attachment 3-1 Manuals.

20.1.1 Standards
The DB Team shall provide activities in this section in accordance with Attachment 3-1 Manuals, Government Approvals, and other provisions of the DB Documents.

20.2 Design Requirements

20.2.1 Bicycle Facilities
The DB Team’s bicycle facilities shall be consistent with State, regional, and local bicycle and pedestrian plans, and accommodate proposed and existing bicycle paths and crossings, and on-street bicycle facilities. The DB Team shall coordinate its design with Governmental Entities design to ensure consistency of use with existing and accommodating proposed bicycle facilities. Refer to GDOT Design Policy Manual, Chapter 9.

20.2.2 Pedestrian Facilities
The DB Team shall design, construct, and maintain sidewalks where sidewalks currently exist and where required by State or Federal regulations. Sidewalks shall comply with the Title II provisions of the Americans with Disabilities Act (ADA) Accessibility Standards. The DB Team shall install pedestrian signals and curb ramps at all existing and proposed signalized intersections. All pedestrian facilities shall be designed to incorporate ambulatory, visibility, and auditory needs of all users.

20.2.3 Final Plans
Consistent with the requirements of the DB Documents and all RIDs, the DB Team shall incorporate the following elements relating to bicycle and pedestrian facilities into the Preliminary and Final Plans:

1. Alignment, profile, cross-section, and materials
2. Points of connection to existing and proposed bicycle and pedestrian facilities, such as a connection to an existing or proposed multi-use trail, sidewalk, or bike lane on an adjacent facility

3. Signing, signalization, and pavement markings

4. Methods of illumination, where applicable

5. Requirements of the Landscape Enhancement Plan and Hardscape Enhancement Plan
21 RESERVED
22 RESERVED
Georgia Department of Transportation

Technical Provisions

For

Design-Build Agreement

P.I. No. 210327-

Attachment 3-1

MANUALS
Manuals

All Work shall conform with all applicable Manuals and Guidelines developed for and including AASHTO, FHWA, GDOT, and additional requirements stated in this document and reasonably inferred therefrom. It is the Design-Build Team's responsibility to verify order of the precedence of any State or Federal manual requirement where any potential conflict may exist. The Design-Build Team shall coordinate with the appropriate State and/or Federal agency to confirm the policy and regulations to avoid any conflict of the following manuals prior to design and/or construction. Following is a list of manuals and guidelines that shall be used in the performance of the Work provided that the Work shall not be governed solely by such manuals and guidelines listed herein, and provided further that it is the Design-Build Team's responsibility to locate and utilize the most current edition in effect at the date identified in Article 7.2.4 of Volume 1, including updates, of all such referenced materials for the Work required.

1. AASHTO – A Policy on Geometric Design of Highways and Streets
2. AASHTO – Guide for High-Occupancy Vehicle Facilities
   https://bookstore.transportation.org/Item_details.aspx?id=114
4. AASHTO – Roadside Design Guide
5. AASHTO – Roadway Lighting Design Guide
   https://bookstore.transportation.org/Item_details.aspx?id=51
10. AASHTO – AWS D1.1/ANSI Structural Welding Code – Steel
    http://www.techstreet.com/cgi-bin/detail?doc_no=AWS%7CD1_1_D1_1M_2008&product_id=1519645
11. AASHTO – D1.5/AWS D1.5 Bridge Welding Code
    http://www.techstreet.com/cgi-bin/detail?product_id=957255
   https://bookstore.transportation.org/Item_details.aspx?id=2707
14. Federal Highway Administration (FHWA) Roadway Construction Noise Model (RCNM) and
    Guideline Handbook
15. AISC Manual of Steel Construction, referred to as “AISC Specifications”
    America (IESNA) RP-14-8-Recommended Practice for Roadway Lighting
17. America Disabilities Act Accessibility Guidelines (ADAAG)
   http://www.ada.gov/stdspdf.htm
18. FHWA - Manual of Uniform Traffic Control Devices (MUTCD)
   http://mutcd.fhwa.dot.gov/
19. GDOT – Signing and Marking Design Guidelines
   http://www.dot.ga.gov/PS/Utilities
21. GDOT - Guidelines on Geotechnical Studies [including updates to LRFD requirements dated 1/31/2018 and 2/16/2018]
   http://www.dot.ga.gov/PS/Materials
22. GDOT – STI (Sampling, Testing and Inspection) Quick Guide and Documents
   http://www.dot.ga.gov/PS/Materials
23. GDOT – Qualified Products List (QPL)
   http://www.dot.ga.gov/PS/Materials/QPL
24. GDOT – Pavement Design Manual
   http://www.dot.ga.gov/PS/Materials
25. GDOT – Drainage Design for Highways [Revision 3.2 dated 2/9/2018]
27. GDOT – Regulations for Driveway and Encroachment Control
28. GDOT – Electronic Data Guidelines
   http://www.dot.ga.gov/PS/DesignManuals
29. GDOT – Plan Development Process
30. GDOT – Plan Presentation Guide
   http://www.dot.ga.gov/PS/DesignManuals
31. GDOT – Preliminary Field Plan Review Checklist
   http://www.dot.ga.gov/PS/DesignManuals/DesignResources
32. GDOT – Final Field Plan Review Checklist
   http://www.dot.ga.gov/PS/DesignManuals/DesignResources

33. GDOT – Design Policy Manual [Revision 5.3 dated 4/24/2018]

34. GDOT – ITS Design Manual

35. GDOT – NPDES General Permit Guidance

36. GDOT – MS4 Special Design Post-Construction Details
   http://www.dot.ga.gov/PartnerSmart/DesignManuals/NPDES/MS4 Special Design
   Details.zip

37. GDOT – Bridge and Structures Design Manual

38. GDOT – Environmental Procedures Manual
   http://www.dot.ga.gov/PS/DesignManuals/EnvironmentalProcedures

39. GDOT – Standard Specifications, Construction of Transportation Systems

    SharePoint Site

41. GDOT – Construction Standards and Details
    http://standarddetails.dot.ga.gov/stds_dtls/

42. GDOT – Right of Way Manual
df

43. GDOT – Acquisition Guide for Local Public Agencies
    http://www.dot.ga.gov/PartnerSmart/DesignManuals/ROW/ROW-
    AcquisitionGuideforLocalPublicAgenciesSponsors.pdf

44. GDOT – Statewide MS4 Permit
    http://epd.georgia.gov/sites/epd.georgia.gov/files/related_files/site_page/Final_DOT_SW_N
    PDES_Permit_MS4_Dec_2011.pdf

45. GDOT – Design of Post-Construction BMPs

46. Georgia Soil and Water Conservation Commission - Manual for Erosion and Sediment
    Control in Georgia
    http://gaswcc.georgia.gov/manuals

47. GDOT – Facilities Stormwater Pollution Prevention Plan


50. FHWA Diverging Diamond Interchange Informational Guide

51. FHWA Traffic Detector Handbook

52. FHWA Mitigation Strategies for Design Exceptions

53. FHWA Traffic Monitoring Guide

54. Occupational Safety and Health Administration Standards (OSHA)


56. U. S. Environmental Protection Agency Regulations
   http://www.epa.gov/lawsregs/

57. GDOT – Public Information Policy Manual
   http://www.dot.ga.gov/PartnerSmart/DesignManuals/Environmental/Public%20Involvement%20Plan/PublicInvolvementPlan.pdf

58. American Railway Engineering and Maintenance-of-Way Association (AREMA)
   https://www.arema.org/

59. GDOT – Work Zone Safety and Mobility Policy

60. GDOT – Quality Control and Quality Assurance Manual
   http://www.dot.ga.gov/PS/DesignManuals/DesignResources

61. Federal Railroad Administration Regulations
   http://www.fra.dot.gov

62. Public Project Information for Construction and Improvement Projects That May Involve the Railroad (CSX)

63. MUTCD – Standards Highway Signs and Markings

   http://www.georgiastormwater.com/

65. Georgia EPD – Coastal Stormwater Supplement to the Stormwater management Manual

66. GDOT – ITS Strategic Deployment Plan (Posted on SharePoint)

67. ITE/AASHTO Traffic Management Data Dictionary (TMDD), Standards for Traffic Management Center to Center Communications Version 2.1
68. AASHTO – A Policy on Design Standards Interstate System

69. Georgia Traffic Incident Management Guidelines

70. GDOT – Construction Manual and Form Documents
   http://www.dot.ga.gov/PartnerSmart/Business/Source/Pages/ConstructionSpecs.aspx

71. Other manuals, documents, procedures and standards as referenced in the DB Documents
DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

SPECIAL PROVISION

Section 105—Control of Work

105.01 Authority of the Engineer

The Engineer will decide all questions that may arise as to the quality and acceptability of materials furnished, work performed, and the rate of progress of The Work; the interpretation of the Plans and Specifications, and all questions as to the acceptable fulfillment of the Contract on the part of the Contractor. The Engineer will determine the quantities of the several kinds of work performed and materials furnished which are to be paid for under the Contract and his determination shall be final.

The Engineer will have the authority to suspend The Work wholly or in part due to the failure of the Contractor to correct conditions unsafe for the workmen or general public; for failure to carry out provisions of the Contract, or for failure to carry out orders; for such periods as he may deem necessary due to unsuitable weather; for conditions considered unsuitable for the prosecution of The Work; or for any other condition or reason deemed to be in the public interest.

The Contractor may request and will receive written instructions from the Engineer upon any important items.

After the Contract has been executed, and before work begins, the Engineer may designate a time and place to hold a Preconstruction Conference with the Contractor. At such time, the Contractor shall furnish the Engineer with a Progress Schedule as provided in Subsection 108.03 unless this schedule has been specifically exempted by Special Provision. The Contractor will also be given a decision on any alternate Traffic Control Plan that he may have previously submitted.

Any matters pertaining to order of work, interpretation of Plans and Specifications, traffic control, utility adjustments, or others, may be discussed at the Preconstruction Conference.

105.02 Plans and Working Drawings

Plans will show details of all structures, lines, grades, typical cross sections of the roadway, location and design of all structures, and a summary of items appearing in the Proposal.

The Plans will be supplemented by such working drawings as are necessary to adequately control the Work. Working drawings for structures shall be furnished by the Contractor and shall consist of such detailed Plans as may be required to adequately control The Work and which are not included in the Plans furnished by the Department. They shall include stress sheets, shop drawings, erection plans, falsework plans, cofferdam plans, bending diagrams for reinforcing steel or any other supplementary plans, or similar data required of the Contractor. All working drawings must be approved by the Engineer and such approval shall not operate to relieve the Contractor of any responsibility under the contract for the successful completion of The Work. The Contract Bid Prices shall include the cost of furnishing all working drawings.

105.03 Conformity with Plans and Specifications

All Work performed and all materials furnished shall be in reasonably close conformity with the lines, grades, cross sections, dimensions, and material requirements, including tolerances, shown on the Plans or indicated in the Specifications.

Plan dimensions and contract Specification values are to be considered as the target values to be strived for and complied with as the design values from which any deviations are allowed. It is the intent of the Specifications that the materials and workmanship shall be uniform in character and shall conform as nearly as realistically possible to the prescribed target value or to the middle portion of the tolerance range. The purpose of the tolerance range is to accommodate occasional minor variations from the median zone that are unavoidable for practical reasons. When either a maximum and minimum value or both are specified, the production and processing of the material and the performance of the work shall be so controlled that material or work will not be preponderantly of borderline quality or dimension.

In the event the Engineer finds the materials or the finished product in which the materials are used not within reasonably close conformity with the Plans and Specifications, but that reasonably acceptable work has been produced, the Engineer
Section 105—Control of Work

shall then make a determination if the work shall be accepted and remain in place. In this event, except in cases where the appropriate price adjustments are provided for in the Specifications covering the materials and/or the finished product, a Supplemental Agreement will be executed documenting the basis of acceptance that will provide for an appropriate price adjustment in the Contract Price for such work or materials as the Engineer deems necessary to conform to his determination based on engineering judgement.

In the event the Engineer finds the materials or the finished product in which the materials are used or the work performed are not in reasonably close conformity with the Plans and Specifications, and have resulted in an inferior or unsatisfactory product, the work or materials shall be removed and replaced or otherwise corrected by and at the expense of the Contractor.

105.04 Coordination of Plans, Specifications, Supplemental Specifications, and Special Provisions

These Standard Specifications, the Supplemental Specifications, the Plans, Special Provisions, and all supplementary documents are essential parts of the Contract, and a requirement occurring in one is as binding as though occurring in all. They are intended to be complementary and to describe and provide for a complete work.

In cases of discrepancy, the governing descending order will be as follows:

1. Project Specific Special Provisions
2. Project Plans including Special Plan Details
4. Supplemental Specifications
5. Standard Plans including Standard Construction Details
6. Standard Specifications

Calculated dimensions will govern over scaled dimensions.

The Contractor shall take no advantage of any apparent error or omission in the Plans or Specifications. In the event the Contractor discovers such an error or omission, he shall immediately notify the Engineer. The Engineer will then make such corrections and interpretations as may be deemed necessary for fulfilling the intent of the Plans and Specifications.

A. Specifications of Other Organizations

When work is specified to be done or when materials are to be furnished according to the published specifications of organizations other than the Department, the latest specifications published by those organizations at the time bids are received shall apply unless otherwise specified.

AASHTO Interim Specifications and ASTM Tentative Specifications will be considered effective on date of issue.

B. Item Numbers

The first three digits of any Item Number in the itemized Proposal designates the Specification section under which the Item shall be constructed.

105.05 Cooperation by Contractor

The Contractor will be supplied with an electronic copy of approved Plans and Contract assemblies including Special Provisions. The Contractor shall be responsible for maintaining one set of the approved plans on the project site at all times.

The Contractor will be supplied with of approved Plans and Contract assemblies including Special Provisions.

The Contractor shall give The Work the constant attention necessary to facilitate the progress thereof, and shall cooperate with the Engineer, Inspectors, and other Contractors in every way possible.

The Contractor shall have accessible to the Engineer at all times, as his agent, a competent Superintendent, capable of reading and thoroughly understanding the Plans and Specifications, and thoroughly experienced in the type of work being performed, who shall receive instructions from the Engineer or his authorized representatives. The Superintendent shall have full authority to execute orders or directions of the Engineer without delay and to promptly supply such materials, equipment, tools, labor, and incidentals as may be required. Such superintendence shall be furnished irrespective of the amount of work sublet.
Section 105—Control of Work

The Superintendent shall notify the Engineer prior to starting any Pay Item Work. The Prime Contractor shall coordinate and be responsible to the Engineer for all activities of subcontractors.

105.06 Cooperation with Utilities

The Department will notify all utility companies, all pipeline owners, all railroad companies, or other parties affected of Award of the Contract, giving the name and address of the Contractor, and will assist the Contractor in arranging for all necessary adjustments of the public or private utility fixtures, pipe lines, and other appurtenances within or adjacent to the limits of construction.

Water lines, gas lines, wire lines, service connections, water and gas meter boxes, water and gas valve boxes, light standards, cableways, signals, railroad facilities, and all other utility appurtenances within the limits of the proposed construction which are to be relocated or adjusted are to be moved by the owners at their expense, except as otherwise provided for elsewhere in the Contract.

It is understood and agreed that the Contractor has considered in his bid all of the permanent and temporary utility appurtenances in their present location or relocated positions, and that no additional compensation will be allowed for any delays, inconvenience, or damage sustained by him due to any interference from said utility appurtenances or the operation of moving them. Delays and interruptions to the controlling Item or Items of The Work are covered in Subsection 107.21.G.

It shall be the Contractor’s responsibility to plan with each utility owner a schedule of operations which will clearly set forth at which stage of the Contractor’s operations the utility owner will be required to perform his removal and relocation work.

105.07 Cooperation Between Contractors

The Department reserves the right at any time to Contract for and perform other or additional work on or near The Work covered by the Contract.

When separate Contracts are let within the limits of any one Project, each contractor shall conduct his work so as not to interfere with or hinder the progress or completion of The Work being performed by other Contractors. Contractors working on the same Project shall cooperate with each other.

Each Contractor involved shall assume all liability, financial or otherwise, in connection with his Contract and shall protect and save harmless the Department from any and all damages or claims that may arise because of inconvenience, delay, or loss experienced by him because of the presence and operations of other Contractors working within the limits of the same Project.

The Contractor shall arrange his work and shall place and dispose of the materials being used so as not to interfere with the operations of the other contractors within the limits of the same Project. He shall join his work with that of the others in an acceptable manner and shall perform it in proper sequence to that of the others. At the request of the Structure Contractor, the Engineer will designate an area within the right-of-way, adjacent to each structure, to be reserved for use by the Structure Contractor for Storage of Equipment and Materials necessary to construct the particular structure. So long as he occupies this area, the Structure Contractor shall be responsible for its maintenance. The Structure Contractor must relinquish this area, however, as it becomes practical to utilize completed portions of the structure.

105.08 Construction Stakes, Lines and Grades

(Subsection 105.08 Omitted)

105.09 Authority and Duties of the Resident Engineer

The Resident Engineer, regardless of his administrative title, is the Engineer designated by the Department to be the direct representative of the Chief Engineer. The Resident Engineer has immediate charge of the engineering details of each construction Project, and is responsible for contract administration. Such administration includes the designation of subordinates to represent him and make routine decisions. The Resident Engineer has the authority to reject defective material and to suspend any work that is being improperly performed.

105.10 Duties of the Inspector

Inspectors employed by the Department are authorized to inspect all work done and materials furnished. Such inspection may extend to all or any part of The Work and to the preparation, fabrication, or manufacture of the materials to be used. The Inspector will not be authorized to alter or waive the provisions of the Contract. The Inspector will not be authorized to issue instructions contrary to the Plans and Specifications or to act as foreman for the Contractor.
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105.11 Inspection of the Work

All materials and each part of the detail of The Work shall be subject to inspection by the Engineer.

The Engineer shall be allowed access to all parts of The Work and shall be furnished with such information and assistance by the Contractor as is required to make a complete and detailed inspection.

Upon the Engineer’s request, the Contractor, at any time before Final Acceptance of the project, shall remove or uncover such portions of the finished work as may be directed. After examination, the Contractor shall restore said portions of The Work to the standard required by the Specifications. Should The Work thus exposed or examined prove acceptable, the uncovering or removing and the replacing of the covering or making good of the parts removed will be paid for as Extra Work; but should the work so exposed or examined prove unacceptable, the uncovering, or removing and the replacing of the covering or making good of the parts removed will be at the Contractor’s expense.

Any work done or materials used without supervision or inspection by an authorized Department representative may be ordered removed and replaced at the Contractor’s expense, unless the Department representative failed to inspect after having been given reasonable notice in writing that The Work was to be performed.

When any unit of government or political subdivision or any railroad corporation is to pay a portion of the cost of The Work covered by the Contract, its respective representatives shall have the right to inspect The Work. Such inspection shall in no sense make any unit of government or political subdivision or any railroad corporation a party to the Contract and shall in no way interfere with the rights of either party hereunder.

105.12 Removal of Unacceptable and Unauthorized Work

All work that does not conform to the requirements of the Contract will be considered unacceptable unless otherwise determined acceptable under the provisions in Subsection 105.03.

Unacceptable work, whether the result of poor workmanship, use of defective materials, damage through carelessness, or any other cause found to exist prior to the Final Acceptance of The Work, shall be removed immediately and replaced in an acceptable manner.

Except as elsewhere noted, no work shall be done without lines and grades having been given by the Engineer. Work done contrary to the instructions of the Engineer, work done beyond the lines shown on the Plans or as given, except as herein specified, or any Extra Work done without authority will be considered as unauthorized and will not be paid for under the provisions of the Contract. Work so done may be ordered removed or replaced at the Contractor’s expense.

Upon failure on the part of the Contractor to comply forthwith with any order of the Engineer made under the provisions of this section, the Engineer will have authority to cause unacceptable work to be remedied or removed and replaced and to cause unauthorized work to be removed, and to deduct the costs from any monies due or to become due the Contractor.

105.13 Claims for Adjustments and Disputes

Whenever the Contractor believes that it is or will be entitled to additional compensation, whether due to delay, extra work, breach of contract, or other causes, the Contractor shall follow the procedures set forth in this Sub-Section.

A. Claims For Acceleration

The Department shall have no liability for any constructive acceleration. If the Department gives express written direction for the Contractor to accelerate its effort, then both parties shall execute a Supplemental Agreement as provided in Subsection 104.03.

B. Claims For Delay and All Other Claims Except Acceleration

1. The Department shall have no liability for damages beyond those items which are specifically payable under this Sub-Section.

2. The Department will be liable only for those delay damages caused by or arising from acts or omissions on the part of the Department which violate legal or contractual duties owed to the Contractor by the Department. The Contractor assumes the risk of damages from all other causes of delay.
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3. The parties recognize that delays caused by or arising from right of way problems, defects in plans or design, redesign, changes in The Work by the Department, the actions of suppliers or other Contractors, the shop-drawing approval process, injunctions, court orders and other such events, forces or factors are commonly experienced in highway construction work. Such delays shall not constitute breaches of the Contract. However, such delays may constitute a basis for a claim for delay damages, if found to be in accordance with Subsection 105.13.B.2 above and other provisions of the Contract, and/or a request for a time extension.

4. The term "delay" shall be deemed to mean any event, action, force or factor which extends the Contractor's time of performance. This Subsection is intended to cover all such events, actions, forces or factors, whether they be styled "delay," "disruption," "interference," "impedance," "hindrance", "impact" or otherwise.

5. Compliance with the provisions of Subsection 105.13 will be an essential condition precedent to any recovery of damages by the Contractor.

6. The following items, and only the following items, may be recoverable by the Contractor as "damages:
   a. Additional direct hourly rates paid to employees for job site labor, including payroll taxes, welfare, insurance, benefits and all other labor burdens.
   b. Documented additional costs for materials.
   c. Additional equipment costs, as determined in accordance with this Sub-Section.
   d. Documented costs of extended job-site overhead. (Not applicable for claims other than delay claims.)
   e. An additional 15 percent of the total of Subsections 105.13.B.6. a, b, c and d, which sum includes home office overhead and profit.
   f. Bond costs.
   g. Subcontractor costs, as determined by, and limited to, those items identified as payable under Subsection 105.13.B.6. a, b, c, d, e, and f.

7. For purposes of computing additional equipment costs, rates used shall be based on the Contractor's actual experienced cost for each piece of equipment. These rates shall be supported by equipment cost records furnished by the Contractor. In no case will equipment rates be allowed in excess of 70% of those determined utilizing the "Rental Rate Blue Book," with the appropriate adjustments noted in Subsection 105.05.

8. The parties agree that, in any claim for damages, the Department will have no liability for the following items of damages or expense:
   a. Profit, in excess of that provided herein.
   b. Loss of profit.
   d. Home office overhead in excess of that provided herein.
   e. Consequential damages, including but not limited to loss of bonding capacity, loss of bidding opportunities and insolvency.
   f. Indirect costs or expenses of any nature.
   g. Attorneys fees, claims preparation expenses, or costs of litigation.
   h. Interest of any nature.

9. NOTICE OF POTENTIAL CLAIM: In any case in which the Contractor believes that it will be entitled to additional compensation, the Contractor shall notify the Engineer in writing of its intent to claim such additional compensation. Such notice shall be given in order that the Department can assess the situation, make an initial determination as to who is responsible, and institute appropriate changes or procedures to resolve the matter.
   a. Claims for Delay - The Department shall have no liability for any delay which occurred more than one week prior to the filing of such written notice. Failure of the Contractor to give such written notice in a timely fashion will be grounds for denial of the claim.
   b. All Other Claims Except Acceleration and Delay - If the Contractor does not file such written notice before beginning the work out of which such claim arises, then the Contractor hereby agrees that it shall have waived any additional compensation for that work and the Contractor shall have no claim thereto.
Section 105—Control of Work

10. RECORDS: After filing a "Notice of Potential Claim", the Contractor shall keep daily records of all labor, material, and equipment costs incurred for operations affected. These daily records shall identify each operation affected and the specific locations where work is affected. The Department will also keep records of all labor, material, and equipment used on operations affected. At the time and place, as designated by the Engineer, on Monday, or the first work day, of each week following the date of filing a "Notice of Potential Claim", the Contractor shall meet with the Department's representative and present the daily records for the preceding week. If the Contractor's records indicate costs greater than those kept by the Department, the Department will present its records to the Contractor. The Contractor shall notify the Engineer in writing within three (3) work days of any inaccuracies noted in, or disagreements with, the Department's records. Refusal or repeated failure by the Contractor to attend these weekly meetings and present its records will constitute a waiver by the Contractor of any objections as to the accuracy of the Department's records. When the Contractor makes an objection as to the accuracy of the Department's records, the Engineer shall review the matter, and correct any inaccuracies he finds in the Department's records. For purposes of computing damages, the Department's records will control.

In the event the Contractor wishes to contest the accuracy of the Department's records, it may file a petition pursuant to Rule 672-1-.05 of the Official Rules and Regulations of the Department of Transportation. The decision of the Engineer, or, if contested, the decision of the Agency, will be final and binding upon the parties as to any objections to the accuracy of the Department's records, subject to the Contractor's right to judicial review under O.C.G.A. Section 50-13-19.

11. On a weekly basis after filing a "Notice of Potential Claim" for delay damages, the Contractor shall prepare and submit to the Engineer written reports providing the following information:
   a. Potential effect to the schedule caused by the delay.
   b. Identification of all operations that have been delayed, or are to be delayed.
   c. Explanation of how the Department's act or omission delayed each operation, and estimation of how much time is required to complete the project.
   d. Itemization of all extra costs being incurred, including:
      1) An explanation as to how those extra costs relate to the delay and how they are being calculated and measured.
      2) Identification of all project employees for whom costs are being compiled.
      3) Identification of all manufacturer's numbers of all items of equipment for which costs are being compiled.

C. Required Contents of Claims

All claims shall be submitted in writing, and shall be sufficient in detail to enable the Engineer to ascertain the basis and the amount of each claim. The claim submission shall include six (6) printed copies and one (1) digital copy on Recordable disk. All information submitted to the Department under this Subsection will be used exclusively for analyzing the claim, resolving the claim or any litigation which might arise from the claim. At a minimum, the following information shall be provided:

1. A description of the operations that were delayed, the reasons for the delay, how they were delayed, including the report of all scheduling experts or other consultants, if any. (Not applicable for claims other than delay claims)
2. An as-built chart, CPM scheme or other diagram depicting in graphic form how the operations were adversely affected. (Not applicable for claims other than delay claims except where an extension of time is sought)
3. A detailed factual statement of the claim providing all necessary dates, locations and items of work affected by the claim.
4. The date on which actions resulting in the claim occurred or conditions resulting in the claim became evident.
5. A copy of the "Notice of Potential Claim" filed for the specific claim by the Contractor.
6. The name, function, and activity of each Department official, or employee, involved in, or knowledgeable about facts that gave rise to such claim.
7. The name, function, and activity of each Contractor or Subcontractor official, or employee, involved in, or knowledgeable about facts that gave rise to such claim.
8. The identification of any pertinent documents, and the substance of any material oral communication relating to such claim.
9. A statement as to whether the additional compensation or extension of time sought is based on the provisions of the Contract or an alleged breach of Contract.
10. The specific provisions of the Contract which support the claim, and a statement of the reasons why such provisions support the claim.
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11. The amount of additional compensation sought and a break-down of that amount into the categories specified as payable under Subsection 105.13.B.6, above.

12. If an extension of time is also sought, the specific days for which it is sought and the basis for such request.

D. Required Certification of Claims

When submitting the claim, the Contractor shall certify in writing, under oath in accordance with the formalities required by Georgia law, as to the following:

1. That the claim is made in good faith.
2. That supportive data are accurate and complete to the Contractor's best knowledge and belief that the amount of the claim accurately reflects what the Contractor in good faith believes to be the Department's liability.

The Contractor shall use the CERTIFICATE OF CLAIM form, which can be obtained from the Department, in complying with these requirements.

E. Auditing of Claims

All claims filed against the Department shall be subject to audit at any time following the filing of such claim, whether or not such claim is part of a suit pending in the courts of this State. The audit may be performed by employees of the Department or by an independent auditor on behalf of the Department. The audit may begin on ten days notice to the Contractor, Subcontractor, or Supplier. The Contractor, Subcontractor, or Supplier shall make a good faith effort to cooperate with the auditors. Failure to cooperate with the auditor shall constitute a waiver by the Contractor of the claim in its entirety. Failure of the Contractor, Subcontractor, or Supplier to maintain and retain sufficient records to allow the Department's auditor to verify the claim shall constitute a waiver of that portion of such claim that cannot be verified and shall bar recovery thereunder. If the claim is part of a suit pending in a court of this state or if the claim becomes a part of a suit in a court of this state, the questions of whether the Contractor has cooperated with the auditor or failed to maintain and retain sufficient records to allow the auditor to verify the claim shall be questions for determination by the judge without the assistance of a jury.

Without limiting the generality of the foregoing, and as a minimum, the auditors shall have available to them the following documents:

1. Daily time sheets and foreman's daily reports.
2. Project payroll register.
3. Profit and loss statements for the Project.
4. Payroll tax returns.
5. Material invoices, purchase orders, and all material and supply acquisition contracts for the Project.
6. Material cost distribution worksheet for the Project.
7. Equipment records (list of company equipment, rates, etc.)
8. Vendor rental agreements, and subcontractor invoices.
9. Material invoices, purchase orders, and all material and supply acquisition contracts for the Project.
10. Canceled checks (payroll and vendors) for the Project.
12. Job payroll ledger for the Project.
13. General ledger, general journal, (if used) and all subsidiary ledgers and journals together with all supporting documentation pertinent to entries made in these ledgers and journals.
15. Certified financial statements for all years reflecting the operations on this project.
16. Depreciation records on all company equipment whether such records are maintained by the company involved, its accountant, or others.
17. If a source other than depreciation records is used to develop costs for the Contractor's internal purposes in establishing the actual cost of owning and operating equipment, all such other source documents.
18. All documents which relate to each and every claim together with all documents which support the amount of damages as to each claim.
19. Worksheets used to prepare the claim establishing the cost components for items of the claim including, but not limited to, labor, benefits and insurance, materials, equipment, subcontractors, and all documents which establish the time periods, individuals involved, the hours and the rates for the individuals.
Section 105—Control of Work

F. Mediation

After compliance by the Contractor with parts B., C., D. and E. of Subsection 105.13 and if the Contractor's claim has been disallowed in whole or in part, then the Contractor may, within 30 calendar days from receipt of the ruling of the Engineer, make a written request to the Engineer that the claim or claims be referred to mediation.

If requested in accordance with this specification, mediation shall be granted by the Department. In which case, within 30 days of receipt by the Department of the Contractor's request for mediation, the Contractor and the Department will meet to select a mediator. The mediator will then schedule the mediation at a place, time, and earliest date agreeable to the Contractor and the Department.

The Contractor and the Department mutually agree that mediation shall be a condition precedent to the filing of any lawsuit concerning claims or alleged breaches of the Contract. The costs and expenses of the mediator, selected by mutual agreement of the parties, will be divided equally between the Department and the Contractor. Each party to the mediation shall bear its own costs of preparing for and participating in the mediation.

G. Remedies Exclusive

In the event any legal action is instituted against the Department by the Contractor on account of any claim for additional compensation, whether on account of delay, acceleration, breach of contract, claimed extra work, or otherwise, the Contractor agrees that the Department's liability will be limited to those items which are specifically identified as payable in Sub-Section 105.13.

105.14 Maintenance During Construction

The Contractor shall maintain the project during construction and until the Project is accepted. This maintenance shall constitute the continuous and effective work prosecuted day by day, with adequate equipment and forces to the end that all areas of the project are kept in satisfactory condition at all times.

The Contractor's area of responsibility for maintenance is confined to the physical construction limits plus any areas affected by the Contractor's activities. Once maintenance acceptance or final acceptance has been made, the Contractor is no longer responsible for damage to The Work other than that attributable to the Contractor's actions or inadequate construction.

In case of separate contracts, each Contractor shall be responsible for any damage to the completed work of others caused by his actions or negligence. Where the work of one Contractor has been accepted by the Department, the Contractor performing subsequent work in the area shall be responsible for the maintenance and protection of all work previously completed.

If separate bridge contracts are let within the limits of a Roadway Project and the Bridge Contractor completes his Contract before the Roadway Contractor, the Bridge Contract may be accepted and the Roadway Contractor will be responsible for maintenance of the new bridge until it is opened to traffic. If the Roadway Contractor hauls materials across the bridge the Roadway Contractor shall protect the endposts, deck surface, deck edges, joints, and all other vulnerable features of the bridge by use of adequate timber or earth cushions as directed by the Engineer. The Roadway Contractor shall repair all damage caused by such use, including resealing of joints and rerubbing of finish at his own expense.

All cost of maintenance work during construction and before the Project is accepted shall be included in the Unit Prices Bid on the various Pay Items and the Contractor will not be paid an additional amount for such work except as provided in Subsection 104.05.B.

The Contractor shall not allow vegetative growth at any time to obstruct signs, delineation, traffic movements, or sight distance. The Contractor shall at intervals not to exceed six months, clean up and remove litter and debris; remove weeds from around guardrail, barrier, poles, standards, utility facilities, and other structures; and cut or trim trees, bushes or tall grass. These requirements shall apply to all areas within the project termini and lateral limits.

105.15 Failure to Maintain Roadway or Structures

If at any time, the Contractor fails to comply with the provisions of Subsection 105.14, the Engineer will immediately notify the Contractor of such noncompliance. If the Contractor fails to remedy the unsatisfactory maintenance within 48 hours after receipt of such notice, the Engineer may immediately proceed to maintain The Work, and the entire cost of this maintenance will be deducted from monies due or to become due the Contractor under the Contract. As an alternative to the Engineer's maintaining the Work, all the Items and quantities of work done, but not properly maintained, may be deducted from the current progress estimate, even if such Items have been paid for in a previous estimate.


Section 105—Control of Work

105.16 Final Inspection and Acceptance

A. Corrective list

Excluding resurfacing projects, no less than 60 (Sixty) calendar days prior to the Contract Completion Date the Engineer will hold a Closing Conference and perform an inspection of the Work. Any items found unsatisfactory during this inspection will be detailed as necessary remedial work and provided to the Contractor in the form of a Corrective list. A Corrective list is intended to facilitate timely completion of the Work. Resurfacing projects necessitate the Engineer commence a Closing Conference and inspection no less than 14 calendar days to the Contract Completion Date unless otherwise arranged and agreed to by the Contractor.

The Contractor is encouraged to request additional inspections earlier in the Project as major portions of the work appear complete.

Production of a Corrective list does not, in any way, represent a Final Inspection having been performed.

B. Final Inspection

Upon receipt of due written notice from the Contractor of completion of the entire Project, the Engineer will schedule and make an inspection for Acceptance within 7 business days. No time charges shall be applied to the Contractor for the Engineer’s inability to meet the 7 business day allowance. If all construction provided for and contemplated by the Contract is found completed to the Engineer’s satisfaction and all documents required in connection with the Project have been submitted by the Contractor, the Engineer will consider this the Final Inspection. The Engineer will subsequently make the Final Acceptance and notify the Contractor in writing of this acceptance. The Engineer will have the final decision on when the Project is complete.

If, however, the Inspection discloses any work, in whole or part, as being unsatisfactory, the Engineer will detail the remedial work required to achieve acceptance and provide the Contractor the necessary instructions for correction of same. Only one list of instructions will be generated by the Engineer. The Contractor shall immediately comply with and execute such instructions. Subsequent inspections will be made on the remedial work until the Engineer accepts all Work. Such subsequent inspections are only for the purpose of assessing completion of the instructions provided. When all construction provided for and contemplated by the Contract is found completed to the Engineer’s satisfaction, including submission of all documents required in connection with the Project, the Engineer will make the Final Acceptance and notify the Contractor in writing of this acceptance.

When the Contractor has finished a major portion of the Contract, the Contractor may request that a semi-final inspection be made. At the discretion of the Engineer, who shall be sole judge as to making the inspection, if the work is satisfactory, as described in the first paragraph of this Section, that portion of the Contract may be accepted, opened to traffic, if not already carrying traffic, and the Contractor relieved of the maintenance obligations as described elsewhere in these Specifications.

Such partial acceptance shall in no way relieve the Contractor of responsibility for satisfactory completion of the Contract, or for failure of any portion of the accepted work prior to Final Acceptance of the Project.
Georgia Department of Transportation

Technical Provisions

For

Design-Build Agreement

P.I. No. 210327-

Attachment 6-1

UTILITY FACILITY RELOCATION ACCEPTANCE FORM TEMPLATE
Utility Facility Relocation Acceptance Form

Project PI Number:
Project Number:
County(ies):
Project Description:
Utility Owner Name: ____________________________

Type of Utility Facilities Installed by Contractor: ____________________________

Type of Relocation Work Described Herein (Circle One): Initial Relocation or Revised Relocation

Station Limits: ____________________________

General Description of Utility Facilities Installed by Contractor: ____________________________

Utility Work Completion Date: ____________________________

This Utility Facility Relocation Acceptance Form shall be completed by the Contractor’s Worksite Utility Coordination Supervisor (WUCS). It shall also be signed by an authorized representative of the Utility Owner and by the GDOT Project Manager upon completion and acceptance of the work described herein.

Execution of this Utility Facility Relocation Acceptance Form by the parties below provides acknowledgement that the work described above, has been visually inspected and accepted by the Utility Owner as to having been constructed in accordance with the Utility Owner approved relocation design plans and their current specifications and the requirements of the Memorandum of Understanding (MOU) as executed by the Utility Owner. Further, the Contractor’s WUCS shall provide the Utility Owner with a complete set of “As-Built Plans” for review and approval reflecting the relocation work performed by the Contractor as outlined in the Contract Specifications. Upon completion of this form and the exchange of the final Utility Owner approved “As-Built Plans”, all parties agree the Utility Owner will operate and maintain the installed facilities covered by this document going forward based on the date of execution by the GDOT Project Manager (PM). However, any items inadvertently overlooked and as identified in a subsequent utility punch list shall still be the responsibility of the Contractor to correct and provide up to date “As-Built Plans” to the Utility Owner.

Acceptance of this form by the Department does not confer legitimacy and accuracy or in any way transfers liability for errors or omissions made by the preparer.

Contractor’s WUCS:

Printed Name: ____________________________ Date: ____________________________
Signature: ________________________________  Title: ________________

Utility Owner Representative:
Printed Name: ________________________________  Date: ________________

Signature: ________________________________  Title: ________________

GDOT Project Manager:
Printed Name: ________________________________  Date: ________________

Signature: ________________________________  Title: ________________
Georgia Department of Transportation

Technical Provisions

For

Design-Build Agreement

P.I. No. 210327-

Attachment 6-2

SS 107 - LEGAL REGULATIONS AND RESPONSIBILITY TO THE PUBLIC
DEPARTMENT OF
TRANSPORTATION STATE OF
GEORGIA
SUPPLEMENTAL SPECIFICATION

Section 107 – Legal Regulations and Responsibility to the Public

Delete Section 107 and Substitute the following:

107.01 Laws to Be Observed
The Contractor shall keep fully informed of all Federal and State laws, all local laws, ordinances, codes, and regulations and all orders and decrees of bodies or tribunals having any jurisdiction or authority, which in any manner affect those engaged or employed on The Work, or which in any way affect the conduct of The Work. The Contractor shall at all times observe and comply with all such laws, ordinances, codes, regulations, orders, decrees, and permits; and shall protect and indemnify the Department and its representatives against any claim or liability arising from or based on the violation of any such law, ordinance, code, regulation, order, decrees, and permits, whether by himself, his employees, subcontractors, or agents.

107.02 Permits and Licenses
The Contractor shall procure all permits and licenses, pay all charges, taxes, and fees, and give all notices necessary and incidental to the due and lawful prosecution of The Work.

107.03 Patented Devices
If the Contractor employs any design, device, material, or process covered by letters of patent or copyright, he shall provide for such use by suitable legal agreement with the patentee or owner. The Contractor and the Surety shall indemnify and save harmless the Department from any and all claims for infringement by reason of the use of any such patented design, device, material, or process, or any trademark or copyright, and shall indemnify the Department for any costs, expenses, and damages which it may be obliged to pay by reason of any infringement, at any time during the prosecution or after the completion of The Work.

107.04 Restoration of Surfaces Opened By Permit
The right to construct or reconstruct any utility service in the highway or street and to grant permits for the same at any time, is expressly reserved by the Department for the proper authorities of the municipality or county in which The Work is done and the Contractor shall not be entitled to any damages either for the digging up of the street or highway, or for any delay occasioned thereby.

Any individual, firm, or corporation wishing to make an opening in the street or highway must secure a permit from the Department. The Contractor shall allow parties bearing such permits, and only those parties, to make openings in the street or highway. When ordered by the Engineer, the Contractor shall make in an acceptable manner all necessary repairs due to such openings and such necessary work will be paid for as Extra Work, or as provided in the Specifications, and will be subject to the same conditions as original work performed.

107.05 Federal-Aid Provisions
When the United States Government pays all or any part of the cost of a project, the Federal laws and the rules and regulations made pursuant to such laws must be observed by the Contractor, and The Work shall be subject to the
inspection of the appropriate Federal agency. Such inspection shall in no sense make the Federal Government a party to this Contract and will in no way interfere with the rights of either party hereunder.

107.06 Sanitary Provisions
The Contractor shall provide and maintain in a neat, sanitary condition such accommodations for the use of his employees as may be necessary to comply with the requirements of the State Department of Health and other authorities having jurisdiction, and shall permit no public nuisance.

107.07 Public Convenience and Safety
The Contractor shall at all times so conduct The Work as to assure the least possible obstruction of traffic. The safety and convenience of the general public and the residents along the highway and the protection of persons and property shall be provided for by the Contractor as specified under Subsection 104.05, Subsection 107.09, Section 150, the Project Plans, and Special Provisions.

Traffic whose origin and destination is within the limits of the Project shall be provided ingress and egress at all times unless otherwise specified in the Plans or Special Provisions. The ingress and egress includes entrance and exit via driveways at the various properties, and access to the intersecting roads and streets. The Contractor shall maintain sufficient personnel and equipment on the project at all times, particularly during inclement weather, to ensure that ingress and egress are provided when and where needed.

Two-way traffic shall be maintained at all times unless otherwise specified or approved. The Contractor shall not stop traffic without permission granted by the Engineer.

All equipment used on The Work shall come equipped with factory-installed mufflers, or manufacturer’s recommended equivalent, in good condition. These mufflers shall be maintained in good condition throughout the construction period.

107.08 Railroad-Highway Provisions
All work to be performed by the Contractor on a railroad company’s right-of-way or property shall be done in a manner satisfactory to the chief engineer of the railroad company, or his authorized representative, and shall be performed at such times and in such manner as not to unnecessarily interfere with the movement of trains or traffic upon the track of the railroad company. The Contractor shall use all reasonable care and precaution in order to avoid accidents, damage, or unnecessary delay or interference with the railroad company’s trains or other property, or property of tenants of railroad company.

The Contractor shall notify the railroad company and obtain its approval before commencing work on the railroad company’s right-of-way or property.

The Contractor shall determine what measures are required by the railroad company to protect its operations and right-of-way or property during construction. Such protection may include the use of a flagger or flaggers provided by the railroad company. The Contractor shall be responsible for ensuring that the required protection is provided and shall pay the railroad company directly for any and all such services which may be required to accomplish the construction unless otherwise specified.

Any temporary grade crossings or other means needed during construction by the Contractor for transporting materials of any nature and/or equipment across the railroad tracks will be the responsibility of the Contractor to handle directly with the railroad company and bear all costs incidental to such crossings including flagging services provided by the railroad company.

A “Special Provisions for the Protection of Railroad Interests” may be included in the proposal to stipulate insurance and other requirements of the railroad company.

107.09 Barricades and Danger, Warning, and Detour Signs
The Contractor shall furnish, install, and maintain all necessary and required barricades, signs, and other traffic control devices in accordance with these Specifications, Project Plans, Special Provisions, and the MUTCD, and take all necessary precautions for the protection of the work and safety of the public.

Unless otherwise specified, all traffic control devices furnished by the Contractor shall remain the property of the Contractor.
107.10 Forest Protection

In carrying out work within or adjacent to State or National Forests, or any other forests, parks, or other public or private lands, the Contractor shall obtain necessary permits and comply with all of the regulations of the appropriate authorities having jurisdiction over such forest, park, or lands. The Contractor shall keep the areas in an orderly condition, dispose of all refuse, obtain permits for the construction and maintenance of all construction camps, stores, warehouses, residences, latrines, cesspools, septic tanks, and other structures in accordance with the requirements of the appropriate authority.

The Contractor shall take all reasonable precautions to prevent and suppress forest fires and shall require his employees and subcontractors, both independently and at the request of forest officials, to do all reasonably within their power to prevent and suppress and to assist in preventing and suppressing forest fires; to notify a forest official at the earliest possible moment of the location and extent of any fire seen by them; and to extinguish or aid in extinguishing nearby fires.

107.11 Construction Over or Adjacent to Navigable Waters

A. Navigation to Be Protected

Since navigable waterways are under the jurisdiction of the United States Coast Guard and/or the United States Army Corps of Engineers, all work done in, over, on or adjacent to such waters shall comply with their requirements. Free navigation shall not be impeded, and navigable depths shall be maintained.

The Contractor shall comply with permits issued by the United States Coast Guard and/or the United States Army Corps of Engineers, and the Contractor shall obtain and comply with other permits in accordance with the requirements of Subsection 107.02

Special Provisions for environmental protection may be included in the proposal to stipulate environmental commitments and other requirements.

B. Obstructions to be Removed

When the construction has progressed enough to permit removal, all falsework, piling and other obstructions shall be removed to the satisfaction of the Federal agency having jurisdiction. In all cases such clearing must be done thoroughly before The Work will be accepted by the Department.

107.12 Use of Explosives

When the use of explosives is necessary for the prosecution of The Work, the Contractor shall exercise the utmost care not to endanger life or property, and shall obey all State, Federal and other Governmental regulations applying to transportation, storage, use, and control of such explosives. The Contractor shall be completely responsible for any and all damage resulting from the transportation, storage, use, and control of explosives in the prosecution of The Work by the Contractor, the Contractor’s agents, or employees; and shall hold the Department harmless from all claims of damages resulting in any manner therefrom.

The Contractor shall notify each public utility owner having structures or other installations, above or below ground, near the site of The Work of his intention to use explosives. Such notice shall be given sufficiently in advance to enable the utility owners to take such steps as they may deem necessary to protect their property from injury. Such notice shall not relieve the Contractor of responsibility for all damages resulting from his blasting operations.

All explosives shall be stored securely in compliance with all laws and ordinances, and all such storage places shall be clearly marked DANGEROUS EXPLOSIVES. Explosives and detonators shall be stored in separate storage facilities in separate areas. Where no laws or ordinances apply, locked storage shall be provided satisfactory to the Engineer, never closer than 1,000 ft (300 m) from any travel-road, building, or camping area.

In all cases where the transport, storage, or use of explosives is undertaken, such activities shall be controlled and directed by fully qualified representatives of the Contractor.

Whenever electric detonators are used, all radio transmitters shall be turned off within a radius of 500 ft (150 m). No blasting supplies shall be transported in vehicles with two-way radio unless the transmitter is turned off, or extra shielding precautions are taken. Appropriate signs shall be placed so as to give ample warning to anyone driving a vehicle equipped with two-way radio. Electrical detonators will not be used within 500 ft (150 m) of a railroad.
Submit a blasting plan to the Engineer a minimum of five working days prior to use of explosives that provides details of the proposed blasting plan, including, but not limited to, the type and amount of explosives, the shot sequence, the description of and distance to the closest inhabitable structure, and other information as requested by the Engineer. Submission of blasting plan does not relieve the contractor of the responsibility for the adequate and safe performance of the blasting.

107.13 Protection and Restoration of Property and Landscape

A. General Provisions

The Contractor shall be responsible for the preservation of all public and private property, crops, fish ponds, trees, monuments, highway signs and markers, fences, grassed and sodded areas, etc. along and adjacent to the highway, and shall use every precaution necessary to prevent damage or injury thereto, unless the removal, alteration, or destruction of such property is provided for under the Contract. The Contractor shall use suitable precaution to prevent damage to all underground structures, whether shown on the Plans or not, and shall protect carefully from disturbance or damage, all land monuments and property marks until the Engineer has witnessed or otherwise referenced their location and shall not move them until directed. The Contractor shall not willfully or maliciously injure or destroy trees or shrubs, and he shall not remove or cut them without proper authority.

The Contractor shall be responsible for all sheet piling, shoring, underpinning, etc., as may be required for the protection of abutting property, nearby buildings, streets, and the like.

The Contractor shall be responsible for all damage or injury to property of any character, during the prosecution of The Work, resulting from any act, omission, neglect, or misconduct in his manner or method of executing The Work, or at any time due to defective work or materials, and said responsibility will not be released until the Project shall have been completed and accepted.

When the Contractor’s excavating operations encounter remains of prehistoric people’s dwelling sites or artifacts of historical or archeological significance, the operations shall be temporarily discontinued. The Engineer will contact archeological authorities and the Office of Environmental Services to determine the disposition thereof. When directed by the Engineer, the Contractor shall excavate the site in such a manner as to preserve the artifacts encountered and shall remove them for delivery to the custody of the proper authorities. Such excavation will be considered and paid for as Extra Work.

When the Contractor’s normal operations are delayed by such stoppage or extra work, an appropriate time extension will be granted.

The Contractor shall plan, coordinate, and prosecute the work so that disruption to personal property and business is held to a practical minimum.

No resident or business shall be denied vehicular access to their property for any length of time other than as determined by the Engineer is absolutely necessary. Where two or more existing driveways are present for a business, only one existing driveway shall be closed at any time. All construction areas abutting lawns and yards of residential or commercial property shall be restored promptly. Backfilling of each drainage structure or section of curb and gutter, sidewalk, or driveway shall be accomplished as soon as adequate strength is obtained. Finishing, dressing, and grassing shall be accomplished immediately thereafter as a continuous operation within each area being constructed with emphasis placed on completing each individual yard or business frontage. Care shall be taken to provide positive drainage to avoid ponding or concentration of runoff.

Handwork, including raking and smoothing, shall be required to ensure that roots, sticks, rocks, and other debris are removed in order to provide a neat and pleasing appearance. Grassing, when in season, shall immediately follow in order to establish permanent cover at the earliest date. If grassing is not in season, proper erosion control shall be installed and maintained.

The work described above shall be in addition to that required by Subsection 104.07, “Final Cleaning Up” and Subsection 105.16, “Final Inspection and Acceptance”.


B. Erosion and Siltation Control

The Contractor shall take all necessary measures throughout the life of the Project to control erosion and silting of rivers, streams, and impoundments (lakes, reservoirs, etc.). Construction of drainage facilities as well as performance of other Contract work which will contribute to the control of erosion and siltation shall be carried out in conjunction with clearing and grubbing, and earthwork operations as stipulated in Section 161.

C. Pollution

The Contractor shall exercise every reasonable precaution throughout the life of the Contract to prevent pollution of rivers, streams or impoundments. Pollutants such as chemicals, fuels, lubricants, bitumens, raw sewage and other harmful waste shall not be discharged into or alongside rivers, streams, and impoundments, or into natural or manmade channels leading thereto. The Contractor shall also comply with the applicable regulations of other State and Federal departments and to all governmental statues relating to the prevention and abatement of pollution.

D. Insect Control Regulations

The Plant Pest Control Division of the U.S. Department of Agriculture and the Georgia State Department of Agriculture restrict the movement of certain items from areas infested with Japanese Beetles or Imported Fire Ants so as to prevent the spread of these pests to non-infested areas. Where insect infested areas are shown on the Plans, Contractors will control their operations in such a manner as to comply fully with the requirements of Section 155.

E. Reclamation of Material Pits and Waste Disposal Areas

Whenever or wherever the Contractor obtains material from a source or wastes material on an area other than within the Right-of-Way, regardless of the fashion, manner or circumstances for which the source or area is obtained, it shall be reclaimed in accordance with the requirements of Section 160.

F. Mailboxes

The property owner shall have the responsibility for removing and relocating the mailbox to an area outside construction limits.

The Engineer will mark a point for the relocation of the box. The stake should be set so that the location of the box will be convenient to both the mail carrier and the patron, yet not interfering with the proposed work. It may be necessary for the Engineer to confer with the Post Office serving the area.

The Contractor shall notify each affected owner, in writing, that their mailbox is in conflict with the proposed construction, that they have ten days to relocate the box and that, after the expiration of the 10 days’ notice, if the owner has not relocated the box, it shall be removed by the Contractor and laid upon the owner’s property, clear of the Right-of-Way.

Any cost to the Contractor for removing the mailboxes as stated above shall be included in the price bid for other items.

G. Failure to Comply

Failure of the Contractor to comply with any of the above provisions or to install erosion prevention items included in the Contract at the time specified, will be evidence of omission and neglect, and the Contractor will be liable for damages as outlined in Subsection 107.13.H below. Furthermore, the Engineer shall withhold payment on all Contract Items until such time as the Contractor complies in full with all of the aforesaid provisions.

H. Payment for Damages

When or where any direct or indirect damage or injury is done to public or private property by or on account of any act, omission, neglect, or misconduct in the execution of the Work, or in consequence of the nonexecution thereof by the Contractor, the Contractor shall restore, at his own expense, such property to a condition similar or equal to that existing before such damage or injury was done, by repairing, rebuilding or otherwise restoring as may be directed, or shall make good such damage or injury in an acceptable manner.
I. **Compensation**

All costs pertaining to any requirement contained herein shall be included in the overall Bid submitted unless such requirement is designated as a separate Pay Item in the Proposal.

### 107.14 Load Restrictions

It is hereby agreed between the Department and the Contractor that in the performance of The Work under the Contract, the following load restrictions and stipulations shall be in full force and effect during the life of the Contract:

**A. Parties Affected**

The load restrictions and stipulations contained herein shall be applicable to the equipment of the Contractor; each agent or subcontractor employed by the Contractor; and each person or persons, firm, partnership, corporation or any combination thereof, hauling materials, supplies or equipment to or on the Project, by or for the Contractor.

**B. Within Project Limits**

No hauling equipment which is loaded beyond those limits provided by State Law shall be permitted on any portion of the new or existing pavement structure except that such loads will be permitted on nonstabilized bases and subbases prior to placing roadway paving subject to the provisions of Subsection 107.17.

Axle loads and gross weight limits will be evaluated in accordance with current Georgia Law. All damage caused by any equipment to any permanent installation or portion of The Work shall be promptly repaired by the Contractor at his expense. When it becomes necessary to cross existing pavement with excessive loads, the Contractor shall provide and remove, at his own expense, proper cushioning by means of earth blanket or otherwise as directed.

**C. Outside Project Limits**

All equipment users included in Subsection 107.14.A, above, operating equipment on roads outside the Project limits shall be governed by the following regulations:

1. No vehicle shall carry any load in excess of that specified by Georgia Law.
2. On County System roads the maximum total gross weight shall not exceed 56,000 lbs. (25,400 kg) unless a vehicle is making a pickup or delivery on such roads.
3. For a specific individual trip the above weight limitations may be exceeded provided a special permit is obtained from the Department for each such movement. A special permit will not relieve the Contractor of liability for damage that may result from such a movement. Refer to O.C.G.A §32-6-26 Weight of Vehicle and Load, SB54 (2011) for compliance with weight limitations and exceptions.
4. Authorized personnel of the Department of Public Safety shall be permitted to weigh each truck hauling material to the Project whenever the Department so desires. The owner of each truck shall instruct his operators to cooperate with and assist the truck weighers in every way possible.
5. A Certified Public Weigher operating under the provisions of Standard Operating Procedure 15 shall not dispatch any vehicle loaded with material to be incorporated into the Project when the gross vehicle weight exceeds the limit established by law.
6. Ready Mix Concrete trucks shall comply with load restrictions as specified in Laboratory Standard Operating Procedure 10, “Quality Assurance for Ready-Mixed Concrete Plants in Georgia.”

**D. Responsibilities**

It will be the responsibility of the Contractor to advise his personnel, and all equipment users included in Subsection 107.14.A, as to the load restrictions and stipulations contained herein.

**E. Excess Loads and Violations**

If multiple violations assignable to a given Certified Public Weigher are occurring, that Certified Public Weigher may be suspended from weighing materials dispatched to Department of Transportation projects.
107.15 Responsibility for Damage Claims

The Contractor shall indemnify and save harmless the Department, its officers and employees, from all suits, actions, or claims of any character brought because of any injuries or damage received or sustained by any person, persons, or property on account of the operations of the said Contractor; or on account of or in consequence of any neglect in safe-guarding The Work; or through use of unacceptable materials in constructing The Work; or because of any act of omission, neglect or misconduct of said Contractor; or because of any claims or amounts recovered from any infringements of patent, trademark, or copyright; or from any claims or amounts arising or recovered under the Workmen’s Compensation Act, or any other law, ordinance, order, or decree; and so much of the money due the said Contractor under and by virtue of his Contract as may be considered necessary by the Department for such purpose may be withheld for the use of the State; or, in case no money is due, his surety may be held until such suit or suits, action or actions, claim or claims for injuries or damages as aforesaid shall have been settled and suitable evidence to that effect furnished to the Department; except that money due the Contractor will not be withheld when the Contractor produces satisfactory evidence that he is adequately protected by public liability and property damage insurance.

107.16 Opening Sections of Project to Traffic

Whenever any bridge or section of roadway is in acceptable condition for travel, the Engineer may direct that it be opened to traffic, whether or not the opening was originally provided for, and such opening shall not be held to be in any way an acceptance of the bridge or roadway, or any part thereof, or as a waiver of any of the provisions of the Contract. Necessary repairs or renewals made on any section of the roadway or bridge thus opened to traffic under instructions from the Engineer, due to defective material or work, or to any cause other than ordinary wear and tear, pending completion and acceptance of the roadway, bridge, or other work, shall be done by the Contractor, without additional compensation. Also, the Contractor shall not receive additional compensation for completing the Work except as specified in Subsection 104.03.

If the Contractor is dilatory in completing shoulders, drainage structures, or other features of work, the Engineer may so notify him in writing and establish therein a reasonable period of time in which the Work should be completed. If the Contractor is dilatory, or fails to make a reasonable effort toward completion in this period of time, the Engineer may then order all or a portion of the Project opened to traffic. On such sections which are so ordered to be opened, the Contractor shall conduct the remainder of his construction operations so as to cause the least obstruction to traffic and shall not receive any added compensation due to the added cost of the Work by reason of opening such section to traffic.

On any section opened to traffic under any of the above conditions, whether stated in the Special Provisions or opened by necessity of Contractor’s operations, or unforeseen necessity, any damage to the highway not attributable to traffic which might occur on such section (except slides) shall be repaired by the Contractor at his expense. The removal of slides shall be done by the Contractor on a basis agreed to prior to the removal of such slides.

107.17 Contractor’s Responsibility for the Work

From the first day the Contractor begins work, or from the date Contract Time commences, whichever occurs first, until written final acceptance of the project by the Engineer, the Contractor shall have the charge and care thereof and shall take every precaution against injury or damage to any part thereof by the action of the elements or from any other cause, whether arising from the execution or from the non-execution of The Work. The Contractor shall rebuild, repair, restore, and make good all injuries or damages to any portion of The Work occasioned by any of the above causes before final acceptance and shall bear the expense thereof except that the Department may, in its discretion, reimburse the Contractor for the repair of damage to The Work due to unforeseeable causes beyond the control of and without the fault or negligence of the Contractor, including but not restricted to acts of God, of the public enemy or of governmental authorities. The Contractor’s responsibility for damages and injuries is defined in Subsection 104.05.A.

In case of suspension of work from any cause whatsoever, the Contractor shall be responsible for the Project and shall take such precautions as may be necessary to prevent damage to the Project, provide for normal drainage and shall erect any necessary temporary structures, signs, or other facilities at his expense.

107.18 Acquisition of Right-of-Way

Rights of Way for the project will be obtained by the Department, in coordination with local governments and others. However, the Contractor’s access to the portions of the right-of-way may be restricted. Where such
restrictions are known in advance to the Department they will be listed in the bid proposal. Delays to the progress of the Work may be encountered because of restricted access to portions of the right-of-way. When such delays occur, whether caused by restrictions listed in the bid proposal or restrictions that develop after the Contract is signed, the parties agree in executing the Contract that such delays do not constitute breach of the Contract. Delays in availability of right-of-way beyond those listed in the bid proposal, or that develop after the Contract has been signed, that impact the controlling Item or Items of the Work will not be charged against the Contract Time. Additional compensation for such delays shall not be paid, except as provided in Subsection 105.13, “Claims for Adjustments and Disputes,” or Subsection 109.09, “Termination Clause.” In the event the Department is unable to acquire right-of-way needed for the project, resulting in delay to or termination of the project, such situation will also be controlled by this Section, and will not constitute a breach of the Contract by the Department.

107.19 Personal Liability of Public Officials
In carrying out any of the provisions of the Contract or in exercising any power or authority granted to the Board, Commissioner, Chief Engineer, their agents and employees, by the Contract, there shall be no liability, either personally or as officials or representatives of the Department, it being understood that in all such matters they act solely as agents and representatives of the Department.

107.20 No Waiver of Legal Rights
Upon completion of The Work, the Department will expeditiously make final inspection and notify the Contractor of acceptance. Such final acceptance, however, shall not preclude or estop the Department from correcting any measurement, estimate, or certificate made before or after completion of The Work, nor shall the Department be precluded or estopped from recovering from the Contractor or his Surety, or both, such over-payment as it may sustain, or by failure on the part of the Contractor to fulfill his obligations under the Contract. A waiver on the part of the Department of any breach of any part of the Contract shall not be held to be a waiver of any other or subsequent breach.

The Contractor, without prejudice to the terms of the Contract, shall be liable to the Department for latent defects, fraud, or such gross mistakes as may amount to fraud, or as regards the Department’s rights under any warranty or guaranty.

107.21 General Description
The Contractor shall designate, prior to beginning any work, a Worksite Utility Coordination Supervisor (WUCS) who shall be responsible for initiating and conducting utility coordination meetings and accurately recording and reporting the progress of utility relocations and adjustment work. Also, the WUCS shall prepare an Emergency Response Plan for the purpose of planning, training, and communicating among the agencies responding to the emergency. The WUCS shall be the primary point of contact between all of the Utility companies, the Contractor and the Department. The WUCS shall recommend the rate of recollection for utility coordination meetings and the Engineer will have the final decision on the regularity for utility coordination meetings. In no case will utility coordination meetings occur less than monthly until controlling items of utility relocations and adjustment milestones are completed. The WUCS shall contact each of the utility companies for the purpose of obtaining information including, but not limited to, a Utility Adjustment Schedule for the controlling items of utility relocations and adjustments. The WUCS shall notify the appropriate utility company and/or utility subcontractors and the Department of the status of controlling items of relocations and adjustment milestones as they are completed. The WUCS shall furnish the Engineer, for approval, a Progress Schedule Chart, immediately following the receipt of the Notice to Proceed unless otherwise specified, which includes the utility companies controlling items of work and other information in accordance with Section 108.03 or elsewhere in the Contract documents.

A. Qualifications
The WUCS shall be an employee of the Prime Contractor, shall have at least one year experience directly related to highway and utility construction in a supervisory capacity and have a complete understanding of the Georgia Utilities Protection Center operations, and shall be knowledgeable of the High-voltage Safety Act and shall be trained on the Georgia Utility Facility Protection Act (GUFPA). The Department does not provide any training on GUFPA but will maintain a list of the Georgia Public Service Commission certified training programs developed by other agencies. Currently the following companies offer approved GUFPA training programs:

Associated Damage Consultants
The Prime Contractor is responsible for obtaining the GUFPA training for their employees. Questions concerning the Georgia Public Service Commission GUFPA training program should be directed to:

Georgia Public Service Commission
244 Washington St. SW
Atlanta, GA 30334
404.463.9784

B. Ticket Status
During the utility coordination meetings the WUCS shall collect and maintain the Ticket Status information to determine the status of all locate requests within the project limits. This information will be used to assure those planning to use mechanized equipment to excavate or work within the project limits are prepared to begin work when they have reported or estimated beginning work. At points where the Contractor’s or utility company’s operations are adjacent to or conflict with overhead or underground utility facilities, or are adjacent to other property, damage to which might result in considerable expense, loss, or inconvenience, work shall not commence until all arrangements necessary for the protection thereof have been made.

C. Notice
The names of known utility companies and the location of known utility facilities will be shown on the Plans, or listed in the Subsurface Utility Engineering Investigation if performed or in the Special Provisions; and the WUCS shall give 24-hour notice to such utility companies before commencing work adjacent to said utility facilities which may result in damage thereto. The WUCS shall further notify utility companies of any changes in the Contractor’s work schedules affecting required action by the utility company to protect or adjust their facilities. Notice to the utility companies by the Department of the Award of Contract, under Subsection 105.06, shall not be deemed to satisfy the notice required by this paragraph. Furthermore, this 24-hour notice shall not satisfy or fulfill the requirements of the Contractor as stated in Chapter 9 of Title 25 of the Official Code of Georgia Annotated, known as the "Georgia Utility Facility Protection Act".

D. Agenda
The WUCS shall cooperate with the companies of any underground or overhead utility facilities in their removal and relocations or adjustment work in order that these operations may progress in a reasonable manner, that duplication of their removal and relocations or adjustment work may be reduced to a minimum, and services rendered by those parties will not be unnecessarily interrupted. To promote this effort the WUCS shall prepare an agenda for the utility coordination meetings and circulate same in advance of the meeting to encourage input and participation from all of the utility companies. The agenda will be prepared by an examination of the project site and may include photographs of potential/actual utility conflicts.

E. Emergency Response Plan
The WUCS shall prepare an Emergency Utility Response Plan (EURP) within 30 days following the receipt of the Notice to Proceed. The EURP shall indicate the project location (which includes street address and or major intersections / major highway route, if possible with a land mark) that would be reported in case of an emergency. WUCS, Emergency Utility Coordinator (EUC), utility company name, utility company emergency contact information to include but not limited to emergency phone number, response time for emergency, working condition of devices needed to facilitate prompt shut off, and primary point of contact name and phone number for the project.
Emergency Utility Coordinator (EUC) shall be an employee of the Prime Contractor and shall notify the appropriate utility company and/or utility subcontractors in case of an emergency. EURP must include the contact details of the EUC, if WUCS is not the primary emergency utility coordinator for this project.

The plan will also include a means of reporting emergencies and the Utility Emergency Response Information for each company. The WUCS/EUC shall post the EURP in an area readily accessible to the Department and project personnel. Also, WUCS shall distribute the copies of EURP by e-mail and hard copy to GA DOT Area Engineer, GA DOT Construction Project Engineer, Contractor’s project manager, superintendent, and all approved sub-contractors whose work can be in conflict with utilities facilities, personnel of the each facility/owner/operator who has facilities within the project limits and keep a copy in close proximity to active construction.

In the event of interruption to gas, water or other utility services as a result of accidental breakage or as a result of being exposed or unsupported, the WUCS/EUC shall promptly notify the appropriate emergency officials, the Georgia Utilities Protection Center and the appropriate utility facility company or operator, if known. Until such time as the damage has been repaired, no person shall engage in excavating or blasting activities that may cause further damage to the utility facility.

In order to keep up with the latest / most updated EURP contact information (name and phone numbers); WUCS shall include an item in the agenda of Utility Coordination meeting about the updates / changes in the EURP plan.

The Emergency Utility Response Plan and Emergency Utility Response Information template can be found at the State of Georgia, Office of Utilities Webpage.

F. Submission
Provisions for reporting all utility coordination meetings, the progress of utility relocation and adjustment work milestones and ticket status information will be reported on a formdeveloped by the WUCS and will be distributed by the WUCS to all of the utility companies as milestones are met and shall be included as part of the project records. These reports shall be delivered to the Engineer for review, on a monthly basis. The WUCS shall immediately report to the Engineer any delay between the utility relocation and adjustment work, the existing Utility Adjustment Schedule, or the proposed Utility Adjustment Schedule so that these differences can be reconciled.

G. Delays
Delays and interruptions to the controlling Item or Items of The Work caused by the adjustment or repair of water, gas, or other utility appurtenances and property may be considered for an extension of Contract Time as provided in Subsection 108.07.E unless such delays are due to the negligence of the Contractor.

H. Facilities Supported on Bridges
If the utility facilities are to be supported on bridges, the following provisions shall apply:
1. The Plans will show the location of the facility and the auxiliary items necessary to support the facility.
2. The Contractor constructing the bridge shall install anchor bolts, thimbles, inserts, or other auxiliary items attached to the bridge as a part of the support for the utility facility. The Utility Company shall furnish these auxiliary items, unless the Contract indicates these items are to be furnished by the Contractor as a part of the bridge construction.
3. The Utility or its subcontractor constructing the utility facility shall install hanger rods, pipe rollers, and other attachments necessary for the support of the utility facility as indicated on the Plans. The Utility Company shall furnish these attachments at no cost to the Department or the prime contractor unless otherwise specified. This work shall also include:
   a. Caulking the openings around the utility where it passes through endwalls to prevent the passage of undesirable materials.
   b. Painting the exposed portions of utility supports unless such supports are corrosion resistant. Painting shall be done in accordance with the applicable portions of Section 535, unless otherwise specified.
4. The sequence of bridge construction work may be set forth in the Plans and/or the Special Provisions and will show at what stage of the Work a utility company will be allowed to make the utility installation. Further, all or any portion of The Work under Subsection 107.21.H.3 may be included in the bridge Contract by the Plans and/or the Special Provisions.
5. Any damage to the bridge structure caused by the utility installation shall be repaired to the satisfaction of the Engineer at the expense of the Utility or its subcontractor installing the utility facility.

**I. Clearances**
The Plans provide for at least minimum clearance of utilities as required by the National Electrical Safety Code, U.S. Department of Commerce, and National Bureau of Standards. Any additional clearance the Contractor may desire or require in performing The Work shall be arranged by the Contractor with the utility company. The Department will pay no extra compensation for such additional clearances.

**J. Utility Relocation Progress Schedule**
The purpose of the Utility Adjustment Schedule is to provide the Contractor with the pertinent information, including any utility staging required, dependent activities, or joint-use coordination that is required for the creation of a feasible progress schedule. A suitable Utility Adjustment Schedule form is available from the Department for the WUCS to circulate to utility companies for any proposed project construction staging or should a utility company not duly file a Utility Adjustment Schedule to the Department during the preconstruction phase of the project. The WUCS shall submit a Utility Relocation Progress Schedule showing together the Progress Schedule Chart referenced in Section 108.03 and the proposed Utility Adjustment Schedules from all utility companies to the Engineer for review and approval. Copies of existing Utility Adjustment Schedules with utility companies having facilities on this project will be made available at the Georgia Department of Transportation, Office of Construction Bidding Administration, located at One Georgia Center, 600 West Peachtree Street, NW, Atlanta, GA 30308, for examination by the Contractor. The Utility Adjustment Schedules are available on-line at: http://www.dot.ga.gov/doingbusiness/contractors/Pages/default.aspx

**K. Compensation**
There will be no separate measurement or payment for this Work. The cost associated with this Work shall be included in the overall Bid submitted.

**107.22 Hazardous and/or Toxic Waste**
When the Contractor’s operations encounter or expose any abnormal condition which may indicate the presence of a hazardous and/or toxic waste, such operations shall be discontinued in the vicinity of the abnormal condition and the Engineer shall be notified immediately. The presence of barrels, discolored earth, metal, wood, or visible fumes, abnormal odors, excessively hot earth, smoke, or anything else which appears abnormal may be indicators of hazardous and/or toxic wastes and shall be treated with extraordinary caution as they are evidence of abnormal conditions.

The Contractor’s operations shall not resume until so directed by the Engineer.

Disposition of the hazardous and/or toxic waste will be made in accordance with the requirements and regulations of the Department of Human Resources and the Department of Natural Resources. Where the Contractor performs work necessary to dispose of hazardous and/or toxic waste, payment will be made at the unit prices for pay items included in the contract which are applicable to such work or, where the contract does not include such pay items, payment will be as provided in Subsection 109.05, “Extra Work.”

**107.23 Environmental Considerations**

A. Construction

- Erosion control measures shall be installed, to the greatest practical extent, prior to clearing and grubbing. Particular care shall be exercised along streambuffers, wetlands, open waters and other sensitive areas to ensure that these areas are not adversely affected.

- Construction equipment shall not cross streams, rivers, or other waterways except at temporary stream crossing structures shown on the plans or as allowed by permit.

- Construction activities within wetland areas are prohibited except for those within the construction limits as shown on the Plans and as specified in Subsection 107.23.E.
All sediment control devices (except sediment basins) installed on a project shall, as a minimum, be cleaned of sediment when one half the capacity, by height, depth or volume, has been reached. Sediment basins shall be cleaned of sediment when one-third the capacity by volume has been reached.

B. Bridge Construction Over Waterways

Construction waste or debris, from bridge construction or demolition, shall be prevented from being allowed to fall or be placed into wetlands, streams, rivers or lakes.

Excavation, dewatering, and cleaning of cofferdams shall be performed in such a manner as to prevent siltation. Pumping from cofferdams to a settling basin or a containment unit will be required if deemed necessary by the Engineer.

Operations required within rivers or streams, i.e. jetting or spudding, shall be performed within silt containment areas, cofferdams, silt fence, sediment barriers or other devices to minimize migration of silt off the project.

C. Environmental Clearance of Local Material or Disposal Sites

Specific written environmental approval from the Engineer will be required for any local material or disposal sites not included in the Plans. No work shall be started at any potential local material or waste site not shown on the plans prior to receiving said environmental approval from the Engineer. Local material sites are defined as borrow pits, common borrow, base, embankment, sand clay base, topsoil base, soil cement base, granular embankment, asphalt sand, maintenance pits, or stockpiled borrow sources. Disposals sites, as defined in Standard Specification 201.3.05.E.3, may be defined as excess material, common fill, or inert waste.

The Contractor may obtain environmental approval on a site with one of two methods: 1) GDOT provided environmental surveys or 2) environmental surveys obtained by the Contractor at no cost to the Department. The Contractor must choose one method for review and approvals, which will apply to all sites required for a given project, and submit an Environmental Review Notification indicating their chosen method.

1. If the Contractor chooses to obtain their own environmental surveys, they shall be conducted by a consultant(s) prequalified to work with the Department in the following area classes: 1.06(b) – History; 1.06(e) – Ecology; and 1.06(f) – Archaeology. Background research and field methods shall be conducted in accordance with the Office of Environmental Services Environmental Procedures Manual, with documentation in an Environmental Survey Results Memorandum (template available from the Office of Environmental Services).

2. If the Contractor requests that GDOT conduct required environmental surveys, an Environmental Survey Request shall be submitted for each site (template available from the Office of Environmental Services).

Upon receipt of an Environmental Survey Request, the Office of Environmental Services shall provide environmental approval or denial within thirty (30) business days. Upon receipt of an Environmental Survey Results Memorandum, the Office of Environmental Services shall provide environmental approval or denial within ten (10) business days. The Department will not accept requests for review of sites before a Notice to Proceed is issued. Incomplete Survey Requests, surveys that are not conducted by a GDOT prequalified consultant, or surveys that do not meet the required level of field effort or documentation, will be denied by GDOT OES and may require resubmittal.

The Engineer will inform the Contractor in writing as to the approval or denial of environmental clearance. Approvals may be provided upon condition that an Environmentally Sensitive Area (ESA) be designated within or adjacent to the site prior to use. All ESA stipulations shall be adhered to in accordance with Standard Specification 107.23.F. If a site is denied, the Contractor may, at no expense to the Department, seek to obtain permits or pursue other remedies that might otherwise render the site(s) acceptable, if available.

Any and all changes to proposed sites or their associated haul roads that are not included within the original Environmental Survey Request or Environmental Survey Results Memorandum, including expansion,
utilization for purposes other than those indicated in the original submittal, etc. must be submitted for further environmental review and approval prior to use.

Sites included in the Plans have environmental clearance and shall be used only for the purpose(s) specified in the Plans or other contract documents. Should the Contractor wish to expand or utilize said sites for any purpose other than that provided for in the Plans or other contract documents, specific written environmental clearance as noted above shall be obtained.

D. **Control of Pollutants**

Pollutants or potentially hazardous materials, such as fuels, lubricants, lead paint, chemicals or batteries, shall be transported, stored, and used in a manner to prevent leakage or spillage into the environment. The Contractor shall also be responsible for proper and legal disposal of all such materials.

Equipment, especially concrete or asphalt trucks, shall not be washed or cleaned-out on the Project except in areas where unused product contaminants can be prevented from entering waterways.

E. **Temporary Work in Wetlands Outside of the Construction Limits within the Right-of-Way and Easement Areas**

Temporary work in wetlands (that are not delineated with orange barrier fence) will be subject to the following requirements:

1. Temporary work in wetlands shall be accomplished by using temporary structures, timber, concrete, soil with geotextile fabric, or other suitable matting. The area shall not be grubbed.
2. Soil matting shall be protected from erosion in accordance with the Specifications.
3. Whenever temporary work is required in Saltwater Marsh Wetlands, all temporary structures and/or matting shall be removed in their entirety prior to Final Acceptance of the Project. Matt and compressed soils shall be backfilled to their original ground elevation with material meeting the requirements of Section 212 – Granular Embankment.
4. Whenever temporary work is required in Freshwater Wetlands, all temporary structures and/or matting (exclusive of soil matting to be retained in the final roadway section) shall be removed in their entirety prior to Final Acceptance of the Project.

   Once the temporary materials have been removed, the area shall be covered by Excelsior or Straw blankets according to Section 713 of the Specifications. The grassing and ground preparation referenced in Subsection 713.3.03, “Preparation”, will not be applicable to this Work.
5. The Engineer shall be notified so that a field inspection may be conducted to certify that the temporary materials were properly removed and that the area was properly restored. The Contractor shall be responsible for any corrective action required to complete this Work.
6. There will be no separate measurement or payment for this Work. The cost associated with this work shall be included in the overall Bid submitted.

F. **Environmentally Sensitive Areas**

Some archaeological sites, historic sites, wetlands, streams, stream and pond buffers, open waters and protected animal and plant species habitat within the existing/required Right-of-Way and easement areas may be designated as ENVIRONMENTALLY SENSITIVE AREAS (ESAs). These areas are shown on the applicable Plan sheets and labeled “ESA” (e.g. ESA – Historical Boundary, ESA – Wetland Boundary). The Department may require that some ESAs or portions thereof be delineated with orange barrier fence. The Contractor shall install, maintain, and replace as necessary orange barrier fence at ESAs as delineated in the Plan sheets.

The Contractor shall not enter, disturb, or perform any construction related activities, other than those shown on the approved plan sheets within areas designated as ESAs including ESAs or portions thereof not delineated with orange barrier fence. This includes but is not limited to the following construction activities: clearing and grubbing; borrowing; wasting; grading; filling; staging/stockpiling; vehicular use and parking;
sediment basin placement; trailer placement; and equipment cleaning and storage. Also, all archaeological sites, historic sites, wetlands, streams, stream and pond buffers, open waters, and protected animal and plant species habitat that extend beyond the limits of existing/required Right-of-Way and easement areas shall be considered ESAs and the Contractor shall not perform any construction related activities (such as those listed above) within these areas or make agreements with property owners to occupy these areas for construction related activities (such as those listed above). The Contractor shall make all construction employees aware of the location(s) of each ESA and the requirement to not enter or otherwise disturb these areas.

If the Contractor is found to have entered an ESA, either within or outside the project area, for any purpose not specifically shown on the approved plans, the Department may, at its discretion, issue a stop work order for all activities on the project except erosion control and traffic control until such time as all equipment and other items are removed and the ESA is restored to its original condition.

However, should damage to an ESA occur as a result of the Contractor’s action in violation of this section, and notwithstanding any subsequent correction by the Contractor, the Contractor shall be liable for any cost arising from such action, including but not limited to, the cost of repair, remediation of any fines, or mitigation fees assessed against the Department by another government entity.

G. Protection of Migratory Birds and Bats

The following conditions are intended as a minimum to protect migratory birds and bats during construction activities.

1. Project personnel shall be advised about the potential presence and appearance of federally protected migratory birds, including the barn swallow (*Hirundo rustica*), cliff swallow (*Petrochelidon pyrrhonota*), and eastern phoebe (*Sayornis phoebe*), and that there are civil and criminal penalties for harassing, harming, pursuing, hunting, shooting, wounding, killing, capturing, or collecting these species in violation of the Migratory Bird Treaty Act of 1918. The law protects adults, fledglings, nestlings, eggs, and active nests. All bats are protected under Georgia state law (Official Code of Georgia § 27-1-28), with some species protected under the federal Endangered Species Act of 1973. Pictures and habitat information shall be posted in a conspicuous location in the Project field office until such time that construction has been completed and time charges have stopped.

2. The demolition of existing bridge and culvert, the extension of existing culvert, and bridge maintenance activities on the underside of the bridge deck shall take place outside of the breeding and nesting season of phoebes, swallows and other migratory birds, which begins April 1 and extends through August 31, unless exclusionary barriers are in place to prevent birds from nesting. For bridges, exclusionary barriers may be made of plastic, canvas or other materials proposed by the Contractor and approved by the State Environmental Administrator prior to installation. For box culverts, exclusionary barriers may be overlapping strips of flexible plastic (also called “PVC Strip Doors” or “Strip Curtains”) or an alternate material proposed by the Contractor and approved by the State Environmental Administrator prior to installation. Exclusionary barriers must be installed on the bridge(s) and/or box culvert(s) prior to March 1 or after August 31, but in no time in between this period. Exclusionary barriers are not a guaranteed method of preventing migratory birds from nesting beneath bridges and work schedules shall take into account the possibility that barriers will not be successful. If exclusionary barriers are to be used, these steps shall be followed:

   a. The Project ecologist shall be notified by phone (404) 631-1100 of the decision to install exclusionary barriers and the date of the proposed installation prior to the installation of any exclusionary devices.

   b. The structure(s) shall be checked for nests prior to the placement of exclusionary barriers. If nests are present, they shall be inspected to ensure that eggs or birds are not present. If the nests are found to be occupied, construction activities associated with the bridge shall be postponed until after August 31 when the breeding season is complete.
c. For any box culvert(s) being replaced, exclusionary barriers shall be installed on both the inlet and outlet openings. For any box culvert(s) being extended, exclusionary barriers shall be placed on the opening(s) (inlet and/or outlet) where work is taking place. For bridge(s) being removed, barriers shall be installed along the full length of the bridge(s). In all cases, barriers shall be installed prior to March 1 and left in place until August 31 or until the culvert removal, culvert extension, or bridge demolition is complete. If the exclusionary barriers fail to prevent nesting (i.e., birds are able to bypass barriers and build nests), construction activities associated with the bridge shall be postponed until after August 31.

d. During construction activities, exclusionary barriers shall be inspected daily for holes or other defects that impair its ability to exclude migratory birds from nesting beneath the bridge. Any holes or defects shall be repaired immediately.

e. Entanglement and/or entrapment of barn swallows, cliff swallows, and eastern phoebes in exclusionary netting constitutes harm to migratory birds. Any entanglement and/or entrapment of migratory birds shall be reported immediately to the Project Engineer, who in turn will notify the State Environmental Administrator, Georgia Department of Transportation, Office of Environmental Services at (404) 631-1101.

3. Migratory birds may nest in other structures or natural features that will be impacted by construction activities. If active nests containing eggs are encountered within the footprint of construction activities, the finding shall be reported immediately to the Project Engineer, who in turn shall notify the State Environmental Administrator, Georgia Department of Transportation, Office of Environmental Services at (404) 631-1101. All activity within 50 feet of active nests shall cease pending consultation by the Department with the U.S. Fish and Wildlife Service and the lead Federal Agency.

4. When working on bridges and culverts, sightings of bat species shall be reported immediately to the Project Engineer who in turn will notify the State Environmental Administrator, Georgia Department of Transportation, Office of Environmental Services at (404) 631-1101. All construction activity on the structure shall cease pending consultation by the Department with the U.S. Fish and Wildlife Service and/or the Georgia Department of Natural Resources and/or the lead Federal Agency. The Department will inform the Contractor of any changes to the project.

5. In the event any incident occurs that causes harm or injury to migratory birds during construction activities, the incident shall be reported immediately to the Project Engineer who in turn shall notify the State Environmental Administrator, Georgia Department of Transportation, Office of Environmental Services at (404) 631-1101. All activity shall cease pending consultation by the Department with the U.S. Fish and Wildlife Service and the lead Federal Agency.

6. Within 30 days of the completion of construction and the stopping of time charges, a report shall be provided to the State Environmental Administrator, Georgia Department of Transportation, Office of Environmental Services, 600 West Peachtree Street NW, Atlanta, Georgia 30308. GDOT in turn will provide copies of the report to the U.S. Fish and Wildlife Service, the Georgia Department of Natural Resources Wildlife Resources Division, and the lead Federal Agency. The following information will be included in the report:

a. Contractor name and address.

b. Name and title of report preparer.

c. GDOT Project Identification (PI) number.

d. County(s) in which project is located.

e. Project description.
f. Construction start and end dates.
g. Date GDOT was notified of intent to install barrier(s) per # 107.23G.2.a.
h. Number and type(s) of structures on which exclusion barriers were installed.
i. Type(s) of exclusion material used on each structure.
j. Start and end date(s) of installation of exclusionary barrier on each structure.
k. Start and end date(s) of removal of exclusionary barrier from each structure.
l. Photographs of each structure before and after exclusionary barrier installation.
m. Statement regarding whether the exclusionary barrier was effective in deterring bird use of the structure during construction.
n. Description of any incidents causing harm or injury to migratory birds during construction. This should include incidents that were reported as required under 107.23G.5.
o. Description of any sightings of bat species when working on bridges and culverts. This should include incidents that were reported as required under 107.23G.4.

7. All costs pertaining to any requirement contained herein shall be included in the overall bid submitted unless such requirement is designated as a separate Pay Item in the Proposal.

107.24 Closing of Roadways without On-Site Detours

When existing roadways are to be closed to through traffic and on-site detours are not provided, the Contractor shall submit a written notice to the Engineer for approval 14 days prior to the closure of the existing roadways.

After receiving approval from the Engineer for the closure, the Contractor shall install signs at each closure site, in accordance with the MUTCD, to inform the traveling public of the proposed closure, including the date of closure. The sign shall be placed 5 days prior to the closure, at the direction of the Engineer.

Prior to the closure, the Area Engineer will inform local government officials and agencies, local news media, and the DOT Public Information Office of the proposed closure of the roadways.

107.25 Disruption to Residential and Commercial Property

The Contractor shall plan, coordinate, and prosecute the work such that disruption to personal property and business is held to a practical minimum.

All construction areas abutting lawns and yards of residential or commercial property shall be restored promptly. Backfilling of each drainage structure or section of curb and gutter, sidewalk, or driveway shall be accomplished as soon as adequate strength is obtained. Finishing, dressing and grassing shall be accomplished immediately thereafter as a continuous operation within each area being constructed with emphasis placed on completing each individual yard or business frontage. Care shall be taken to provide positive drainage to avoid ponding or concentration of runoff.

Handwork, including raking and smoothing, shall be required to ensure that roots, sticks, rocks, and other debris is removed in order to provide a neat and pleasing appearance. Grassing, when in season, shall immediately follow in order to establish permanent cover at the earliest date. If grassing is not in season, proper erosion control shall be installed and maintained.

The work described herein shall be in addition to that required by Subsection 104.07 “Final Cleaning Up” and Subsection 105.16 “Final Inspection and Acceptance.”
Georgia Department of Transportation

Technical Provisions

For

Design-Build Agreement

P.I. No. 210327-

Attachment 12-1

MS4 RESPONSIBILITIES FOR DESIGN-BUILD PROJECT
## MS4 Responsibilities – Design-Build Project

<table>
<thead>
<tr>
<th>2017-2022 Permit No. GAR041000 Ref.</th>
<th>Best Management Practice (BMP)</th>
<th>Activity Description</th>
<th>Design-Build Team</th>
<th>GDOT</th>
<th>PM</th>
<th>3rd Party</th>
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<tbody>
<tr>
<td><strong>Public Education</strong></td>
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<tr>
<td>4.2.1-1</td>
<td>DOT website to educate the public regarding stormwater related topics (e.g. litter prevention, Adopt-A-Highway)</td>
<td>N/A</td>
<td></td>
<td>✓</td>
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<tr>
<td>4.2.1-2</td>
<td>Training program to educate contractors and employees conducting activities that may impact stormwater runoff</td>
<td>Attend periodic training related to stormwater impacts including Construction Engineering &amp; Inspection for Post-Construction BMPs (CEI) course, Facility Stormwater Pollution Prevention (F-SWPP) and Overview of Post-Construction Stormwater (O-PCS).</td>
<td>✓✓✓✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.2.1-3</td>
<td>Distribution of stormwater related educational materials to the public</td>
<td>N/A</td>
<td></td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.2.1-4</td>
<td>Storm draining marking, and/or pet waste program in high pedestrian areas, such as welcome centers / rest areas, maintenance facilities, and along streets with sidewalks within a permitted area</td>
<td>N/A</td>
<td></td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Public Involvement</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.2.2-1</td>
<td>Adopt-A-Highway Program</td>
<td>N/A</td>
<td></td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.2.2-2</td>
<td>Public Information Open Houses (PIOHs) to allow public input into projects</td>
<td>Conduct all appropriate public information open houses as applicable. As part of each public information open house, contact GDOT Office of Design Policy to ensure that a Stormwater Management Program display is provided and displayed at the open house. Provide the number of open houses conducted each year.</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.2.2-3</td>
<td>Memorandum of Agreements</td>
<td>N/A</td>
<td></td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Illicit Discharge Detection and Elimination</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.2.3-1</td>
<td>Outfall Map and Inventory</td>
<td>Provide a list of new outfalls within the project area indicating the location and geographic coordinates for each outfall. Provide all information per SP 156.</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.2.3-2</td>
<td>A policy that prohibits non-stormwater discharges into the MS4</td>
<td>N/A</td>
<td></td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.2.3-3</td>
<td>An Illicit Discharge Detection and Elimination (IDDE) Plan</td>
<td>Conduct inspections of outfalls within the project area each year inspecting the outfalls for the presence of dry weather discharges in accordance with the IDDE plan. For a copy of the IDDE plan, contact the GDOT Office of Design Policy. Provide a copy of the inspection reports (see the IDDE plan) for each outfall inspected. If a dry weather discharge is detected, contact the District Environmental Compliance Engineer for further investigation / action.</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.2.3-4</td>
<td>Procedures for tracing and eliminating any identified illicit discharges</td>
<td>N/A</td>
<td></td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2017-2022 Permit No.</td>
<td>Best Management Practice (BMP)</td>
<td>Activity Description</td>
<td>Design-Build Team</td>
<td>GDOT</td>
<td>PMC</td>
<td>Aud  &amp; C.</td>
</tr>
<tr>
<td>----------------------</td>
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</tr>
<tr>
<td>GAR041 000 Ref.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.2.3-5</td>
<td>Education</td>
<td>N/A</td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>4.2.3-6</td>
<td>Procedures for receiving and responding to complaints related to illicit discharges</td>
<td>Report all complaints related to illicit discharges to the District Environmental Compliance Engineer. Provide a summary of the number of complaints and summary of resolution including the date and time received each year for the project area to GDOT.</td>
<td></td>
<td></td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>4.2.3-7</td>
<td>Spill response procedures</td>
<td>Report all spills in accordance with the IDDE plan and the Georgia Oil or Hazardous Material Spills and Releases Reporting. If a spill occurs and the spill reaches an MS4 structure, report the spill to the District Environmental Compliance Engineer.</td>
<td></td>
<td></td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>4.2.4</td>
<td>Construction Site Runoff Stormwater Control</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.2.4-1</td>
<td>A contractual obligation mechanism</td>
<td>Requires erosion and sediment controls consistent with the Manual for Erosion and Sediment Control in Georgia and the Construction General Permits, as well as penalties to ensure compliance, to the extent allowable, under State or local law.</td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>4.2.4-2</td>
<td>Erosion, Sedimentation and Pollution Control Plans (ESPCPs)</td>
<td>Prepare and submit to EPD an ESPCP that complies with the requirements of the most recent Construction Activity Permits, which identify the Manual for Erosion and Sediment Control in Georgia (Green Book) and stream buffer requirements for all land disturbance activities that require coverage.</td>
<td></td>
<td></td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>4.2.4-3</td>
<td>Procedures for receiving and responding to erosion and sedimentation complaints</td>
<td>Report all complaints related to construction site runoff to the District Environmental Compliance Engineer. Provide a summary of the number of complaints and summary of resolution including the date and time received each year for the project area to GDOT.</td>
<td></td>
<td></td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>4.2.4-4</td>
<td>Site plan review procedures</td>
<td>Incorporate consideration of potential water quality impacts.</td>
<td></td>
<td></td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>4.2.4-5</td>
<td>Site inspection procedures in accordance with the Construction Activity Permits</td>
<td>Maintain inspections as required in the most recent Construction Activity Permits, which identify the Manual for Erosion and Sediment Control in Georgia (Green Book) and stream buffer requirements for all land disturbance activities that require coverage. Provide a copy of all inspections performed.</td>
<td></td>
<td></td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>4.2.4-6</td>
<td>Ensure through contracts or other mechanisms that construction site operators control waste that may cause adverse water quality impacts in accordance with the Construction Activity Permits</td>
<td></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>4.2.4-7</td>
<td>Procedures for bringing contractors back into compliance with the contract requirements</td>
<td>N/A</td>
<td></td>
<td></td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>4.2.5</td>
<td>Post-Construction Stormwater Management</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.2.5-1</td>
<td>Inventory of post-construction stormwater management structures, designed for filtering and/or detention</td>
<td>Provide an inventory of all permanent Post Construction Stormwater management structures following GDOT acceptance utilizing SP 156 for required data to be provided on each structure.</td>
<td></td>
<td></td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>2017-2022 Permit No. GAR041 000 Ref.</td>
<td>Best Management Practice (BMP)</td>
<td>Activity Description</td>
<td>Design-Build Team</td>
<td>GDOT</td>
<td>PMC</td>
<td>3rd Party</td>
</tr>
<tr>
<td>-------------------------------------</td>
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</tr>
<tr>
<td>4.2.5-2</td>
<td>Policy or other regulatory mechanism to address post-construction runoff</td>
<td>N/A</td>
<td></td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.2.5-3</td>
<td>Program for the long-term operation and maintenance of post-construction structures</td>
<td>Inspect and maintain Post Construction Stormwater management structures within the project area utilizing the inspection forms in the current effective GDOT Stormwater System Inspection &amp; Maintenance (I&amp;M) Manual. Report all maintenance performed on each structure utilizing GDOT Maintenance Activity Codes.</td>
<td></td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.2.5-4</td>
<td>Program for ensuring the use of a stormwater design manual and the feasibility of inclusion of the post-construction standards from Section 4.2.5.1 during the project design phase</td>
<td>Submit and secure approval of a Post Construction Stormwater Report for all applicable construction projects within the project area following the specifications in the most current GDOT Drainage Manual.</td>
<td></td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.2.5-4</td>
<td><strong>Green Infrastructure / Low Impact Development</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.2.5.4-1</td>
<td>Program for conducting a green infrastructure / low impact development (GI/LID) feasibility study, and implementing GI/LID infrastructure, where feasible</td>
<td>Submit and secure approval of a Post Construction Stormwater Report for all applicable construction projects within the project area following the specifications in the most current GDOT Drainage Manual.</td>
<td></td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.2.6</td>
<td>Pollution Prevention / Good Housekeeping for Municipal-Type Operations</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.2.6-1</td>
<td>Inventory of GDOT facilities conducting municipal-type activities that have the potential to cause pollutant runoff</td>
<td>N/A</td>
<td></td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.2.6-2</td>
<td>Program for inspecting the GDOT facilities for good housekeeping practices</td>
<td>Perform inspections on 20% of all GDOT accepted facilities annually utilizing the F-SWPPP such that all facilities are inspected over the course of 5 years.</td>
<td></td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.2.6-3</td>
<td>Manual detailing procedures for routine maintenance activities at municipal type operations to prevent pollutant runoff</td>
<td>Provide an annual copy of inspections and corrective actions implemented for each GDOT accepted facility utilizing the F-SWPPP for guidance.</td>
<td></td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.2.6-4</td>
<td>Inventory and Map of MS4 structures</td>
<td>Provide an inventory of all MS4 structures following GDOT acceptance utilizing SP 156 for required data to be provided on each structure.</td>
<td></td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.2.6-5</td>
<td>Program for inspecting and maintaining MS4 structures</td>
<td>Perform inspections on 10% of all GDOT MS4 structures within the project area annually utilizing the GDOT Stormwater System Inspection &amp; Maintenance Manual such that all structures are inspected over the course of 5 years. Report all maintenance performed on each structure utilizing GDOT Maintenance Activity Codes.</td>
<td></td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.2.6-6</td>
<td>An employee training program, with the purpose of preventing and reducing stormwater pollution from GDOT facilities and activities</td>
<td>All field personnel with supervisory capacity assigned to the project must have attended a GDOT F-SWPPP training course within 5 years of the contract date of the project. For those personnel that have not attended the training course within the previous 5 years, the training course must be completed within 6 months of assignment to the project.</td>
<td></td>
<td>✓</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Reporting:

GDOT’s NPDES Phase II MS4 permit requires that an annual report be submitted each year documenting compliance with all aspects of the permit from January 1st to December 31st (reporting period). To aid in that reporting, the contractor shall submit quarterly update reports documenting those activities undertaken during the reporting period as required in the matrix above. The deadlines for each update report shall be established as shown below:

<table>
<thead>
<tr>
<th>Quarter</th>
<th>Dates</th>
<th>Quarterly Update Report Due Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1</td>
<td>January 1st – March 31st</td>
<td>April 30th</td>
</tr>
<tr>
<td>Q2</td>
<td>April 1st – June 30th</td>
<td>July 31st</td>
</tr>
<tr>
<td>Q3</td>
<td>July 1st – September 30th</td>
<td>October 31st</td>
</tr>
<tr>
<td>Q4</td>
<td>October 1st – December 31st</td>
<td>January 31st</td>
</tr>
</tbody>
</table>
Georgia Department of Transportation

Technical Provisions

For

Design-Build Agreement

P.I. No. 210327-

Attachment 12-2

SPECIAL PROVISION FOR POST-CONSTRUCTION STORMWATER BMP ITEMS

SP 169 Post-Construction Stormwater BMP Items
169.1 General Description
This work includes constructing the following Post-Construction Best Management Practices (BMPs) as shown in the Plans or as directed by the Engineer:

- Bioretention basins
- Bioslopes
- Dry detention basins
- Enhanced dry swales
- Enhanced wet swales
- Infiltration trenches
- Sand filters
- Wet detention ponds
- Other permanent water treatment structures as shown on the Plans or as directed by the Engineer

169.1.01 Related References
A. Standard Specifications

Section 109—Measurement and Payment
Section 161—Control of Soil Erosion and Sedimentation
Section 208—Embankments
Section 500—Concrete Structures
Section 511—Reinforcement Steel
Section 573—Underdrains
Section 574—Edge Drains
Section 603—Rip Rap
Section 700—Grassing
Section 702—Vine, Shrub, and Tree Planting
Section 708—Plant Topsoil
Section 711—Turf Reinforcement Matting
Section 800—Coarse Aggregate
Section 801—Fine Aggregate
Section 805—Rip Rap and Curbing Stone
Section 806—Aggregate for Drainage
Section 814—Soil Base Materials
Section 830—Portland Cement
Section 839—Corrugated Polyethylene Underdrain Pipe
Section 846—PolyvinylChloride (PVC) Drain Pipe
Section 853—Reinforcement and Tensioning Steel
Section 881—Fabrics
Section 890—Seed and Sod
Section 893—Miscellaneous Planting Materials
Section 894—Fencing
Section 910—Sign Fabrication
Section 911—Sign Posts
Section 914—Sign Paint

B. Referenced Documents

AASHTO M-252
AASHTO M-294
AASHTO M-304
AASHTO T 215
ASTM D-422
ASTM D-698
ASTM D-1784
ASTM D-1785
ASTM D-2434
ASTM D-2466
ASTM D-2564
ASTM D-2665
ASTM D-3786
ASTM D-4491
ASTM D-4533
ASTM D-4632
ASTM D-4751
ASTM D-4833
ASTM F-758
ASTM F-949

169.1.02 Submittals

General Provisions 101 through 150.
### 169.2 Materials

Provide materials shown on the Plans, such as pipe, spillways, wood baffles, plants, and other accessories including an anti-seep collar, when necessary. Materials shall be approved by the Engineer before use.

Materials shall meet the requirements of the following Specifications:

<table>
<thead>
<tr>
<th>Material</th>
<th>GDOT Section/Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nonwoven geotextile filter fabric</td>
<td>ASTM D-3786: Mullen burst strength = 280 psi</td>
</tr>
<tr>
<td></td>
<td>ASTM D-4491: permittivity = 1.30 sec⁻¹</td>
</tr>
<tr>
<td></td>
<td>ASTM D-4533: Trapezoidal tear strength = 60 lb</td>
</tr>
<tr>
<td></td>
<td>ASTM D-4632: Grab tensile strength = 160 lb</td>
</tr>
<tr>
<td></td>
<td>ASTM D-4632: Grab tensile elongation = 50%</td>
</tr>
<tr>
<td></td>
<td>ASTM D-4751: AOS = 70 US standard sieve</td>
</tr>
<tr>
<td></td>
<td>ASTM D-4833: Puncture Resistance = 85 lb</td>
</tr>
<tr>
<td>Class A, AA, and B Concrete</td>
<td>500/ASTM C-76-10</td>
</tr>
<tr>
<td>Reinforcement Steel</td>
<td>511</td>
</tr>
<tr>
<td>Rip Rap</td>
<td>603, 805</td>
</tr>
<tr>
<td>Permanent Grass, Sod, and Other Vegetation</td>
<td>700</td>
</tr>
<tr>
<td>Turf Reinforcement Matting</td>
<td>711</td>
</tr>
<tr>
<td>Coarse Aggregate</td>
<td>800</td>
</tr>
<tr>
<td>Fine Aggregate</td>
<td>801</td>
</tr>
<tr>
<td>Soil Base Materials</td>
<td>814</td>
</tr>
<tr>
<td>Rip Rap and Curbing Stone</td>
<td>805</td>
</tr>
<tr>
<td>Portland Cement</td>
<td>830</td>
</tr>
<tr>
<td>Corrugated Polyethylene Underdrain Pipe</td>
<td>839/AASHTO M252 or M294</td>
</tr>
<tr>
<td>PVC Underdrains</td>
<td>846/ASTM F-758, ASTM F-949</td>
</tr>
<tr>
<td>Reinforcement and Tensioning Steel</td>
<td>853</td>
</tr>
<tr>
<td>Fabrics</td>
<td>881</td>
</tr>
<tr>
<td>Seed</td>
<td>890</td>
</tr>
<tr>
<td>Miscellaneous Planting Materials</td>
<td>893</td>
</tr>
<tr>
<td>Mulch</td>
<td>893.2.02</td>
</tr>
<tr>
<td>Engineered Topsoil</td>
<td>893.2.08</td>
</tr>
<tr>
<td>Signage</td>
<td>910, 911, 914</td>
</tr>
<tr>
<td>Landscape Plantings</td>
<td>702</td>
</tr>
</tbody>
</table>
A. Engineered Soil Mix Requirements

1. Use an engineered soil mix that meets the requirements herein. Do not use a mixture that contains deleterious substances. Obtain the materials from sources approved by the Engineer. Ensure that aggregate retained on No. 10 (2 mm) sieve is of hard, durable particles.

2. Remove particles with a diameter greater than 2 in (50 mm) before placing the engineered soil mix. Remove particles with screens or by hand if few oversized pieces exist. Otherwise, crush the oversized pieces to less than 2 in and use them in the proportions shown by the gradation table below.

3. Use 5-10% by dry weight composted organic matter as topsoil components. All components shall be free of heavy metals, pathogens, pesticides, and herbicides.

4. Use 90-95% by dry weight inorganic topsoil components with the following properties:

<table>
<thead>
<tr>
<th>Sieve Size</th>
<th>Percent Passing by Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Passing 2 in (50 mm)</td>
<td>100</td>
</tr>
<tr>
<td>Passing No. 4 (4.75mm)</td>
<td>98-100</td>
</tr>
<tr>
<td>Passing No. 8 (2.35 mm) sieve</td>
<td>95-100</td>
</tr>
<tr>
<td>Passing No. 10 (2.0 mm)</td>
<td>86-100</td>
</tr>
<tr>
<td>Passing No. 16 (1.18 mm) sieve</td>
<td>70-100</td>
</tr>
<tr>
<td>Passing No. 30 (600 µm) sieve</td>
<td>40-75</td>
</tr>
<tr>
<td>Passing No. 50 (300 µm) sieve</td>
<td>10-35</td>
</tr>
<tr>
<td>Passing No. 100 (150 µm) sieve</td>
<td>2-15</td>
</tr>
<tr>
<td>Passing No. 200 (75 µm) sieve</td>
<td>0-10</td>
</tr>
<tr>
<td>Clay size (&lt; 2 µm)</td>
<td>0-6</td>
</tr>
</tbody>
</table>

5. Ensure that material passing the No. 10 (2 mm) sieve meets the following requirements:

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liquid Limit (LL)</td>
<td>≤25</td>
</tr>
<tr>
<td>Plasticity Index (PI)</td>
<td>≤10</td>
</tr>
<tr>
<td>Volume Change, Maximum Percent</td>
<td>12</td>
</tr>
<tr>
<td>Maximum Dry Density, lb/ft³*</td>
<td>105</td>
</tr>
<tr>
<td>Permeability (in/hr)</td>
<td>1 – 6</td>
</tr>
<tr>
<td>Phosphorous Index (P-index)</td>
<td>&lt;25</td>
</tr>
</tbody>
</table>

*by standard Proctor

169.2.01 Fabrication

General Provisions 101 through 150.

169.2.02 Acceptance

The Contractor is required to submit a minimum of three (3) cubic-foot-sized random soil samples per 150 tons of material per each source to the Department’s Geotechnical Bureau of the Materials Office 20 working days before placement for testing to ensure acceptability for use as directed by the Project Engineer. The Department’s Geotechnical Bureau of the Materials Office reserves the right to disapprove the engineered soil mix for use if test results show that parameters do not meet the acceptable values specified above. Acceptance must be granted prior to placement.

The Department will test engineered soil mix as follows:
169.2.03 Materials Warranty
General Provisions 101 through 150.

169.2.04 Delivery, Storage, and Handling
General Provisions 101 through 150.

169.3 Construction Requirements

169.3.01 Personnel
General Provisions 101 through 150.

169.3.02 Equipment
General Provisions 101 through 150.

169.3.03 Preparation
General Provisions 101 through 150.

169.3.04 Fabrication
General Provisions 101 through 150.

169.3.05 Construction

A. Bioretention Basins

Construct bioretention basins as shown in the Plans, or as modified by the Engineer, after final grade and stabilization of the area upstream of each bioretention basin are achieved. If this is not feasible, stormwater flow shall be diverted around the bioretention basin and the area protected with temporary erosion and sediment control measures. Once the basin has been stabilized, vegetation shall be established within the bioretention basin per the details shown in the plans. Contractor shall maintain the bioretention basin after construction as outlined in the GDOT Stormwater System Inspection and Maintenance Manual until the project is turned over.

1. Excavation

Excavation should be limited to the width and length of the bioretention basin per the details shown in the plans or as directed by the Engineer. Avoid placing excavated material near the open trench so as not to jeopardize the stability of the trench sidewalls. The bottom of the excavated trench should be flat across its width and length, shall not be loaded in a way that causes soil compaction, and should be scarified prior to placement of specified materials. The sides of the trench shall be trimmed of all large roots. The sidewalls should be uniform with no voids and scarified prior to placement of materials for specified engineered drainage layers. Trench sidewalls shall be lined with the specified filter fabric. Infiltration testing should be performed prior to excavation of the bioretention basin if the bioretention basin is designed for infiltration. If infiltration is feasible, a second infiltration test is required prior to the placement of the underdrain system/aggregate layer to ensure that infiltration rates were not impacted during excavation.

2. Underdrain System/Aggregate Layer

Install underdrain system(s) made of perforated polyethylene or perforated PVC pipe at the locations and depth per details shown in the plans for conveyance of stormwater that has filtered through the media. Perforations shall be 3/8-inch diameter and spaced 6-inches on center with four rows running longitudinally. A removable end cap
3. **Engineered Soil Mix**
   Install the engineered soil mix specified above for a 18-inch-minimum-thickness and nonwoven geotextile filter fabric per the details shown in the plans. The engineered soil mix shall be placed in a maximum of 12-inch lifts and shall be protected from contamination by foreign matter during installation. If the engineered soil mix becomes contaminated or the filter fabric is damaged, remove contaminated or damaged materials and replace them at no additional cost to the Department. Avoid using heavy equipment within the basin area during installation to avoid compromising the hydraulic conductivity of the engineered soil mix and to prevent damage to the underdrains.

4. **Mulch Layer**
   The mulch layer of the bioretention basin shall be a minimum thickness of 3 inches and shall consist of triple shredded hardwood mulch resistant to floating (Georgia Department of Transportation Specification Subsection 893.2.02). The mulch layers should be well aged (stockpiled or stored for at least six months), uniform in color, and free of other materials, such as weed seeds, soil, roots, etc. Grass clippings or pine straw shall not be used as mulch material.

5. **Plantings**
   Plant species used in bioretention basins shall be installed per the details shown in the plans and meet the requirements outlined in Georgia Department of Transportation Specification Section 702. Plants shall be selected on the basis of a specified hydrologic tolerance zone and shall be capable of surviving both wet and dry conditions. All plants used shall be well grown and healthy and free from disease and infestation by invasive species. Trees shall not be planted in bioretention basins.

6. **Pretreatment**
   Install rip rap forebays, filter strips, level spreaders and other pretreatment devices per the details and at the locations specified in the plans. Rip rap used in pretreatment devices shall meet the requirements outlined in Georgia Department of Transportation Specification Sections 603 and 805 and woven filter fabric shall meet shall meet the requirements outlined in Georgia Department of Transportation Specification Section 881.2.05. Grasses used in filter strips shall be tolerant of both wet and dry conditions and meet the requirements outlined in Georgia Department of Transportation Specification Section 700.

7. **Signage**
   Install signage per the details and locations specified in the plans.

**B. Bioslopes**

Complete bioslopes as shown in the construction Plans, or as modified by the Engineer, after final grade and stabilization of the area upstream of each bioslope is reached. If this is not feasible, stormwater flow shall be diverted around the bioslope and the bioslope protected with temporary erosion and sediment control measures. Contractor shall maintain the bioslopes after construction as outlined in the GDOT Stormwater System Inspection and Maintenance Manual until the project is turned over.

1. **Excavation**
   Excavation should be limited to the width and length of bioslope per the details shown in the plans or as directed by the Engineer. Avoid placing excavated material near the open trench so as not to jeopardize the stability of the trench sidewalls. The bottom of the excavated trench should be flat across its width and length, shall not be loaded in a way that causes soil compaction, and should be scarified prior to placement of specified materials. The sides of the trench shall be trimmed of all large roots. Sidewalls should be uniform with no voids and scarified prior to placement of materials for specified engineered drainage layers. Trench sidewalks shall be lined with the specified filter fabric.

2. **Underdrain System/Aggregate Layer**
   Install underdrain system(s) made of perforated polyethylene or perforated PVC pipe at the locations and depth per details shown in the plans for conveyance of stormwater that has filtered through the media. Perforations shall be 3/8-inch diameter and spaced 6-inches on center with four rows running longitudinally. The underdrain pipe shall be...
surrounded by an aggregate layer of size No. 57 aggregate. Nonwoven geotextile filter fabric shall be used to protect the aggregate layer from the bioslope media mix. Aggregates used in underdrain systems shall be double washed and free of fines and organic materials. Cleanouts shall be provided at the end of each underdrain branch. Cleanouts shall extend to an elevation such that they are accessible once the trench is backfilled with the specified media and shall have a locking screw top lid to discourage vandalism and tampering.

3. **Bioslope Media Mix**
   a) The bioslope media mix shall contain aggregate, dolomite, gypsum, and perlite and shall be mixed as follows:

<table>
<thead>
<tr>
<th>Material</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aggregate:</td>
<td>3 yd³</td>
</tr>
<tr>
<td>GDOT size No. 89 stone</td>
<td>(3 yd³ used as a baseline for other mixture components: adjust total quantity based on bioslope dimensions)</td>
</tr>
<tr>
<td>No recycled material</td>
<td></td>
</tr>
<tr>
<td>Non-limestone material mineral aggregate</td>
<td></td>
</tr>
<tr>
<td>Perlite:</td>
<td>1 yd³ per 3 yd³ of mineral aggregate</td>
</tr>
<tr>
<td>Horticultural grade, free of toxic materials</td>
<td></td>
</tr>
<tr>
<td>99-100% passing US No. 4 Sieve</td>
<td></td>
</tr>
<tr>
<td>0-30% passing US No. 18 Sieve</td>
<td></td>
</tr>
<tr>
<td>0-10% passing US No. 30 Sieve</td>
<td></td>
</tr>
<tr>
<td>Dolomite: calcium magnesium carbonate, CaMg(CO₃)₂</td>
<td>40 pounds per yd³ of perlite</td>
</tr>
<tr>
<td>Agricultural grade, free of toxic materials</td>
<td></td>
</tr>
<tr>
<td>100% passing US No. 8 Sieve</td>
<td></td>
</tr>
<tr>
<td>0% passing US No. 16 Sieve</td>
<td></td>
</tr>
<tr>
<td>Gypsum: Non-calcined, agricultural gypsum CaSO₄•2H₂O</td>
<td>12 pounds per yd³ of perlite</td>
</tr>
<tr>
<td>(hydrated calcium sulfate)</td>
<td></td>
</tr>
<tr>
<td>Agricultural grade, free of toxic materials</td>
<td></td>
</tr>
<tr>
<td>100% passing US No. 8 Sieve</td>
<td></td>
</tr>
<tr>
<td>0% passing US No. 16 Sieve</td>
<td></td>
</tr>
</tbody>
</table>

b) Install the bioslope media mix specified above for the 12-inch-minimum-thickness bioslope media mix layer and nonwoven geotextile filter fabric per the details shown in the plans. Protect the bioslope media mix from contamination by foreign matter during installation. If the bioslope media mix becomes contaminated or the filter fabric is damaged, remove contaminated or damaged materials and replace them at no additional cost to the Department.

c) Cover the bioslope media mix with turf reinforcement matting 1 (TRM 1). Or as directed by the Engineer.

4. **Engineered Topsoil Application**
   1. The top 3 inches of the bioslope should consist of engineered topsoil. Use engineered topsoil that meets the requirements of Subsection 893.2.08. Do not use a mixture that contains deleterious substances. Obtain the materials from sources approved by the Engineer. Ensure that aggregate retained on No. 10 (2 mm) sieve is of hard, durable particles.

   2. Stabilize the disturbed area adjacent to the bioslope per the plans immediately after the bioslope is installed. Permanent vegetation using grass cover shall be established within the bioslope surface area using sod.

5. **Sod Layer**
The sod layer must be grown in primarily sand/sandy-loam soils with less than 6% clay content. Sod shall be half cut or thin cut to promote infiltration. Sod shall consist of at least 75% of the designated grass species specified in the plans.

6. Pretreatment
   Install filter strips per the details and locations specified in the plans. Grasses used in filter strips shall be tolerant of both wet and dry conditions and meet the requirements outlined in Georgia Department of Transportation Specification Section 700.

7. Signage
   Install signage per the details and locations specified in the plans.

C. Dry Detention Basins
   Construct dry detention basins per the plans at the required locations, or as modified by the Engineer. Construct the basins complete as shown, including but not limited to: grading, drainage, accessories to complete the dry detention basins and temporary mulching and permanent grassing on external slopes. The contractor may propose alternate construction staging for review and approval. Alternate construction submittals for review shall be provided a minimum of 30 days prior to the construction of a dry detention basin. Contractor shall maintain the dry detention basin after construction as outlined in the GDOT Stormwater System Inspection and Maintenance Manual until the project is turned over.

   1. Excavation
      Excavation should be limited to the width and length of the dry detention basin per the details shown in the plans or as directed by the Engineer. Embankments shall be constructed using the materials and methods specified in Section 208 and shall be compacted to at least 95 percent of the maximum laboratory dry density. Stabilize the disturbed areas adjacent to dry detention basins per the plans immediately after each dry detention basin is installed.

   2. Pretreatment
      Install rip rap forebays per the details and at the locations specified in the plans. Rip rap used in forebays shall meet the requirements outlined in Georgia Department of Transportation Specification Sections 603 and 805 and woven filter fabric shall meet the requirements outlined in Georgia Department of Transportation Specification Section 881.2.05.

   3. Signage
      Install signage per the details and locations specified in the plans.

D. Enhanced Dry Swales
   Construct enhanced dry swales as shown in the Plans, or as modified by the Engineer, after final grade and stabilization of the area upstream of each enhanced dry swale is reached. If this is not feasible, stormwater flow shall be diverted around the swale and the swale protected with temporary erosion and sediment control measures. Contractor shall maintain the enhanced dry swale after construction as outlined in the GDOT Stormwater System Inspection and Maintenance Manual until the project is turned over.

   1. Excavation
      Excavation should be limited to the width and length of the enhanced dry swale per the details shown in the plans or as directed by the Engineer. Avoid placing excavated material near the open trench so as not to jeopardize the stability of the trench sidewalls. The bottom of the excavated trench shall not be loaded in a way that causes soil compaction, and should be scarified prior to placement of specified materials. The sides of the trench shall be trimmed of all large roots. Sidewalls should be uniform with no voids and scarified prior to placement of materials for specified engineered drainage layers. Trench sidewalls shall be lined with the specified filter fabric. Infiltration testing should be performed prior to excavation of the dry enhanced swale if the enhanced dry swale is designed for infiltration. If infiltration is feasible, a second infiltration test is required prior to the placement of the underdrain system/aggregate layer to ensure that infiltration rates weren’t impacted during excavation.

   2. Underdrain System/Aggregate Layer
Install underdrain system(s) made of perforated polyethylene or perforated PVC pipe at the locations and depth per details shown in the plans for conveyance of stormwater that has filtered through the media. Perforations shall be 3/8-inch diameter and spaced 6-inches on center with four rows running longitudinally. A removable end cap connected to the underdrain system shall be installed per the details shown in the plans. If infiltration is feasible, the end cap shall be closed except for emergency drainage or maintenance purposes. The underdrain pipe shall be surrounded by an aggregate layer as defined in the details and a 2-3-inch filter blanket of size No. 89 aggregate (Georgia Department of Transportation Specification Section 800) shall be used to segregate the aggregate layer from the engineered soil mix. Aggregates used in underdrain systems shall be double washed and free of fines and organic materials. Cleanouts shall be provided at the end of each underdrain branch. Cleanouts shall extend to an elevation such that they are accessible once the trench is backfilled with the specified media and shall have a locking screw top lid, to discourage vandalism and tampering.

3. **Engineered Soil Mix**
   
   Install the engineered soil mix specified above for the 30-inch thick engineered soil mix and nonwoven geotextile filter fabric per the details shown in the plans. The engineered soil mix shall be placed in a maximum of 12-inch lifts and shall be protected from contamination by foreign matter during installation. If the engineered soil mix becomes contaminated or the filter fabric is damaged, remove contaminated or damaged materials and replace them at no additional cost to the Department. Avoid using heavy equipment on the basin area during installation to maintain hydraulic conductivity of the engineered soil mix and to prevent damage to the underdrains.

4. **Sod Layer**
   
   The sod layer must be grown in primarily sand/sandy-loam soils with a clay content of 10% or less. Sod shall be half cut or thin cut to promote infiltration. Sod shall consist of at least 75% of the designated grass species specified in the plans.

5. **Pretreatment**
   
   Install rip rap forebays per the details and at the locations specified in the plans. Rip rap used in forebays shall meet the requirements outlined in Georgia Department of Transportation Specification Sections 603 and 805 and woven filter fabric shall meet the requirements outlined in Georgia Department of Transportation Specification Section 881.2.05. Rip rap forebays shall be located at major inflow locations and energy dissipation shall be provided at all concentrated inflow locations. Maintenance access shall be provided to the forebay.

6. **Signage**
   
   Install signage per the details and locations specified in the plans.

E. **Enhanced Wet Swales**

Construct enhanced wet swales as shown in the Plans, or as modified by the Engineer, after final grade and stabilization of the area upstream of each enhanced wet swale is reached. If this is not feasible, stormwater flow shall be diverted around the swale and the swale protected with temporary erosion and sediment control measures. Contractor shall maintain the enhanced wet swale after construction as outlined in the GDOT Stormwater System Inspection and Maintenance Manual until the project is turned over.

1. **Excavation**
   
   Excavation should be limited to the width and length of enhanced wet swale per the details shown in the plans or as directed by the Engineer. Avoid placing excavated material near the open trench so as not to jeopardize the stability of the trench sidewalls. The bottom of the excavated trench shall not be loaded in a way that causes soil compaction, and should be scarified. The sides of the trench shall be trimmed of all large roots, uniform with no voids, and scarified during normal stage construction. Install matted permanent grass slopes adjacent to enhanced wet swales immediately after each enhanced wet swale is installed. Once the basin has been stabilized, vegetation shall be established within the enhanced wet swale per the details shown in the plans.

2. **Plantings**
   
   Plant species used in enhanced wet swale shall be installed per the details shown in the plans and meet the requirements outlined in Georgia Department of Transportation Specification Section 702. Plants shall be selected on the basis of a specified hydric tolerance zone and shall be capable of surviving wetland conditions. All plants used shall be well grown and healthy and free from disease and infestation by invasive species.

3. **Pretreatment**
Install rip rap forebays per the details and at the locations specified in the plans. Rip rap used in forebays shall meet the requirements outlined in Georgia Department of Transportation Specification Sections 603 and 805 and woven filter fabric shall meet the requirements outlined in Georgia Department of Transportation Specification Section 881.2.05.

4. **Signage**

Install signage per the details and locations specified in the plans.

**F. Infiltration Trenches**

Construct infiltration trenches as shown in the Plans, or as modified by the Engineer, only after final grade and stabilization of drainage areas upstream of the infiltration trenches are completed to prevent contamination. If this is not feasible, stormwater flow shall be diverted around the trench and the trench area protected with temporary erosion and sediment control measures. Contractor shall maintain the infiltration trench after construction as outlined in the GDOT Stormwater System Inspection and Maintenance Manual until the project is turned over.

1. **Excavation**

Excavation should be limited to the width and length of infiltration trench per the details shown in the plans or as directed by the Engineer. A void placing excavated material near the open trench so as not to jeopardize the stability of the trench sidewalls. The bottom of the excavated trench should be flat across its width and length, shall not be loaded in a way that causes soil compaction, and should be scarified prior to placement of specified materials. The sides of the trench shall be trimmed of all large roots. The sidewalls should be uniform with no voids and scarified prior to placement of materials for specified engineered drainage layers. Trench sidewalls shall be lined with specified filter fabric. Infiltration testing is required before excavation and prior to placement of the drainage layer to ensure that infiltration rates were not impacted during excavation and that the in-situ soils have a minimum infiltration rate of 0.7 in/hr (5.0x10^-4 cm/s).

2. **Observation Wells**

Install observation wells made of 2-inch diameter, 0.01-inch-slotted, threaded, schedule 40 PVC pipe at the locations and depth per details shown in the plans for percolation monitoring. Observation wells shall have a threaded or slip-on top cap and shall have a locking steel sleeve to discourage vandalism and tampering.

3. **Drainage Layer**

Install the specified materials for drainage layers and filter fabric per the details shown in the plans. The bottom 6 inches of the drainage layer shall consist of size 10 NS sand (Georgia Department of Transportation Specification Section 801). The drainage layers shall consist of size No. 3 drainage aggregate to the depth specified in the plans and filter fabric shall be used to segregate the aggregate layer from the pea gravel/sod layer. All aggregates used in drainage layers shall be double washed and free of fines and organic materials. Protect drainage layers from contamination by foreign matter during installation. If drainage layers become contaminated or filter fabric is damaged, remove contaminated or damaged materials and replace them at no additional cost to the Department.

4. **Pea Gravel/Sod Layer**

The top 2 inches of the trenches shall consist of pea gravel topped with sod as specified in the plans. Pea gravel shall be of either size No. 89 or size No. 9 aggregate (Georgia Department of Transportation Specification Section 800). Sod must be washed or grown in primarily sand/sandy-loams soils with 10% or less clay content. Stabilize the disturbed areas adjacent to infiltration trenches per the plans immediately after each infiltration trench is installed.

5. **Pretreatment**

Install rip rap forebays, filter strips, level spreaders and other pretreatment devices per the details and at the locations specified in the plans. Rip rap used in pretreatment devices shall meet the requirements outlined in Georgia Department of Transportation Specification Sections 603 and 805 and woven filter fabric shall meet the requirements outlined in Georgia Department of Transportation Specification Section 881.2.05. Grasses used in filter strips shall be tolerant of both wet and dry conditions and meet the requirements outlined in Georgia Department of Transportation Specification Section 700.

6. **Signage**

Install signage per the details and locations specified in the plans.

**G. Sand Filters**

Construct sand filters as shown in the Plans or as modified by the Engineer, after final grade and stabilization of the area upstream of each sand filter is reached. If this is not feasible, stormwater flow shall be diverted around the sand filter and the area shall be protected with temporary erosion and sediment control measures. Contractor shall maintain the sand filter after construction as outlined in the GDOT Stormwater System Inspection and Maintenance Manual until the project is turned over.
1. **Excavation**
   Excavation should be limited to the width and length of the sand filter per the details shown in the plans or as directed by the Engineer. Avoid placing excavated material near the open trench so as not to jeopardize the stability of the trench sidewalls. The bottom of the excavated trench should be flat across its width and length, shall not be loaded in a way that causes soil compaction, and should be scarified prior to placement of specified materials. The sides of the trench shall be trimmed of all large roots. The sidewalls should be uniform with no voids and scarified prior to placement of materials for specified engineered drainage layers. Trench sidewalls shall be lined with the specified filter fabric.

2. **Underdrain System/Aggregate Layer**
   Install underdrain system(s) made of perforated polyethylene or perforated PVC pipe at the locations and depth per details shown in the plans for conveyance of stormwater that has filtered through the media. Perforations are shall be 3/8-inch diameter and spaced 6-inches on center with four rows running longitudinally. The underdrain pipes shall be surrounded by an aggregate layer as defined in the details. Nonwoven geotextile filter fabric shall be used to segregate the aggregate layer from the sand filter bed. Aggregates used in underdrain systems shall be double washed and free of fines and organic materials. Cleanouts shall be provided at the end of each underdrain branch. Cleanouts shall extend to an elevation such that they are accessible once the trench is backfilled with the specified media and shall have a locking and threaded top lid to discourage vandalism and tampering.

3. **Sand Filter Bed**
   Install the sand filter bed consisting of size 10 NS sand (Georgia Department of Transportation Specification Section 801) for the 18-inch-minimum-thickness sand filter bed layer and nonwoven geotextile filter fabric per the details shown in Plans. The sand filter bed shall be placed in 6-inch lifts and shall be protected from contamination by foreign matter during installation. If the sand filter bed becomes contaminated or the filter fabric is damaged, remove contaminated or damaged materials and replace them at no additional cost to the Department. Avoid using heavy equipment on the filter bed to maintain hydraulic conductivity of the soil media and avoid damaging the underdrains.

4. **Engineered Topsoil Requirements**
   1. The top 4 inches of the sand filter should consist of engineered topsoil. Use engineered topsoil that meets the requirements Subsection 893.2.08. Do not use a mixture that contains deleterious substances. Obtain the materials from sources approved by the Engineer. Ensure that aggregate retained on No. 10 (2 mm) sieve is of hard, durable particles.
   2. Nonwoven geotextile filter fabric shall be installed between the engineered topsoil and sand filter bed and shall be readily separable for maintenance. Stabilize the disturbed area adjacent to the sand filter per plans immediately after the sand filter is installed. Permanent vegetation using grass cover shall be established within the sand filter using seeding once the basin has been stabilized. Grass used within the sand filter should be capable of withstanding frequent periods of wet and dry conditions.

5. **Pretreatment-Sediment Chamber**
   Rip rap used in sediment chambers shall meet the requirements outlined in Georgia Department of Transportation Specification Sections 603 and 805 and woven filter fabric shall meet the requirements outlined in Georgia Department of Transportation Specification Section 881.2.05.

6. **Signage**
   Install signage per the details and locations specified in the plans.

H. **Wet Detention Ponds**
   Construct wet detention ponds per the Plans at the required locations or as modified by the Engineer. Construct the ponds complete as shown, including but not limited to: grading, drainage, accessories to complete the wet detention ponds and temporary mulching and permanent grassing on external slopes. The contractor may propose alternate construction staging for review and approval. Alternate construction submittals for review shall be provided a minimum of 30 days prior to construction of a wet detention pond. Contractor shall maintain the wet detention pond after construction as outlined in the GDOT Stormwater System Inspection and Maintenance Manual until the project is turned over.

1. **Excavation**
Excavation should be limited to the width and length of the wet detention pond per the details shown in the plans or as directed by the Engineer. Embankments shall be constructed using the materials and methods specified in Georgia Department of Transportation Specification Section 208 and shall be compacted to at least 95 percent of the maximum laboratory dry density. Infiltration testing shall be performed prior to excavation of the wet detention pond to determine if a permanent pool will be maintained. If infiltration test results show an infiltration rate greater than 1 inch/hour at the proposed wet detention pond invert, an impervious liner shall be approved by the Engineer for use. Install matted permanent grass slopes adjacent to wet detention ponds immediately after each wet detention pond is installed. Once the basin has been stabilized, vegetation shall be established within the wet detention pond per the details shown in the plans.

2. Liners
   1. If geotechnical testing confirms the need for a liner, acceptable options include one of the following and shall be approved by the Engineer for use: (a) six to 12 inches of clay soil that meets the specifications below, (b) a 30 mm poly-liner, (c) bentonite, (d) use of chemical additives, or (e) a design prepared by a professional engineer registered in the state of Georgia.

<table>
<thead>
<tr>
<th>Property</th>
<th>Test Method</th>
<th>Unit</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Permeability</td>
<td>ASTM D-2434</td>
<td>cm/sec</td>
<td>$1 \times 10^{-6}$</td>
</tr>
<tr>
<td>Plasticity Index of Clay</td>
<td>ASTM D-423/424</td>
<td>%</td>
<td>Not less than 15</td>
</tr>
<tr>
<td>Liquid Limit of Clay</td>
<td>ASTM D-2216</td>
<td>%</td>
<td>Not less than 30</td>
</tr>
<tr>
<td>Clay Particles Passing</td>
<td>ASTM D-422</td>
<td>%</td>
<td>Not less than 30</td>
</tr>
<tr>
<td>Clay Compaction</td>
<td>ASTM D-2216</td>
<td>%</td>
<td>95% of standard proctor density</td>
</tr>
</tbody>
</table>

2. For wet detention ponds designed to have a clay liner, 4” of topsoil shall be added to the top of the clay liner. The topsoil may be amended organic material in order to support plant growth depending on the soil analysis. If a geosynthetic liner is used to reduce exfiltration from the wet detention pond, a minimum of 1 foot of soil shall separate the geosynthetic liner from the planting surface.

3. Plantings
   Plant species used in wet detention ponds shall be installed per the details shown in the plans and meet the requirements outlined in Georgia Department of Transportation Specification Section 702. Vegetation surrounding the normal pool and along the safety bench shall be water tolerant wetland species and the remaining areas shall be planted with turf grass to prevent erosion. Woody vegetation shall not be planted on the embankment or 25 feet from the outlet structure. Plants shall be selected based on a specified hydric tolerance zone and all plants used shall be well grown and healthy and free from disease and infestation by invasive species.

3. Pretreatment
   Install rip rap forebays per the details and at the locations specified in the plans. Rip rap used in forebays shall meet the requirements outlined in Georgia Department of Transportation Specification Sections 603 and 805 and woven filter fabric shall meet the requirements outlined in Georgia Department of Transportation Specification Section 881.2.05.

4. Signage
   Install signage per the details and locations specified in the plans.

169.3.06 Quality Acceptance
   General Provisions 101 through 150.

169.3.07 Contractor Warranty and Maintenance
   General Provisions 101 through 150.

169.4 Measurement
   A. Bioretention Basins
      Bioretention basins are measured for payment by the entire basin constructed at each location complete in place and accepted. The outlet control structure, underdrain system, engineered soil mix, mulch, any pretreatment (e.g., forebay), any landscape plants, any signage, any outlet pipe, and any outlet apron and/or other energy dissipation devices are included in the cost of the bioretention basin.
B. Bioslopes

Permanent bioslopes are measured for payment by the entire bioslope complete in place and accepted. The outlet control structure, underdrain system, any outlet pipe, any pretreatment, any signage, and any outlet apron and/or other energy dissipation devices are included in the cost of the bioslope. Permanent grassing is not measured and paid for separately.

C. Dry Detention Basins

Dry detention basins are measured for payment by the entire structure constructed at each location complete in place and accepted. The outlet control structure, any outlet pipe, any pretreatment (e.g. forebay), any signage, and any outlet apron and/or other energy dissipation devices are included in the cost of the dry detention basin. Permanent grassing is not measured and paid for separately.

D. Enhanced Dry Swales

Enhanced dry swales are measured for payment by the entire structure constructed at each location complete in place and accepted. The outlet control structure, underdrain system, engineered soil mix, any pretreatment (e.g. forebay), any signage, any outlet pipe, and any outlet apron and/or other energy dissipation devices are included in the cost of the enhanced dry swale.

E. Enhanced Wet Swales

Enhanced wet swales are measured for payment by the entire structure constructed at each location complete in place and accepted. The outlet control structure, any outlet protection, any pretreatment (e.g. forebay), any landscape plants, any signage, and any outlet apron and/or other energy dissipation devices are included in the cost of the enhanced wet swale.

F. Infiltration Trenches

Infiltration trenches are measured for payment by the entire structure constructed at each location complete in place and accepted. Any pretreatment and any signage are included in the cost of the infiltration trench. Sod is not measured and paid for separately.

G. Sand filters

Sand filters are measured for payment by the entire structure constructed at each location complete in place and accepted. The outlet control structure, underdrain system, sand filter bed, sedimentation chamber, any signage, any outlet pipe, and any outlet apron or other energy dissipation devices are included in the cost of the sand filter.

H. Wet Detention Ponds

Wet detention ponds are measured for payment by the entire structure constructed at each location complete in place and accepted. The outlet control structure, any outlet pipe, any pretreatment (e.g. forebay), landscape plants, any signage, and any outlet apron and/or other energy dissipation devices are included in the cost of the wet detention pond. Permanent grassing is not measured and paid for separately.

169.4.01 Limits

General Provisions 101 through 150.

169.5 Payment

A. Bioretention Basins

Bioretention basins are paid for at the Contract Unit Price per each. The outlet control structure, any outlet pipe, any pretreatment (e.g. forebay), any landscape plants, any signage, and any outlet apron and/or other energy dissipation devices are paid for in the overall cost of the bioretention basin. Payment is full compensation for:

- Furnishing the material and labor
- Preparation and grading required to construct bioretention basins
- Installation of the drainage aggregate, nonwoven geotextile filter fabric, and complete underdrain systems as shown in the details for construction of bioretention basins
- Installation of the permeable engineered soil mix, and mulch, as shown in the details for construction of bioretention basins
- Installation of landscape plantings as shown in the plans for construction of bioretention basins
- Any other incidentals such as but not limited to pipe fittings and connections to other specified structures required to construct bioretention basins
B. Bioslopes
Bioslope drains are paid for at the Contract Unit Price per each. The outlet control structure, any outlet pipe, any pretreatment, any signage, and any outlet apron and/or other energy dissipation devices are paid for in the overall cost of the bioslope. Payment is full compensation for:

- Furnishing the material and labor
- Preparation and grading required to construct bioslopes
- Installation of the drainage aggregate, collector pipes, bioslope soil media, nonwoven geotextile filter fabric, and turf reinforcement matting 1, as shown in the details for construction of bioslope drains
- Any incidentals such as but not limited to pipe fittings and connections required to construct the bioslope

C. Dry Detention Basins
Dry detention basins are paid for at the Contract Unit Price per each. The outlet control structure, any outlet pipe, any pretreatment (e.g. forebay), any signage, and any outlet apron and/or other energy dissipation devices are paid for in the overall cost of the dry detention basin. Payment is full compensation for:

- Furnishing the material and labor
- Preparation and grading required to construct dry detention basins
- Any other incidentals such as but not limited to pipe fittings and connections to other specified structures required to construct dry detention basins

D. Enhanced Dry Swales
Enhanced dry swales are paid for at the Contract Unit Price per each. The outlet control structure, any outlet pipe, any pretreatment (e.g. forebay), any signage, and any outlet apron and/or other energy dissipation devices are paid for in the overall cost of the enhanced dry swale. Payment is full compensation for:

- Furnishing the material and labor
- Preparation and grading required to construct enhanced dry swales
- Installation of the drainage aggregate, nonwoven geotextile filter fabric, and complete underdrain systems as shown in the details for construction of enhanced dry swales
- Installation of the permeable engineered soil mix, and sod if required, as shown in the details for construction of enhanced dry swales
- Any other incidentals such as but not limited to pipe fittings and connections to other specified structures required to construct enhanced dry swales

E. Enhanced Wet Swales
Enhanced wet swales are paid for at the Contract Unit Price per each. The outlet control structure, any outlet pipe, any pretreatment (e.g. forebay), any landscape plants, any signage, and any outlet apron and/or other energy dissipation devices are paid for in the overall cost of the enhanced wet swale. Payment is full compensation for:

- Furnishing the material and labor
- Preparation and grading required to construct enhanced wet swales
- Installation of landscape plantings as shown in the plans for construction of enhanced wet swales
- Any other incidentals such as but not limited to pipe fittings and connections to other specified structures required to construct enhanced wet swales

F. Infiltration Trenches
Infiltration trenches are paid for at the Contract Unit Price per each. Any pretreatment and any signage are paid for in the overall cost of the infiltration trench. Payment is full compensation for:

- Furnishing the material and labor
- Preparation and grading required to construct infiltration trenches
- Installation of the drainage aggregate, nonwoven geotextile filter fabric, and observation wells as shown in the details for construction of infiltration trenches
- Installation of the sod as shown in the details for construction of infiltration trenches
• Any other incidentals such as but not limited to pipe fittings and connections to other specified structures required to construct infiltration trenches

G. Sand Filters
Sand filters are paid for at the Contract Unit Price per each. The outlet control structure, the sedimentation chamber, any outlet pipe, any signage, and any outlet apron and/or other energy dissipation devices are paid for in the overall cost of the sand filter. Payment is full compensation for:

• Furnishing the material and labor
• Preparation and grading required to construct sand filters
• Installation of the drainage aggregate, nonwoven geotextile filter fabric, 10 NS sand, and complete underdrain system as shown in the details for construction of sand filters
• Installation of the permeable topsoil as shown in the details for construction of sand filters
• Any other incidentals such as but not limited to pipe fittings and connections to other specified structures required to construct sand filters.

H. Wet Detention Ponds
Wet detention ponds are paid for at the Contract Unit Price per each. The outlet control structure, any outlet pipe, any pretreatment (e.g. forebay), any landscape plants, any signage, and any outlet apron and/or other energy dissipation devices are paid for in the overall cost of the wet detention pond. Payment is full compensation for:

• Furnishing the material and labor
• Preparation and grading required to construct wet detention ponds
• Installation of landscape plantings as shown in the plans for construction of wet detention ponds

Any other incidentals such as but not limited to pipe fittings and connections to other specified structures required to construct wet detention ponds

Payment is made under:

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Description</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>169.5</td>
<td>Construct bioretention basin</td>
<td>Per each</td>
</tr>
<tr>
<td>169.6</td>
<td>Construct bioslope</td>
<td>Per each</td>
</tr>
<tr>
<td>169.6</td>
<td>Construct dry detention basin</td>
<td>Per each</td>
</tr>
<tr>
<td>169.6</td>
<td>Construct enhanced dry swale</td>
<td>Per each</td>
</tr>
<tr>
<td>169.6</td>
<td>Construct enhanced wet swale</td>
<td>Per each</td>
</tr>
<tr>
<td>169.6</td>
<td>Construct infiltration trench</td>
<td>Per each</td>
</tr>
<tr>
<td>169.6</td>
<td>Construction sand filter</td>
<td>Per each</td>
</tr>
<tr>
<td>169.6</td>
<td>Construct wet detention pond</td>
<td>Per each</td>
</tr>
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</table>

169.5.01 Adjustments
General Provisions 101 through 150.

169.6 As-Built Documents

169.6.01 Description
Arrange for the inspection of post-construction stormwater BMPs during construction activities as specified and submit post-construction stormwater BMP as-built documents to the Department within 45 calendar days prior to substantial completion of the Contract.

169.6.02 Construction
Submit to the Department within 45 calendar days of completing construction of all post-construction stormwater BMPs in the Contract post-construction stormwater BMP as-built documents that contain the specified information for each post-construction stormwater BMP constructed. Submit two hard copies and one digital copy in PDF format. All post-construction stormwater BMPs shall meet the construction tolerances outlined in Georgia Department of Transportation specification 169.6.03 and will require approval from construction engineering and inspection personnel.
The post-construction stormwater BMP as-built documents include the following content, neatly presented and organized in an easy-to-follow format, for each post-construction stormwater BMP in the Contract.

A. Red line revision data must be overlaid on the appropriate Contract Plan sheet(s). Red line revision data must be red in color, clearly legible, and easily distinguishable. Printed copies must be submitted on 11 in. X 17 in. sheets.

B. Applicable supporting computations demonstrating that the functionality of the post-construction stormwater BMP meets the approved design requirements as noted in the approved Post-Construction Stormwater Management (PCS) Report for the Contract. Include any necessary revisions to the final PCS Report.

Upon written request, the Department will provide CADD files in DGN format for the approved plans and a copy of the PCS Report in PDF format to facilitate completion of the post-construction stormwater BMP as-built documents.

169.6.03 Construction Tolerances
Construction tolerances for post-construction stormwater BMPs shall be as follows.

A. Depths: Depths shall be within 5% of the depths specified in the Contract Documents.

B. Water Quality and Channel Protection Volumes:
   - Measurement of Water Quality volume and Channel Protection volume shall be within 5% of the volumes specified in the Contract Documents.
   - Outlet structure orifices and weirs shall be within 3/16 inch of the Contract Documents.

C. Dimensions:
   - Length of bioslopes, enhanced dry/wet swales, grass channels, infiltration trenches, and filter strips shall be within 5% of the length specified in the Contract Documents not to exceed 10 feet.
   - Width of infiltration trenches and filter strips shall be within 5% of the width specified in the Contract Documents.
   - Surface area for bioretention basins and sand filters shall be within 5% of the surface area specified in the Contract Documents.
   - In lieu of measuring length and width and depth of a post construction structure the average end area method for calculating volume can be used to calculate of post construction structures that have an irregular shape. The accepted tolerance of the difference between the volume measured and the volume derived from the contract documents shall be 10%.

169.6.04 Payment
Post-construction stormwater BMP as-built documents will be paid for at the contract unit price per each. The payment will be full compensation for services of the professional engineer, and for all material, labor, equipment, tools, and incidentals necessary to complete the work.

Subsequent inspections and reconstructed post-construction stormwater BMPs because of failure to address deviations from the Contract Documents that exceed specified tolerances and do not meet the design functions as presented in the approved final PCS Report shall be at no additional cost to the Department.

Subsequent revisions to and submissions of the post-construction stormwater BMP as-built documents following the initial submission shall be at no additional cost to the Department.
IN WITNESS WHEREOF, the Parties, intending to be legally bound, have executed this Agreement, including the requirements of the DB Documents, as of the date first above written.

Superior Construction Company Southeast, LLC  

By: Peter Kelley  
Name: President  
Title:  

GEORGIA DEPARTMENT OF TRANSPORTATION  

By: Russell R. McMurry, P.E.  
Name: Commissioner  
Title:  

Attested By: Angela O. Whitworth  
Name: Treasurer  
Title:
EXECUTED IN DUPLICATE

DEPARTMENT OF TRANSPORTATION
PERFORMANCE, PAYMENT, AND NONRESIDENT
CONTRACTOR'S TAX BONDS
(NONRESIDENT CONTRACTOR)

KNOW ALL MEN BY THESE PRESENTS, THAT WE,
SUPERIOR CONSTRUCTION COMPANY SOUTHEAST - FL

as Principal, and the Corporation or Corporations hereinafter designated as Surety A or Surety B to Surety N/A inclusive, as Surety or Sureties, are held and firmly bound, both "jointly and severally" as well as "severally" only, unto the Department of Transportation in the penal sum of 120% of the Original Contract Amount of:

SEVEN MILLION NINE HUNDRED THIRTY-EIGHT THOUSAND ONE HUNDRED SEVENTY DOLLARS AND ZERO CENTS
$71,938,170.00

for the use of the obligee herein named and of all persons doing work or furnishing skill, tools, machinery, or materials under or for the purpose of this contract hereinafter described, and for the use of the State and all political subdivisions thereof for all taxes (including contributions due under the employment security law), together with penalties and interest collectible as taxes, which may accrue during the period of this bond on account of the execution and performance of this contract hereinafter described; Provided, that it is mutually understood and agreed between the Principal and Surety and/or Sureties and the obligee herein named that this bond is to be construed as being in compliance with and subject to the provisions of Sections 13-10-1, 36-82-101, and 48-13-50 through 48-13-38 of the Official Code of Georgia Annotated, as well as the other applicable provisions, and that in compliance with the aforesaid sections this instrument is intended and is to be construed as three separate bonds, namely, as a "performance bond" in the full penal sum heretofore set forth, and as a "payment bond", in the full penal sum heretofore named, and as a "tax bond" in the amount of ten percent of the full penal sum heretofore named and that all bonds shall be construed to be in full force and effect at the same time, as the case may be, and that the obligations shall be several as to each type of bond; and for the payment of which sums well and truly to be made we bind ourselves, our heirs, executors, administrators, and successors, jointly and severally, firmly by these presents. Provided, that the Sureties bind themselves in such sums "jointly and severally", as well as "severally" only for the purpose of allowing a joint action or actions against any or all of us, and for all other purposes each Surety binds itself, jointly and severally with the Principal, and with each other, for 210 percent of the penal sum of this bond, and provided further that, while each Surety binds itself, jointly and severally with the Principal, for 210 percent of penal sum herein provided for, the total liability of all Sureties shall not exceed the total penal sum heretofore provided for as to each of the respective obligations herein provided for.

Signed and sealed this day of December 21, 2018

Surety Name and State of Incorporation Name and Address of Georgia Resident Agent
A Continental Casualty Company Agent Name: Karina Pilis
an Illinois insurance company Agent Address: 3560 Lenox Road, Suite 2800
B Atlanta, GA 30326
C Agent Phone Number: 404-995-3500
D

*BVIOUS PRINT ALL INFORMATION*

Bond #: 30058431

Note: The Surety Company for Performance and Payment Bonds shall be a company acceptable as Surety on Federal Bonds and listed is the current Federal Register and licensed in the State of Georgia.
EXECUTED IN DUPLICATE

THE CONDITIONS OF THE FOREGOING OBLIGATIONS is such that whereas the above named Principal has entered into a contract with said department of Transportation bearing even date herewith for the Construction of:

I-20 OVER SAVANNAH RIVER BRIDGE REPLACEMENT AND WIDENING, RICHMOND COUNTY GA AND AIKEN COUNTY SOUTH CAROLINA

The surety hereby binds itself to provide performance bond and payment bond for work added by Supplemental Agreement(s) and/or Extension Agreement(s), whereby the original Contract amount or the total Project length may be increased by as much as twenty (20) percent without the written assent of the Surety.

Now, therefore, the condition of these obligations is such that if the above named bound Principal shall in all respects comply with the terms and conditions of said contract, including all modifications or extensions thereof, and his obligations thereunder, including the notice to contractors, the plans, general conditions, specifications, special provisions and proposals, herein referred to and made a part thereof, and shall complete the said contract in accordance with its terms and shall save obligee free from all cost and charge that may accrue on account of the doing of the work specified, then this bond, construed as a "performance bond" shall be void, otherwise of full force and effect.

Provided further, that upon the failure of the said Principal to promptly and efficiently prosecute said work, in any respect, in accordance with the contract, the above bound Surety or Sureties shall take charge of said work and complete the contracts at its own expense, pursuant to its terms, receiving, however, any balance of funds in the hands of said Department of Transportation under said contract.

And, further, the condition of these obligations is such that if the above bound Principal shall make prompt payment to all subcontractors and all other persons supplying labor, materials, machinery and equipment furnished for the performance of the work provided for in said contract, as well as all duly authorized modifications thereof which may hereafter be made, including any extension of time to complete the same, then this bond, as a "payment bond", shall be void, otherwise of full force and effect.

It is agreed that, in the event that this bond is executed by more than one surety company, the term "Surety" as used in this bond shall be construed to mean any one or all of such surety companies executing this bond. It is further agreed that such surety companies herein named and executing this bond as surety for the Principal, by mutual agreement between themselves, and with the Principal, and with the obligee herein named, do hereby designate and authorize:

N/A

as the "controlling surety".
EXECUTED IN DUPLICATE

It is further agreed that the term, "controlling surety", shall be defined as that one of such sureties herein designated and authorized by all of such sureties, upon whom any notice or other demand may be made by the obligee herein named, or other person having a claim against the Principal under the provisions of this bond, or with whom such obligee, or other such person, may negotiate or deal as to any matter pertaining to the obligations of this bond, and against whom any right of action growing out of this bond may be enforced, as provided for by Sections 38-82-102 through 38-82-105 of the Official Code of Georgia Annotated as fully and effectively as though the same were had or done with each of such named sureties individually, and with the right upon the part of such "controlling surety" to vouch such co-sureties into court to defend any action against it or them arising out of the obligations of this bond, as provided by Section 9:10:13 of the Official Code of Georgia Annotated, or to call upon such co-sureties, in accordance with the terms of any notice, demand, suit, suit at law, or other action, commenced or brought against it by the obligee named herein, or any other person having a claim against the Principal under the conditions and provisions of this bond, or in accordance with any private contract between the sureties executing this bond on behalf of said Principal, it being the purpose and intent of this contract that the obligee named in this bond, or such other person having a claim under the provisions of this bond, may enforce any right that it or they may have growing out of this bond by notice, demand, negotiation, suit, or other appropriate action against the controlling surety only, and such action shall be deemed to be binding upon all the sureties named herein; provided however, the foregoing notwithstanding, the obligee, or such other person having a claim under this bond, at its or their option, may take such action against any or all of said surety companies.

It is agreed by the parties hereto that in the event the Department of Transportation in making the contract with the Principal herein shall be acting as Agent for the United States Government, or for the RICHMOND COUNTY, GEORGIA,

or for both, as well as for itself, then the said Department of Transportation shall have the right in the event of a breach of the contract resulting in loss to the said County or to the United States Government; or to itself, to maintain a suit hereon for the use of itself, or the United States Government, or said County as well as for itself; or said County and said United States Government shall have the right in their own names to maintain a suit herein in the same manner and to the same extent as the Department of Transportation has by virtue of Sections 38-82-104 and 38-82-105 of the Official Code of Georgia Annotated.
IN WITNESS WHEREOF, the said "Authorized Signer" and the said "Surety" have duly executed this bond under seal this date December 21, 2018.

Signed, Sealed, and Delivered in the presence of us.

IN WITNESS WHEREOF THE PARTIES HAVE SET THEIR HANDS AND AFFIXED THEIR SEALS

SUPERIOR CONSTRUCTION COMPANY SOUTHEAST  

Signature of Contractor (SEAL)

Curtis E. Long, Manager

Printed Name of Signee:

CONTINENTAL CASUALTY COMPANY  

Signature of Attorney-In-Fact & Georgia Resident Agent (SEAL)

John K. Johnson

Printed Name of Signee: John K. Johnson, Attorney-In-Fact

Karina Plis

Georgia Resident Agent: Karina Plis, License # 3065536 (Required for Non-Resident Contractor)
STATE OF ILLINOIS  
COUNTY OF COOK

I, ______ C.R. Hernandez ________, a Notary Public in and for said County do hereby certify that _______ John K. Johnson ________ Attorney-in-Fact, of these:

<table>
<thead>
<tr>
<th>Company Name</th>
<th>Corporation Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Continental Casualty Company</td>
<td>An Illinois Corporation</td>
</tr>
<tr>
<td>American Casualty Company of Reading Pennsylvania</td>
<td>A Pennsylvania Corporation</td>
</tr>
<tr>
<td>National Fire Insurance Company of Hartford</td>
<td>A Connecticut Corporation</td>
</tr>
<tr>
<td>Western Surety Company</td>
<td>A South Dakota Corporation</td>
</tr>
<tr>
<td>The Continental Insurance Company</td>
<td>A Pennsylvania Corporation</td>
</tr>
</tbody>
</table>

who is personally known to me to be the same person whose name is subscribed to the foregoing instrument appeared before me this day in person, and, acknowledged that they signed, sealed, and delivered said instrument for and on behalf of:

<table>
<thead>
<tr>
<th>Company Name</th>
<th>Corporation Type</th>
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</thead>
<tbody>
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<td>A South Dakota Corporation</td>
</tr>
<tr>
<td>The Continental Insurance Company</td>
<td>A Pennsylvania Corporation</td>
</tr>
</tbody>
</table>

for the uses and purposed therein set forth.

Given under my hand and notarial seal at my office in the City of __Chicago__ in said County, this __21st__ day of __December__ A.D. __2018__.

__________________________
Notary Public
POWER OF ATTORNEY APPOINTING INDIVIDUAL ATTORNEY-IN-FACT

Know All Men By These Presents, That Continental Casualty Company, an Illinois insurance company, National Fire Insurance Company of Hartford, an Illinois insurance company, and American Casualty Company of Reading, Pennsylvania, a Pennsylvania insurance company (herein called "the CNA Companies"), are duly organized and existing insurance companies having their principal offices in the City of Chicago, and State of Illinois, and that they do by virtue of the signatures and seals herein affixed hereby make, constitute and appoint


of Chicago, IL, their true and lawful Attorney(s)-in-Fact with full power and authority hereby conferred to sign, seal and execute for and on their behalf bonds, undertakings and other obligatory instruments of similar nature

- In Unlimited Amounts -

and to bind them thereby as fully and to the same extent as if such instruments were signed by a duly authorized officer of their insurance companies and all the acts of said Attorney, pursuant to the authority hereby given is hereby ratified and confirmed.

This Power of Attorney is made and executed pursuant to and by authority of the By-Law and Resolutions, printed on the reverse hereto, duly adopted, as indicated, by the Boards of Directors of the insurance companies.

In Witness Whereof, the CNA Companies have caused these presents to be signed by their Vice President and their corporate seals to be hereto affixed on this 27th day of February, 2017.

State of South Dakota, County of Minnehaha, ss:
On this 27th day of February, 2017 before me personally came Paul T. Bruflat to me known, who, being by me duly sworn, did depose and say: that he resides in the City of Sioux Falls, State of South Dakota; that he is a Vice President of Continental Casualty Company, an Illinois insurance company, National Fire Insurance Company of Hartford, an Illinois insurance company, and American Casualty Company of Reading, Pennsylvania, a Pennsylvania insurance company described in and which executed the above instrument; that he knows the seals of said insurance companies; that the seals affixed to the said instrument are such corporate seals; that they were so affixed pursuant to authority given by the Boards of Directors of said insurance companies and that he signed his name thereto pursuant to like authority, and acknowledges same to be the act and deed of said insurance companies.

My Commission Expires June 23, 2021

Certificate

J. Mohr
Notary Public

I, D. Bult, Assistant Secretary of Continental Casualty Company, an Illinois insurance company, National Fire Insurance Company of Hartford, an Illinois insurance company, and American Casualty Company of Reading, Pennsylvania, a Pennsylvania insurance company do hereby certify that the Power of Attorney herein above set forth is still in force, and further certify that the By-Law and Resolution of the Board of Directors of the insurance companies printed on the reverse hereof is still in force. In testimony whereof I have hereunto subscribed my name and affixed the seal of the said insurance companies this 1213 day of December 2018.

D. Bult
Assistant Secretary

Form F6853-4/2012
Authorizing By-Laws and Resolutions

ADOPTED BY THE BOARD OF DIRECTORS OF CONTINENTAL CASUALTY COMPANY:

This Power of Attorney is made and executed pursuant to and by authority of the following resolution duly adopted by the Board of Directors of the Company at a meeting held on May 12, 1995:

"RESOLVED: That any Senior or Group Vice President may authorize an officer to sign specific documents, agreements and instruments on behalf of the Company provided that the name of such authorized officer and a description of the documents, agreements or instruments that such officer may sign will be provided in writing by the Senior or Group Vice President to the Secretary of the Company prior to such execution becoming effective."

This Power of Attorney is signed by Paul T. Bruflat, Vice President, who has been authorized pursuant to the above resolution to execute power of attorneys on behalf of Continental Casualty Company.

This Power of Attorney is signed and sealed by facsimile under and by the authority of the following Resolution adopted by the Board of Directors of the Company by unanimous written consent dated the 25th day of April, 2012:

"Whereas, the bylaws of the Company or specific resolution of the Board of Directors has authorized various officers (the “Authorized Officers”) to execute various policies, bonds, undertakings and other obligatory instruments of like nature; and

Whereas, from time to time, the signature of the Authorized Officers, in addition to being provided in original, hard copy format, may be provided via facsimile or otherwise in an electronic format (collectively, “Electronic Signatures”); Now therefore be it resolved: that the Electronic Signature of any Authorized Officer shall be valid and binding on the Company."

ADOPTED BY THE BOARD OF DIRECTORS OF NATIONAL FIRE INSURANCE COMPANY OF HARTFORD:

This Power of Attorney is made and executed pursuant to and by authority of the following resolution duly adopted by the Board of Directors of the Company by unanimous written consent dated May 10, 1995:

"RESOLVED: That any Senior or Group Vice President may authorize an officer to sign specific documents, agreements and instruments on behalf of the Company provided that the name of such authorized officer and a description of the documents, agreements or instruments that such officer may sign will be provided in writing by the Senior or Group Vice President to the Secretary of the Company prior to such execution becoming effective."

This Power of Attorney is signed by Paul T. Bruflat, Vice President, who has been authorized pursuant to the above resolution to execute power of attorneys on behalf of National Fire Insurance Company of Hartford.

This Power of Attorney is signed and sealed by facsimile under and by the authority of the following Resolution adopted by the Board of Directors of the Company by unanimous written consent dated the 25th day of April, 2012:

"Whereas, the bylaws of the Company or specific resolution of the Board of Directors has authorized various officers (the “Authorized Officers”) to execute various policies, bonds, undertakings and other obligatory instruments of like nature; and

Whereas, from time to time, the signature of the Authorized Officers, in addition to being provided in original, hard copy format, may be provided via facsimile or otherwise in an electronic format (collectively, “Electronic Signatures”); Now therefore be it resolved: that the Electronic Signature of any Authorized Officer shall be valid and binding on the Company."

ADOPTED BY THE BOARD OF DIRECTORS OF AMERICAN CASUALTY COMPANY OF READING, PENNSYLVANIA:

This Power of Attorney is made and executed pursuant to and by authority of the following resolution duly adopted by the Board of Directors of the Company by unanimous written consent dated May 10, 1995:

"RESOLVED: That any Senior or Group Vice President may authorize an officer to sign specific documents, agreements and instruments on behalf of the Company provided that the name of such authorized officer and a description of the documents, agreements or instruments that such officer may sign will be provided in writing by the Senior or Group Vice President to the Secretary of the Company prior to such execution becoming effective."

This Power of Attorney is signed by Paul T. Bruflat, Vice President, who has been authorized pursuant to the above resolution to execute power of attorneys on behalf of American Casualty Company of Reading, Pennsylvania.

This Power of Attorney is signed and sealed by facsimile under and by the authority of the following Resolution adopted by the Board of Directors of the Company by unanimous written consent dated the 25th day of April, 2012:

"Whereas, the bylaws of the Company or specific resolution of the Board of Directors has authorized various officers (the “Authorized Officers”) to execute various policies, bonds, undertakings and other obligatory instruments of like nature; and

Whereas, from time to time, the signature of the Authorized Officers, in addition to being provided in original, hard copy format, may be provided via facsimile or otherwise in an electronic format (collectively, “Electronic Signatures”); Now therefore be it resolved: that the Electronic Signature of any Authorized Officer shall be valid and binding on the Company."
**Certificate Of Completion**

Envelope Id: 4467E8071BA64BC196A2EF2B7D2824E6
Status: Completed
Subject: B1CBA1801645-0/SUPERIOR CONSTRUCTION COMPANY SOUTHEAST
Source Envelope:

| Document Pages: 1287 | Signatures: 3 | Envelope Originator: GDOT DocuSign Admin |
| Certificate Pages: 5 | Initials: 0 | IP Address: 143.100.55.13 |
| AutoNav: Enabled | | 600 W Peachtree St, NW |
| Envelopeld Stamping: Enabled | | Atlanta, GA 30308 |
| Time Zone: (UTC-05:00) Eastern Time (US & Canada) | | gdot_contracts@dot.ga.gov |

**Record Tracking**

Status: Original
12/7/2018 10:38:06 AM
Holder: GDOT DocuSign Admin
gdot_contracts@dot.ga.gov
Location: DocuSign

Security Appliance Status: Connected
Pool: StateLocal
Storage Appliance Status: Connected
Pool: Georgia Department of Transportation

**Signer Events**

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**Editor Delivery Events**

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**Agent Delivery Events**

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<table>
<thead>
<tr>
<th>Payment Events</th>
<th>Status</th>
<th>Timestamps</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electronic Record and Signature Disclosure</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
ELECTRONIC RECORD AND SIGNATURE DISCLOSURE

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How to contact Georgia Department of Transportation:
You may contact us to let us know of your changes as to how we may contact you electronically, to request paper copies of certain information from us, and to withdraw your prior consent to receive notices and disclosures electronically as follows:
To contact us by email send messages to: gdot_contracts@dot.ga.gov

To advise Georgia Department of Transportation of your new e-mail address
To let us know of a change in your e-mail address where we should send notices and disclosures electronically to you, you must send an email message to us at gdot_contracts@dot.ga.gov and in the body of such request you must state: your previous e-mail address, your new e-mail address. We do not require any other information from you to change your email address.
In addition, you must notify DocuSign, Inc to arrange for your new email address to be reflected in your DocuSign account by following the process for changing e-mail in DocuSign.

To request paper copies from Georgia Department of Transportation
To request delivery from us of paper copies of the notices and disclosures previously provided by us to you electronically, you must send us an e-mail to gdot_contracts@dot.ga.gov and in the body of such request you must state your e-mail address, full name, US Postal address, and telephone number. We will bill you for any fees at that time, if any.

To withdraw your consent with Georgia Department of Transportation
To inform us that you no longer want to receive future notices and disclosures in electronic format you may:
   i. decline to sign a document from within your DocuSign account, and on the subsequent page, select the check-box indicating you wish to withdraw your consent, or you may;
   ii. send us an e-mail to gdot_contracts@dot.ga.gov and in the body of such request you must state your e-mail, full name, IS Postal Address, telephone number, and account number. We do not need any other information from you to withdraw consent.
   The consequences of your withdrawing consent for online documents will be that transactions may take a longer time to process.

Required hardware and software

<table>
<thead>
<tr>
<th>Operating Systems:</th>
<th>Windows2000? or WindowsXP?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Browsers (for SENDERs):</td>
<td>Internet Explorer 6.0? or above</td>
</tr>
<tr>
<td>Browsers (for SIGNERS):</td>
<td>Internet Explorer 6.0?, Mozilla FireFox 1.0, Netscape 7.2 (or above)</td>
</tr>
<tr>
<td>Email:</td>
<td>Access to a valid email account</td>
</tr>
<tr>
<td>Screen Resolution:</td>
<td>800 x 600 minimum</td>
</tr>
<tr>
<td>Enabled Security Settings:</td>
<td>• Allow per session cookies</td>
</tr>
<tr>
<td></td>
<td>• Users accessing the internet behind a Proxy Server must enable HTTP 1.1 settings via proxy connection</td>
</tr>
</tbody>
</table>

** These minimum requirements are subject to change. If these requirements change, we will provide you with an email message at the email address we have on file for you at that time providing you with the revised hardware and software requirements, at which time you will have the right to withdraw your consent.
**Acknowledging your access and consent to receive materials electronically**

To confirm to us that you can access this information electronically, which will be similar to other electronic notices and disclosures that we will provide to you, please verify that you were able to read this electronic disclosure and that you also were able to print on paper or electronically save this page for your future reference and access or that you were able to e-mail this disclosure and consent to an address where you will be able to print on paper or save it for your future reference and access. Further, if you consent to receiving notices and disclosures exclusively in electronic format on the terms and conditions described above, please let us know by clicking the 'I agree' button below.

By checking the 'I Agree' box, I confirm that:

- I can access and read this Electronic CONSENT TO ELECTRONIC RECEIPT OF ELECTRONIC RECORD AND SIGNATURE DISCLOSURES document; and

- I can print on paper the disclosure or save or send the disclosure to a place where I can print it, for future reference and access; and

- Until or unless I notify Georgia Department of Transportation as described above, I consent to receive from exclusively through electronic means all notices, disclosures, authorizations, acknowledgements, and other documents that are required to be provided or made available to me by Georgia Department of Transportation during the course of my relationship with you.