Date: November 22, 2011

DEPARTMENT OF TRANSPORTATION

STATE OF GEORGIA

SPECIAL PROVISION

COUNTY

P.I. NO.

Section 009-Certified Arborist

Add the following:

009.1 General Description

This Section applies services rendered by a Certified Arborist during the construction of the project.

009.02 Related References

Sec. 201 Grading Complete

Sec. 441 Miscellaneous Concrete

009.2 Responsibilities

1. During Construction

A. Certified Arborist to serve as a consultant to the Contractor for the duration of the project. Arborist shall preform bi-monthly site inspections to document compliance of plans, tree protection standards, provide prescriptions for impacted trees and soil compaction management.

2. Post Construction

B. Certified Arborist to provide client with a final construction report on health of existing trees post completion of project and document impacted trees susceptible to dying within 5 years of project completion.

Add the following:

009.5 Payment

Certified Arborist is paid for as a lump sum per entire project. The payment is full compensation for all services rendered to complete the work.

Payment will be made under:

Item No. 009	Certified Arborist	LS

End of Section 009

Date: August 10, 2011

DEPARTMENT OF TRANSPORTATION

STATE OF GEORGIA

SPECIAL PROVISION

COUNTY

P.I. NO.

Section 009-Stacked Stone Wall

Add the following:

009.1 General Description

This Work includes construction of a stacked stone wall as shown on plans, and shall include, but is not limited to, the following components:

A. Stone
B. Filter Fabric

009.02 Related References

Sec. 201 Grading Complete

009.2 Materials

1. Stone

A. Defective Units: Referenced masonry unit standards may allow a certain percentage of units to contain chips, cracks, or other defects exceeding limits stated in the standard. Do not use units where such defects will be exposed in the completed Work.

B. Fire-Resistance Ratings: Where indicated, provide units that comply with requirements for fire-resistance ratings indicated as determined by testing according to ASTM E 119, by equivalent masonry thickness, or by other means, as acceptable to authorities having jurisdiction.

2. Filter Fabric

A. Geotextile used for separation, stabilization, and drainage applications shall be in accordance with AASHTO M288-00.

Add the following:

009.5 Payment

Section 009 – Stacked Stone Wall

Stacked stone wall is paid for at the linear foot price per entire project. The payment is full compensation for all excavation, construction and installation of each wall, including preparation of sand and mortar, disposal of excavated materials, and the cost of furnishing all tools, safety devices, labor, equipment and all other necessary items to complete the work.

Payment will be made under:

Item No. 009	Stacked Stone Wall	LF

End of Section 009

Date: June 26, 2012

DEPARTMENT OF TRANSPORTATION

STATE OF GEORGIA

SPECIAL PROVISION

COUNTY

P.I. NO.

Section 607-Stone Seat Wall

Add the following:

607.1 General Description

This Work includes construction of a Stone Seat Wall as shown on plans, and shall include, but is not limited to, the following components:

A. Stone Veneer
B. CMU
C. Mortar and Grout Mixes
D. Reinforcement

607.1.01 Related References

Sec. 430 Portland Cement Concrete Pavement

Sec. 500 Concrete Structures

607.1.02 Quality Assurance

Prior to installation of Stone Seat Wall, erect an 18" tall by 3' long by 18" wide mock-up. Provide materials and workmanship to be expected in the completed work.

607.1.03 Delivery, Storage, and Handling

A. Material Protection

1. Protect Stone Seat Wall materials during storage and construction against wetting by rain, snow or groundwater and against soilage of contamination from earth or other types of materials.

607.2 Materials

1. Masonry Units, General

A. Defective Units: Referenced masonry unit standards may allow a certain percentage of units to contain chips, cracks, or other defects exceeding limits stated in the standard. Do not use units where such defects will be exposed in the completed Work.

B. Fire-Resistance Ratings: Where indicated, provide units that comply with requirements for fire-resistance ratings indicated as determined by testing according to ASTM E 119, by equivalent masonry thickness, or by other means, as acceptable to authorities having jurisdiction.

2. Concrete Masonry Units

A. Shapes: Provide shapes indicated and for lintels, corners, jambs, sashes, movement joints, headers, bonding, and other special conditions.

B. Integral Water Repellent: Provide units made with liquid polymeric, integral water repellent admixture that does not reduce flexural bond strength for exposed units.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. ACM Chemistries; RainBloc.
b. BASF Aktiengesellschaft; Rheopel Plus.
c. Grace Construction Products, W. R. Grace & Co. - Conn.; Dry-Block.

C. CMUs: ASTM C 90.

1. Unit Compressive Strength: Provide units with minimum average net-area compressive strength of 2150 psi.
2. Density Classification: Normal weight

3. Stone Veneer

A. General: Provide sizes and shapes that will vary. Stone veneer to remain consistent with PCID standard Tennessee fieldstone.

1. The cap shall have stone pieces that are relatively flat that will create a pleasurable seating place.

4. Mortar and Grout Materials

A. Regional Materials: Provide aggregate for mortar and grout, cement, and lime that have been extracted, harvested, or recovered, as well as manufactured, within 500 miles of Project site.

B. Portland Cement: ASTM C 150, Type I or II, except Type III may be used for cold-weather construction. Provide natural color or white cement as required to produce mortar color indicated.

C. Hydrated Lime: ASTM C 207, Type S.

D. Portland Cement-Lime Mix: Packaged blend of portland cement and hydrated lime containing no other ingredients.

E. Masonry Cement: ASTM C 91.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

    a. Capital Materials Corporation; Flamingo Color Masonry Cement.
    b. Cemex S.A.B. de C.V.
    c. Essroc, Italcementi Group
    d. Holcim (US) Inc.
    e. Lafarge North America Inc.
    f. Lehigh Cement Company
    g. National Cement Company, Inc.; Coosa Masonry Cement.

F. Mortar Pigments: Natural and synthetic iron oxides and chromium oxides, compounded for use in mortar mixes and complying with ASTM C 979. Use only pigments with a record of satisfactory performance in masonry mortar.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

    a. Davis Colors; True Tone Mortar Colors.
    b. Lanxess Corporation; Bayferrox Iron Oxide Pigments.
    c. Solomon Colors, Inc.; SGS Mortar Colors.

G. Colored Cement Product: Packaged blend made from portland cement and hydrated lime and mortar pigments, all complying with specified requirements, and containing no other ingredients.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

    a. Colored Portland Cement-Lime Mix:

        1) Capital Materials Corporation; Riverton Portland Cement Lime Custom Color.
        2) Holcim (US) Inc.; Rainbow Mortamix Custom Color Cement/Lime.
        3) Lafarge North America Inc.; Eaglebond Portland & Lime.
        4) Lehigh Cement Company; Lehigh Custom Color Portland/Lime Cement.

    b. Colored Masonry Cement:

        1) Capital Materials Corporation; Flamingo Color Masonry Cement.
        2) Cemex S.A.B. de C.V.; Richcolor Masonry Cement.
        3) Essroc, Italcementi Group; Brixment-in-Color.
        4) Holcim (US) Inc.; Rainbow Mortamix Custom Color Masonry Cement.
        5) Lafarge North America Inc.; U.S. Cement Custom Color Masonry Cement.
        6) Lehigh Cement Company; Lehigh Custom Color Masonry Cement.
        7) National Cement Company, Inc.; Coosa Masonry Cement.

H. Aggregate for Mortar: ASTM C 144.

1. For joints less than 1/4 inch thick, use aggregate graded with 100 percent passing the No. 16 sieve.
2. White-Mortar Aggregates: Natural white sand or crushed white stone.
3. Colored-Mortar Aggregates: Natural sand or crushed stone of color necessary to produce required mortar color.

I. Aggregate for Grout: ASTM C 404.

J. Epoxy Pointing Mortar: ASTM C 395, epoxy-resin-based material formulated for use as pointing mortar for structural-clay tile facing units (and approved for such use by manufacturer of units); in color indicated or, if not otherwise indicated, as selected by Architect from manufacturer's colors.

K. Cold-Weather Admixture: Nonchloride, noncorrosive, accelerating admixture complying with ASTM C 494/C 494M, Type C, and recommended by manufacturer for use in masonry mortar of composition indicated.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. Euclid Chemical Company (The); Accelguard 80.
b. Grace Construction Products, W. R. Grace & Co. - Conn.; Morset.
c. Sonneborn Products, BASF Aktiengesellschaft; Trimix-NCA.

L. Water-Repellent Admixture: Liquid water-repellent mortar admixture intended for use with CMUs containing integral water repellent by same manufacturer.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. ACM Chemistries; RainBloc for Mortar.
b. BASF Aktiengesellschaft; Rheopel Mortar Admixture.
c. Grace Construction Products, W. R. Grace & Co. - Conn.; Dry-Block Mortar Admixture.

M. Water: Potable.

5. Reinforcement

A. Uncoated Steel Reinforcing Bars: ASTM A 615/A 615M or ASTM A 996/A 996M, Grade 60.

B. Masonry Joint Reinforcement, General: ASTM A 951/A 951M.

1. Exterior Walls: Hot-dip galvanized, carbon Stainless steel.
2. Wire Size for Side Rods: 0.148-inch diameter.
3. Wire Size for Cross Rods: 0.148-inch diameter.
4. Wire Size for Veneer Ties: 0.148-inch diameter.
5. Spacing of Cross Rods, Tabs, and Cross Ties: Not more than 16 inches o.c.
6. Provide in lengths of not less than 10 feet with prefabricated corner and tee units.

607.3 Construction Requirements

This Work constructing stone seat walls as shown on plans, and shall include, but is not limited to, the following components:

607.3.01 Personnel

General Provisions 101 through 150.

607.3.02 Preparation

Examine areas and conditions, with Installer present, for compliance with requirements for correct and level finished grade, mounting surfaces, installation tolerances, and other conditions affecting performance. Proceed with installation only after unsatisfactory conditions have been corrected.

607.3.03 Equipment

General Provisions 101 through 150.

607.3.04 Fabrication

General Provisions 101 through 150.

607.3.05 Construction

1. Installation, General

A. Use stones of varying sizes without cutting if possible.

B. Select and arrange stone to produce a uniform blend of colors and textures.

2. Laying Walls

A. Lay out walls in advance for accurate CMU core spacing and radii that reflect the construction plans.

B. Fill cores in hollow CMUs with grout 24 inches under bearing plates, beams, lintels, posts, and similar items unless otherwise indicated.

C. Mortar back 3rd of stone veneer to CMU wall to give wall a stacked stone appearance.

3. Masonry Joint Reinforcement

A. General: Install entire length of longitudinal side rods in mortar with a minimum cover of 5/8 inch on exterior side of walls, 1/2 inch elsewhere. Lap reinforcement a minimum of 6 inches

1. Space reinforcement not more than 16 inches o.c.
2. Space reinforcement not more than 8 inches o.c. in foundation walls and parapet walls.
3. Provide reinforcement not more than 8 inches above and below wall openings and extending 12 inches beyond openings

B. Interrupt joint reinforcement at control and expansion joints unless otherwise indicated.

C. Provide continuity at wall intersections by using prefabricated T-shaped units.

D. Provide continuity at corners by using prefabricated L-shaped units.

607.3.07 Contractor Warranty and Maintenance

General Provisions 101 through 150.

Add the following:

607.5 Payment

Stone Seat Wall is paid for at the linear foot price per entire project. The payment is full compensation for all excavation, construction and installation of each wall, including preparation of sand and mortar, disposal of excavated materials, and the cost of furnishing all tools, safety devices, labor, equipment and all other necessary items to complete the work.

Payment will be made under:

Item No. 607	Stone Seat Wall	LF

End of Section 607

Date: June 26, 2012

DEPARTMENT OF TRANSPORTATION

STATE OF GEORGIA

SPECIAL PROVISION

DEKALB COUNTY

P.I. NO. 0010164

Section 639- Strain Poles for Overhead Sign and Signal Assemblies

639.2 Materials

1. Mast Arm Pole

A. Manufacturer

1. Valmont Industries
   1950 Industrial Boulevard
   Jasper, TN 37347
   (423) 942-6078

   Or

2. Union Metal Corporation
   1432 Maple Ave., NE
   Canton, OH 44705

   Or

3. Approved Equal

B. Model

1. Valmont Industries
   Fluted 30’ Height
   19’ signal arm mount, 29’6” light mount
   Light Arm and Attachment: Valmont Paramount 8” span

   Or

2. Union Metal Corporation
   Fluted 30’ Height
   19’ signal arm mount, 29’6” light arm mount
   Light Arm and Attachment: Shakespeare Composite Structures OPDR-18 8” span

   Or

3. Approved Equal

C. Finish of all mast arm poles shall be: Special Order Dark Green.

2. Mast Arm Skirt

A. Manufacturer

1. Spring City Elec. Mfg. Company
   Hall and Main Streets
   Spring City, PA 19475
   (610) 948-4000

   Or

2. Valmont Industries
   1950 Industrial Boulevard
   Jasper, TN 37347
   (423) 942-6078

   Or

3. Approved Equal

B. Model

1. Spring City Elec. Mfg. Company
   WBNRT-27 Steel

   Or

2. Valmont
   HN48AC

   Or

3. Approved Equal

C. Finish of all mast arm skirts shall be: Special Order Dark Green with PCID logo.

3. Mast Arm Light

A. Manufacturer

1. Holophane
   Granville Business Park
   Building A
   3825 Columbus Rd SW
   Granville, Ohio 43023
   (866) 465-6742

   Or

2. King Luminaire
   9200 Energy Lane
   Northport, Alabama 35476-3442
   (205) 339-0711

   Or

3. Approved Equal

B. Model

1. Holophane
   Memphis Tear Drop Fixture

   Or

2. King Luminaire
   K704 Coronet Jr. Luminaire

   Or

3. Approved Equal

C. Finish of all mast arm lights shall be: Special Order Dark Green.

Payment will be made under:

Item No. 639	Strain Poles, Type _____	Per each

End of Section 639

Date: November 22, 2011

Georgia Department of Transportation

State of Georgia

P.I. NO.

COUNTY

Special Provision

Section 643—Ornamental Fence

Add the following:

643.1 General Description

This Work consists of the construction and installation of ornamental fence locations as shown on the plans.

Add the following:

643.1.01 Submittals

A. Product Data

For the product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, finishes, field-assembly requirements, and installation details.

B. Material Certificates

For ornamental fence, signed by manufacturer.

C. Maintenance Data

Include maintenance manuals for selected ornamental fence.

643.1.02 Quality Assurance

The contractor shall provide laborers and supervisors who are thoroughly familiar with the type of construction involved and materials and techniques specified.

643.1.03 Product Handling and Storage

Upon receipt at the job site, all materials shall be checked to ensure that no damage occurred during shipping or handling. Materials shall be stored in such a manner to ensure proper ventilation and drainage, and to protect against damage, weather, vandalism and theft.

Add the following:

643.2 Materials

Furnish only new materials and equipment for this work. Subject to compliance with requirements, provide the following or equal:

643.1.01 Manufacturer

Basis for Design:

1. Ameristar
   1555 N. Mingo Rd.
   Tulsa, OK 74116

(888) 333-3422
Model: Montage II Classic 3 Rail

Or

2. Ultra Aluminum Manufacturing Inc.
   2124 Grand Commerce Dr.
   Howell, MI 48855
   (517) 548-6755
   Model: UAS-101

   Or

3. Master Halco
   3430 Empire Blvd SW
   Atlanta, GA 30354
   (404) 766-0063
   Model: Montage

A. Model: Basis for design model: Montage II Classic 3 Rail

B. Color/Finish: Ornamental fence to be Powdercoat Black

643.1.02 Material

A. Steel material for fence panels and posts shall conform to the requirements of ASTM A653/A653M, with a minimum yield strength of 45,000 psi (310 MPa) and a minimum zinc (hot-dip galvanized) coating weight of 0.90 oz/ft2 (276 g/m2), Coating Designation G-90. A minimum of 62% of the steel material shall be derived from recycled scrap metal.

B. Material for pickets shall be 1" square x 14 Ga. tubing. The rails shall be steel channel, 1.75" x 1. 75" x .105". Picket holes in the rail shall be spaced 4.715" o.c. Fence posts and gate posts shall meet the minimum size requirements of Table 1.

643.1.03 Fabrication

A. Pickets, rails and posts shall be pre-cut to specified lengths. Rails shall be pre-punched to accept pickets.

B. Pickets shall be inserted into the pre-punched holes in the rails and shall be aligned to standard spacing using a specially calibrated alignment fixture. The aligned pickets and rails shall be joined at each picket-to-rail intersection by Ameristar's proprietary fusion welding process, thus completing the rigid panel assembly (Note: The process produces a virtually seamless, spatter-free good-neighbor appearance, equally attractive from either side of the panel).

C. The manufactured panels and posts shall be subjected to an inline electrodeposition coating (E-Coat) process consisting of a multi-stage pretreatment/wash (with zinc phosphate), followed by a duplex application of an epoxy primer and an acrylic topcoat. The minimum cumulative coating thickness of epoxy and acrylic shall be 2 mils (0.058 mm). The color shall be (specify Black or Bronze). The coated panels and posts shall be capable of meeting the performance requirements for each quality characteristic shown in Table 2 (Note: The requirements in Table 2 meet or exceed the coating performance criteria of ASTM F2408).

D. The manufactured fence system shall be capable of meeting the vertical load, horizontal load, and infill performance requirements for Industrial weight fences under ASTM F2408.

E. Swing gates shall be fabricated using 1.75" x 14ga Forerunner double channel rail, 2" sq. x 11ga. gate ends, and 1" sq. x 14ga. pickets. Gates that exceed 6' in width will have a 1.75" sq. x 14ga. intermediate upright. All rail and upright intersections shall be joined by welding. All picket and rail intersections shall also be joined by welding. Gusset plates will be welded at each upright to rail intersection. Cable kits will be provided for additional trussing for all gates leaves over 6'.

Add the following:

643.3 Construction Requirements

This Work includes installation of bollards as shown on plans, and shall include, but is not limited to, the following components:

643.3.01 Preparation

All new installation shall be laid out by the contractor in accordance with the construction plans.

643.3.02 Construction

A. Installation

Fence post shall be spaced according to Table 3, plus or minus ½". For installations that must be raked to follow sloping grades, the post spacing dimension must be measured along the grade. Fence panels shall be attached to posts with brackets supplied by the manufacturer. Posts shall be set in concrete footers having a minimum depth of 36" (Note: In some cases, local restrictions of freezing weather conditions may require a greater depth). The "Earthwork" and "Concrete" sections of this specification shall govern material requirements for the concrete footer. Posts setting by other methods such as plated posts or grouted core-drilled footers are permissible only if shown by engineering analysis to be sufficient in strength for the intended application.

B. Installation Maintenance

When cutting/drilling rails or posts adhere to the following steps to seal the exposed steel surfaces; 1) Remove all metal shavings from cut area. 2) Apply zinc-rich primer to thoroughly cover cut edge and/or drilled hole; let dry. 3) Apply 2 coats of custom finish paint matching fence color. Failure to seal exposed surfaces per steps 1-3 above will negate warranty. Ameristar spray cans or paint pens shall be used to prime and finish exposed surfaces; it is recommended that paint pens be used to prevent overspray. Use of non-Ameristar parts or components will negate the manufactures' warranty.

C. Cleaning

The contractor shall clean the jobsite of excess materials; post-hole excavations shall be scattered uniformly away from posts.

Table 1 – Minimum Sizes for Montage II Posts

Fence Posts	Panel Height
2-1/2" x 12 Ga.	Up to & Including 6' Height
3" x 12 Ga.	Over 6' Up to & Including 8' Height

Gate Leaf	Gate Height		
	Up to & Including 4'	Over 4' Up to & Including 6'	Over 6' Up to & Including 8'
Up to 4'	2-1/2" x 12 Ga.	3" x 12 Ga.	3" x 12 Ga.
4'1" to 6'	3" x 12Ga.	4" x 11 Ga.	4" x 11 Ga.
6'1" to 8'	3" x 12 Ga.	4" x 11 Ga.	6" x 3/16"
8'1" to 10'	4" x 11 Ga.	6" x 3/16"	6" x 3/16"
10'1" to 12'	4" x 11 Ga.	6" x 3/16"	6" x 3/16"
12'1" to 14'	4" x 11 Ga.	6" x 3/16"	6" x 3/16"
14'1" to 16'	6" x 3/16"	6" x 3/16"	6" x 3/16"

Table 2 – Coating Performance Requirements

Quality Characteristics	ASTM Test Method	Performance Requirements
Adhesion	D3359 – Method B	Adhesion (Retention of Coating) over 90% of test area (Tape

		and knife test).
Corrosion Resistance	B117, D714 & D1654	Corrosion Resistance over 1,500 hours (Scribed per D1654; failure mode is accumulation of 1/8" coating loss from scribe or medium #8 blisters).
Impact Resistance	D2794	Impact Resistance over 60 inch lb. (Forward impact using 0.625" ball).
Weathering Resistance	D822 D2244, D523 (60˚ Method)	Weathering Resistance over 1,000 hours (Failure mode is 60% loss of gloss or color variance of more than 3 delta-E color units).

Table 3 – Montage II – Post Spacing By Bracket Type

Span	For INVINCIBLE® 8' Nominal (91-1/4" Rail)		For CLASSIC, GENESIS, & MAJESTIC 8' Nominal (92-5/8" Rail)					
Post Size	2-1/2"	3"	2-1/2"	3"	2-1/2"	3"	2-1/2"	3"
Bracket Type	Industrial Flat Mount (BB301)		Industrial Universal (BB302)	Industrial Universal (BB303)	Industrial Flat Mount (BB301)		Industrial Swivel (BB304)*	
Post Settings ± ½" O.C.	94-1/2"	95"	96"	96-1/2"	96"	96-1/2"	*96"	*96-1/2"
*Note: When using BB304 swivel brackets on either or both ends of a panel installation, care must be taken to ensure the spacing between post and adjoining pickets meets applicable codes. This will require trimming one or both ends of the panel.								

Add the following:

643.3.05 Quality Acceptance

Obtain ornamental fence through one source from a single manufacturer.

Add the following:

643.5 Payment

Ornamental Fence is paid for at the unit price bid per linear foot complete and in place as specified. The payment is full compensation for all excavation and installation of each unit, including preparation of sand and mortar, disposal of excavated materials, and the cost of furnishing all tools, safety devices, labor, equipment and all other necessary items to complete the work.

Payment will be made under:

Item No. 643	Ornamental Fence	Per Linear Foot

End of Section 643

Date: February 14, 2012

DEPARTMENT OF TRANSPORTATION

STATE OF GEORGIA

SPECIAL PROVISION

COUNTY

P.I. NO.

Section 647- Traffic Signal Installation

(For Use on Decorative Mast Arms in the PCID)

647.2 Materials

1. Pedestrian Signal Post

A. Manufacturer

1. Hapco
   26252 Hillman Highway
   Abingdon, VA 24210
   (800) 368-7171

   Or

2. Spring City Elec. Mfg. Company
   Hall and Main Streets
   Spring City, PA 19475
   (610) 948-4000

   Or

3. Approved Equal

B. Model

1. Hapco
   York Series Fluted
   10’ Mounting Height

   Or

2. Spring City Elec. Mfg. Company
   Northampton Pole
   SBNH16.5-W Steel
   12’ Mounting Height

   Or

3. Approved Equal

C. Finish of all pedestrian signal posts shall be: Special Order Dark Green.

2. Illuminated Sign

A. Manufacturer

1. Southern Manufacturing
   501 Herndon Ave.
   Orlando, FL 32803
   (800) 866-5699

   Or

2. McCain Inc.
   2365 Oak Ridge Way
   Vista, CA 92081
   (888) 262-2246

   Or

3. Approved Equal

B. Model

Southern Manufacturing
LED Illuminated Street Sign
19" Height 48"/72"/96" Width
Double-Faced

Or

2. McCain Inc.
   LED Illuminated Street Sign
   19" Height 48"/72"/96" Width
   Double-Faced

   Or

3. Approved Equal

647.3 Miscellaneous Materials

3. 2070 ATC Controller Database Conversion

A. 2070 ATC

For intersections that do not have a 2070 ATC formatted database, convert existing database to 2070 ATC formatted database.

1. Contact maintaining agency to obtain existing controller database.
2. Coordinate converted 2070 ATC formatted database with Department (or designee) to verify local controller settings and agency preferences.
3. Submit converted databases to Department (or designee) for review and approval.
4. Coordinate with contractor to obtain new 2070 controller(s) that are to be installed in the field.
5. Enter approved converted database into Central Software Program and new 2070 controller(s).

B. Testing

1. Evaluate and Test each converted database for a twenty-four hour period. Clear controller alarms and reports at the beginning of the evaluation period.
2. Monitor operation and address operations issues during testing period.
3. Document operational deficiencies that may require programming data changes.
4. Return successfully tested databases to contractor for installation.

C. Final converted 2070 ATC databases to be provided to the Department (or designee).

Payment will be made under:

Item No. 647	Traffic signal installation no -	Per lump sum
Item No. 647	Internally illuminated street sign	Per each

End of Section 647

Date: November 22, 2011

DEPARTMENT OF TRANSPORTATION

STATE OF GEORGIA

SPECIAL PROVISION

COUNTY

P.I. NO.

Section 754—Outdoor Furniture

Add the following:

754.1 General Description

This Work includes furnishing and installing outdoor furniture as shown on plans, and shall include, but is not limited to, the following components:

A.Trash receptacles
B. Benches

754.1.01 Submittals

A. Product Data

For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, finishes, field-assembly requirements, and installation details.

B. Product Schedule

For site and street furnishings. Use same designations indicated on Drawings.

C. Material Certificates

For site and street furnishings, signed by manufactures.

D. Maintenance Data

For site and street furnishings to include in maintenance manuals.

Add the following:

754.2 Materials

Furnish only new materials and equipment for this work. Subject to compliance with requirements, provide the following or equal:

A. Trash Receptacles:

1. Basis-of-Design product: PD5001-26-30 Presidio Collection as manufactured by Landscape Forms, Inc., 431 Lawndale Ave. Kalamazoo, MI 49048
2. Description: Square trash receptacle with top opening.
   a. Presidio Litter Recptacle
   Style:
      1. Top Opening:
         -Height: 30 inches.
         -Nominal Size: 26 inches square.

Mounting:
1. Surface Mounted

Liners:
1. Capacity: 30 gallons
2. Color: Black

Options:
1. Keyed Lock

b. Material

1. Frame: Leg and upper frame construction of tubular steel 1-1/4" outer diameter, 0.120" wall thickness. Lower frame constructed of tubular steel 1" outer diameter, 0.120" wall thickness.
2. Side Panels: Constructed of 5/8" outer diameter round, steel rod, welded to frame.
3. Door Mechanism: Door latch U-bolt, hinge pin, and catch plate for stainless steel. Foot latch lever is HDPE, natural color.
4. Lids: Constructed of 1-1/4" steel tubing 0.120" wall thickness. Insert panel constructed of steel sheet.
   a. Top Opening: 11-gauge
   b. Side Opening: 14-gauge.
5. Liners: Polyethylene pigmented to coordinate with powdercoat color.
6. Keyed Lock: Nickel finish, double sided, 8 tumbler, keyed alike. Lock plate is stainless steel.
7. Ash Urn: Formed of 1/8" aluminum.
   -Size: 7 inches wide by 3 inches deep.

c. Finish

1. Finish on Metal: Landscape Forms, Inc. "Pangard II".
   a. Primer: Rust inhibitor on ferrous supports.
   b. Topcoat: Thermosetting TGIC polyester powder coat. UV, chip, and flake resistant.
   c. Test Results: "Pangard II".
      I. Gloss Consistency, Gardner 60 Degrees, ASTM D 523: Plus or minus 5 percent from standard.
      II. UV Resistance, Color and Gloss, ASTM G 155, Cycle 7: Delta E less than 2 at 2.0 mils and less than 20 percent loss.
      III. Cross-Hatch Adhesion, ASTM D 3359, Method B: 100 percent pass.
      IV. Flexibility Test, Mandrel, ASTM D 522: 3 mm at 2 mils.
      V. Erichsen Cupping, ISO 1520: 8 mm.
      VI. Impression Hardness, Buchholz, ISO 2815: 95.
      VII. Impact Test, ASTM D 2794: 60 inch-pounds at 2.5 mils.
      VIII. Pencil Hardness, ASTM D 3363: 2H minimum.
      IX. Corrosion Resistance, 1,500-Hour Test, ASTM B 117: Max. undercutting 1 mm.
      X. Humidity Resistance, 1,500-Hour Test, ASTM D 2247: Max. blisters 1 mm.
   d. Color: Black

3. Equivalent Design: Manufactures with products of equivalent design may include, but are not limited to:
   a. Fairweather Site Furnishings and Accessories, 1540 Leader International Drive Port Orchard WA 98367-6437

      Color: Black as selected by Architect from manufacturer's full range.

   b. Approved Alternate

B. Benches:

1. Basis-of-Design product: PD3001-BS-22 Presidio Collection as manufactured by Landscape Forms, Inc., 431 Lawndale Ave. Kalamazoo, MI 49048
2. Description: 3 seated metal bench.

   a. Presidio Bench

   Style:

   1. Straight:

   Seat Style:

   1. Backed Straight Seat:
      -Width: 22-1/2 inches

-Depth: 30 inches

Number of Seats: 3.

Support Tube:

1. 3 seat support

Arm Rest:

1. No Arms

Mounting:

1. Surface Mount

Options:

1. Keyed Lock

b. Material

1. Supports: Dual horizontal rail, 2-1/2" diameter, 0.120" wall tubing, with continuous weld end caps. Vertical supports are 2-1/2" diameter 0.120" wall tube with 5-1/2" diameter, 5/16" thick surface plate with (3) – 9/16" diameter mounting holes.
   a. Adapters: Adapters are ¼" thick, stainless steel. They are self-centering clamping style adapters with a single bolt connection.
2. Seats:
   a. Frame: 1-1/4" diameter 0.120" wall tube with four mitered corners. Seat profile follows a reverse bend outline.
   b. Insert Panel: Constructed of 5/8" diameter, round, steel rod, welded to frame
   c. Arms are 1-1/4" diameter 0.120" wall tube welded to seat frame.

3. Equivalent Design: Manufactures with products of equivalent design may include, but are not limited to:
   a. DuMor Site Furnishings, P.O. Box 142 Mifflintown, PA 17059-0142
   b. Approved Alternate

Color: Black as selected by Architect from manufacturer's full range.

Anchors, Fasteners, Fittings, and Hardware: Manufacturer's standards, corrosion-resistant-coated or noncorrodible materials; commercial quality; tamperproof, vandal and theft resistant; concealed, recessed, and capped or plugged. Provide as required from site and street furnishings' assembly, mounting, and secure attachment.

Nonshrink, Nonmetallic Grout: Premixed, factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107. Provide grout, recommended in writing by manufacturer, for exterior applications.

Erosion-Resistant Anchoring Cement: Factory-packaged, nonshrink, nonstaining, hydraulic-controlled expansion cement formulation for mixing with potable water at Project site to create pourable anchoring, patching, and grouting compound. Provid formulation that is resistant to erosion from water exposure without needing protection by a sealer or waterproof coating and that is recommended in writing by manufacturer for exterior applications.

Add the following:

754.3 Construction Requirements

This Work includes furnishing and installing outdoor furniture as shown on plans, and shall include, but is not limited to, the following components:

Add the following:

754.3.03 Preparation

Examine areas and conditions, with Installer present, for compliance with requirements for correct and level finished grade, mounting surfaces, installation tolerances, and other conditions affecting performance. Proceed with installation only after unsatisfactory conditions have been corrected.

Owner shall approve all locations and layouts of each piece of furniture prior to permanent installation.

Add the following:

754.3.05 Construction

A. Installation

Comply with manufacturer's written installation instructions, unless more stringent requirements are indicated. Complete field assembly of site furnishings, where required.

Unless otherwise indicated, install site furnishings after landscaping and paving have been completed.

Install site furnishings level, plump, true, and securely anchored at locations indicated on Drawings.

B. Cleaning

After completing site furnishing installation, inspect components. Remove spots, dirt, and debris. Repair damaged finishes to match original finish or replace component.

754.3.06 Quality Acceptance

Obtain each type of site furnishing through one source for a single manufacturer.

Add the following:

754.4 Measurement

The accepted street furniture quantities are measured in per each fixture in place in the completed work.

754.5 Payment

Outdoor furniture is paid for at the unit price bid per each unit complete and in place as specified. The payment is full compensation for all excavation, furnishing and installation of each unit, including preparation of sand and mortar, disposal of excavated materials, and the cost of furnishing all tools, safety devices, labor, equipment and all other necessary items to complete the work.

Payment will be made under:

Item No. 754	Outdoor Furniture	Per Each

End of Section 754

Date: November 22, 2011

Georgia Department of Transportation

State of Georgia

P.I. NO.

COUNTY

Special Provision

Section 900—Bollards

Add the following:

900.1 General Description

This Work consists of the construction and installation of bollards at locations as shown on plans.

Add the following:

900.1.01 Submittals

A. Product Data

For the product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, finishes, field-assembly requirements, and installation details.

B. Material Certificates

For bollards, signed by manufacturer.

C. Maintenance Data

Include maintenance manuals for selected bollard.

Add the following:

900.2 Materials

Furnish only new materials and equipment for this work. Subject to compliance with requirements, provide the following or equal:

A. Bollard Manufacturer

Basis for Design:

1. Antique Street Lamps
   2011-B.W. Rundberg Lane
   Austin, TX 78758
   (800) 410-8899
   Model: BCA BNY17DT

   Or

2. Amerlux Exterior
   5220 Shank Road
   Pearland, TX, 77581
   (800) 364-0098
   Model: DSDB17FL

Or

3. Dura Art Stone
   1324 Southern Road
   Morrow, GA 30260
   1(770)960-9550
   Model: PB-B B 30”

B. Model

Basis for design model: BCA BNY 17DT

C. Color/Finish

Bollard to be Special Order Dark Green

Add the following:

900.3 Construction Requirements

This Work includes installation of bollards as shown on plans, and shall include, but is not limited to, the following components:

Add the following:

900.3.03 Preparation

Examine areas and conditions, with Installer present, for compliance with requirements for correct and level finished grade, mounting surfaces, installation tolerances, and other conditions affecting performance. Proceed with installation only after unsatisfactory conditions have been corrected.

Owner shall approve all locations and layouts of each bollard prior to permanent installation.

Add the following:

900.3.05 Construction

A. Installation

Comply with manufacturer’s written installation instructions, unless more stringent requirements are indicated. Complete field assembly of bollards, where required.

Unless otherwise indicated, install bollards after landscaping and paving have been completed.

Install bollards level, plump, true, and securely anchored at locations indicated on Drawings. Bollards are to be located from face of curb as shown on plans.

B. Cleaning

After completing bollard installation, inspect components. Remove spots, dirt, and debris. Repair damaged finishes to match original finish or replace component.

900.3.06 Quality Acceptance

Obtain bollard through one source from a single manufacturer.

Add the following:

900.5 Payment

Bollards are paid for at the unit price bid per each unit complete and in place as specified. The payment is full compensation for all excavation and installation of each unit, including preparation of sand and mortar, disposal of excavated materials, and the cost of furnishing all tools, safety devices, labor, equipment and all other necessary items to complete the work.

Payment will be made under:

Item No. 900	Bollards	Per Each

End of Section 900

Date: November 22, 2011

DEPARTMENT OF TRANSPORTATION

STATE OF GEORGIA

SPECIAL PROVISION

COUNTY

P.I. NO.

Section 900 – Concrete Pavers

Add the following:

900.1 General Description

This Work includes installation of concrete pavers as shown on plans, and shall include, but is not limited to, the following components:

A. Specialty Paver Areas
B. ADA Detectable Warning Pavers

Add the following:

900.1.01 Submittals

A. Product Data

1. Submit manufacturer's technical data for each type of paver along with installation instructions.

B. Samples

1. Submit samples of each type of unit paver for approval by the Owner's Representative.
2. Submit samples of setting bed course materials and joint mortar. Samples are to include enough material to show the full range of exposed color and texture to be expected in the completed work.

C. Warranty

1. Submit manufacturer's warranty cosigned by Contractor which includes all labor and materials to replace all cracked or chipped pavers and reset any pavers settled or heaved out of plane within two years of substantial completion.

900.1.02 Project Conditions

A. Cold Weather Protection

1. Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen subgrade or setting beds. Remove and replace unit paver work damaged by frost or freezing.

B. Weather Limitations

1. Protect unit paver work against freezing when atmospheric temperature is 40 degrees F. and falling. Heat materials and provide temporary protection of completed portions of unit paver work. Comply with International Masonry All-Weather Council's "Guide Specification for Cold-Weather Masonry Construction."

C. Hot Weather Requirements

1. Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen subgrade or setting beds. Remove and replace unit paver work damaged by frost or freezing.

900.1.03 Quality Assurance

A. Installer Qualifications

1. Engage an experienced Installer who has successfully completed at least three years of unit paver installations similar in material, design and extent to that indicated for this project. At least one person with current Paver Installer Certification from the Interlocking Concrete Pavement Institute (ICPI) shall be present on site during paver installation and this person shall be responsible for supervising the installation of all concrete pavers.

B. Field-Constructed Mock-Up

1. Prior to installation of unit pavers, erect a 5' x 5' mock-up for the selected paver. Build mock up using materials and base construction, including special features for expansion joints and contiguous work. Provide range of color, texture, and workmanship to be expected in the completed work.

C. Manufacturer Observance

1. Manufacturer's representative will periodically inspect work, manage corrections, and certify to Contractor and Owner's Representative in writing that installation is in accordance with contract requirements.

900.1.04 Delivery, Storage, and Handling

A. Paver Protection

1. Protect unit pavers and aggregate during storage and construction against wetting by rain, snow or groundwater and against soilage of contamination from earth or other types of materials.

Add the following:

900.2 Materials

A. Concrete Unit Paver Manufacturer

Specialty Paver Areas

1. Basis-of-Design Product:
   Pavestone Company
   169 Peggy Lane
   Tyrone, Georgia 30290
   (770) 306-9691

   Or

2. Belgard Hardscapes
   125 Industrial Park Circle
   Lawrenceville, GA 30046
   (678) 252-2888

   Or

3. Cambridge Paving Stones
   Jerome Ave, PO Box 157
   Lyndhurst, NJ 07071
   (201) 933-5000

ADA Detectable Warning Paver

Basis-of-Design Product:

1. Pavestone Company
   169 Peggy Lane
   Tyrone, Georgia 30290
   (770) 306-9691

   Or

2. Hanover Architectural Products
   5000 Hanover Road
   Hanover, PA 17331
   (717) 637-0500

   Or

3. Approved Equal

B. Products

Indicated pavers, comply with ASTM C 936-82, and made from normal weight aggregate, unless otherwise indicated. Pavers to comply with following ASTM C 140 testing: 8,000 psi compressive strength, 169.2 lbs./cu.ft. density, and 5% water absorption per 24 hour period.

C. Color

Specialty paving areas shall be the color "Old Town Blend". ADA Detectable Warning Pavers shall be the color "River Red."

D. Pattern

Specialty paver areas shall have a herringbone paver field and a single course of pavers aligned in a soldier course banding as shown on plans. Within radial corner treatment areas install double soldier course banding within paver field as depicted per plans. ADA Detectable Warning Pavers shall be laid in a running bond pattern as shown on plans.

E. Protective Treatment

Provide final protection and maintain conditions in a manner acceptable to Installer, which ensures unit paver work being without staining, damage or deterioration.

900.3 Construction Requirements

This Work includes installation of bollards as shown on plans, and shall include, but is not limited to, the following components:

900.3.01 Preparation

All new installation shall be laid out by the contractor in accordance with the construction plans.

900.3.02 Construction

A. Installation for Specialty Paver Areas

1. Excavate unsuitable, unstable or unconsolidated subgrade material and compact the area which has been cleared. Backfill and level with dense graded aggregate suitable for base material (typically 4-6 inch of compacted base for light vehicular and pedestrian traffic) or as otherwise directed by Site Engineer/Architect/Landscape Architect.
2. Construct 4" concrete slab
3. Place paver on ½" mortar bed conforming to the grading requirements of ASTM C-33.
4. Install paver with vertical side joints approximately 1/8 inch (3mm).
5. Where required, cut pavers with an approved cutting device to fit accurately, neat and without damaged edges.
6. Insure pavers are uniformly level, true to grade and free of movement.
7. Spread sand to 1/8 inch thickness over entire paving area.
8. Make one more pass with plate compactor to fill joints with sand.

B. Installation for ADA Detectable Warning Pavers

1. Excavate unsuitable, unstable or unconsolidated subgrade material and compact the area which has been cleared. Backfill and level with dense graded aggregate suitable for base material (typically 4-6 inch of compacted base for light vehicular and pedestrian traffic) or as otherwise directed by Site Engineer/Architect/Landscape Architect.
2. Construct 4" concrete slab
3. Place paver on ½" mortar bed conforming to the grading requirements of ASTM C-33.
4. Install paver with vertical side joints approximately 1/8 inch (3mm).
5. Where required, cut pavers with an approved cutting device to fit accurately, neat and without damaged edges.
6. Insure pavers are uniformly level, true to grade and free of movement.
7. Fill paver joints with mortar.

Payment will be made under:

Item No. 900	Concrete Pavers	SF

End of Section 900

Date: August 10, 2011

DEPARTMENT OF TRANSPORTATION

STATE OF GEORGIA

SPECIAL PROVISION

COUNTY

P.I. NO.

Section 920- Aluminum Perforated Light Post

Add the following:

920.1 General Description

This Work includes furnishing and installation of lighting standards as shown on plans, and shall include, but is not limited to, the following components:

A. Alumninum Perforated Light Post, 12Ft.
B. Aluminum Perforated Light Post, 30Ft. MH, 6Ft. Arm
C. Aluminum Perforated Light Post, 30Ft. MH, 6Ft. Twin Arm

009.02 Related References

Sec. 681 Lighting Standards and Luminaires

Add the following:

920.2 Materials

1. 12' Aluminum Light Post

A. Manufacturer
1. Basis of Design:
General Electric
1975 Noble Road Building 338E
East Cleveland, OH 44112
1 (800) 694-3533

Or

2. Spring City Elec. Mfg. Company
Hall and Main Streets
Spring City, PA 19475
(610) 948-4000

Or

3. Approved Equal

B. Pole Standards
1. Pole design shall be: 12 ft. mounting height, York series fluted, PCID standard clamshell base.

C. Anchor Base
1. All anchor bases are to be constructed with breakaway bases. Attach the base to an approved breakaway device with an approved number and type of bolts, or use a base that is an approved breakaway type.

D. Finish of all poles shall be Special Order Dark Green.

2. 30’ Aluminum Light Post with 6’ Arm and 6’ Twin Arm

A. Manufacturer
1. Basis of Design:
Hapco
26252 Hillman Highway
Abingdon, VA 24210
1 (800) 368-7171

Or

2. Valmont Industries, Inc.
One Valmont Plaza
Omaha, Nebraska 68154
(402) 963-1198

Or

3. Approved Equal

B. Pole Standards
1. Pole design shall be: 30 ft. mounting height, Octoflute shaft, PCID standard clamshell base.

C. Anchor Base
1. All anchor bases are to be constructed with breakaway bases. Attach the base to an approved breakaway device with an approved number and type of bolts, or use a base that is an approved breakaway type.

D. Finish of all poles shall be Special Order Dark Green.

Payment will be made under:

Item No. 920	Aluminum Perforated Light Post, 12 Ft.	EA
Item No. 920	Aluminum Perforated Light Post, 30 Ft MH, 6 Ft. Arm.	EA
Item No. 920	Aluminum Perforated Light Post, 30 Ft MH, 6 Ft. Twin Arm.	EA

End of Section 920

Date: August 10, 2011

DEPARTMENT OF TRANSPORTATION

STATE OF GEORGIA

SPECIAL PROVISION

COUNTY

P.I. NO.

Section 921- Luminaires

Add the following:

921.1 General Description

This Work includes furnishing and installation of luminaires as shown on plans, and shall include, but is not limited to, the following components:

A. Luminaire, Type 3, 150 Watt, High Pressure Sodium
B. Luminaire, Type 5, 150 Watt, High Pressure Sodium
C. Luminaire, Type A, 400 Watt, High Pressure Sodium

009.02 Related References

Sec. 681 Lighting Standards and Luminaires

Add the following:

920.2 Materials

1. Luminaire, Type 3 and 5, 150 Watt, High Pressure Sodium

A. Manufacturer

1. Basis of Design:
Cooper Lighting
1121 Highway 74 South
Peachtree City, GA 30269
1 (770) 486-4800

Or

2. Holophane
1400 Lester Road
Conyers, GA 30012
(770) 483-6206

Or

3. Approved Equal

B. Luminaire Standards

1. Luminaire design shall be: Generation ACN Post Top Fixture

C. Finish of all luminaires shall be: Special Order Dark Green.

2. Luminaire, Type A, 400 Watt, High Pressure Sodium

A. Manufacturer

1. Basis of Design:
Holophane
1400 Lester Road
Conyers, GA 30012
(770) 483-6206

Or

2. King Luminaire
9200 Energy Lane
Northport, AL
(800) 435-6563

Or

3. Approved Equal

B. Luminaire Standards

1. Luminaire design shall be: Memphis Tear Drop Fixture, Arm Fixture: BHLF-200-SCA-GN, Arm: BH-72-(1 or 2)-CA-DG

C. Finish of all luminaires shall be Special Order Dark Green.

Payment will be made under:

Item No. 921	Luminaire, Type 3, 150 Watt, High Pressure Sodium	EA
Item No. 921	Luminaire, Type 5, 150 Watt, High Pressure Sodium	EA
Item No. 921	Luminaire, Type A, 400 Watt, High Pressure Sodium	EA

End of Section 921

February 14, 2012

DEPARTMENT OF TRANSPORTATION

STATE OF GEORGIA

SPECIAL PROVISION

COUNTY
P.I. NO.

Section 999 Rectangular Rapid Flashing Beacon Assembly

999.1 General Description

This work includes furnishing, installing, and making operational a pole mounted rectangular rapid flashing beacon assembly.

The Rectangular Rapid Flashing Beacon Assembly will alert motorists to the presence of a pedestrian in a marked crosswalk. The Rectangular Rapid Flashing Beacon Assembly will be push-button activated with irregular flashing yellow LEDs mounted with standard W11-2 and W16-7p crosswalk signs.

Provide Rectangular Rapid Flashing Beacon Assemblies in the quantities and locations indicated in the Plans.

Provide all equipment, materials, and work in accordance with all manufacturers' recommendations, including but not limited to all mounting, wiring and cabling, power supply, surge suppression, and communications equipment and materials.

Ensure all provisions of the MUTCD applicable to Warning Beacons are met except as otherwise provided in this Specification.

999.1.01 Definitions

Rectangular Rapid Flashing Beacon Assembly: a solar-powered beacon assembly with two pulsing yellow LED light sources, push button activation system, signs, solar power subsystem, wireless subsystem, cabinet, battery (s), pole, foundation, and all necessary wiring.

999.1.02 Related References

A. Georgia Department of Transportation Specifications

- Section 105 – Control of Work
- Section 150 – Traffic Control
- Section 636 – Highway Signs
- Section 647 – Traffic Signal Installation
- Section 850 – Aluminum Alloy Metals (Aluminum Pedestrian Pedestal Posts)
- Section 911 – Sign Posts
- Section 922 – Electrical Wire and Cable
- Section 925 – Traffic Signal Equipment

- Section 939 – Communications and Electronics Equipment

B. Referenced Documents

- American National Standards Institute (ANSI)
- Federal Communications Commission (FCC) regulations
- National Electric Code (NEC)
- Underwriters' Laboratories Inc. (UL)
- National Electrical Manufacturer Association (NEMA)
- Institute of Electrical and Electronic Engineers (IEEE)
- American Society of Testing and Materials (ASTM)
- American National Standards Institute (ANSI)
- Lightning Protection Institute (LPI)
- National Electrical Safety Code (NESC)
- Occupational, Safety, and Health Act (OSHA)
- Federal Highway Works Administration (FHWA)
- Nation Fire Protection Association (NFPA)
- National Cooperative Highway Research Program (NCHRP)
- Manual on Uniform Traffic Control Devices, 2009 ed. (MUTCD)
- American Association of State Highway Transportation Officials (AASHTO) Roadside Design Guide
- Society of Automotive Engineers (SAE) Std. J595

Obtain approval by the Engineer for all materials, equipment, accessories and components that are not in accordance with the specific standards and requirements. Ensure conflicts between referenced industry specifications and this specification are addressed by the Engineer.

Use the latest version of referenced industry specifications, standards, and practices in force and in existence as of this project's advertisement date unless otherwise noted.

Acquire and use all applicable manuals, guidelines, standards and practices applying to the design, construction, and testing activities required to complete this project.

999.1.03 Submittals

This chart is to be used as a guide and does not relieve the Contractor from submitting additional information to form a complete submittal package.

Section 999 Submittal Requirements									
Material	**Specification Reference**	**Catalog Cuts**	**Mfg. Spec.**	**Materials Cert.**	**Lab Test**	**Install. Proced.**	**Test Plan**	**Training Plan Maint. Proced.**	**Submittal Due Date (Cal. Days after NTP)**
Rectangular Rapid Flashing Beacon Assembly	999.2	X	X				X	X	30 Days

Provide six (6) copies of complete and thorough submittal data for all components required for this item. Furnish the submittal data to the Engineer.

Include in the submittal data complete technical and performance specifications on all hardware, materials and training to be performed under this contract. Provide technical schematics clearly showing how the proposed equipment works and is connected and configured.

Organize each package of submittal data and separate by hardware item. Include an index of all submittal data documents contained within the package. Provide neat, legible, and orderly submittal data. Organize each package of submittal data and separate by hardware item.

Use the "Materials Certification Package Index and Transmittal Form", contained in Section 105.02 of the Special Provisions, to document and list all material and components included in the submittal package.

Any submittal data submitted without the Index/Transmittal form or is incomplete or not clear will be rejected.

A. Rectangular Rapid Flashing Beacon Assembly

1. Rectangular Rapid Flashing Beacon

   Submit complete physical, performance, and operational materials submittal data for the Rectangular Rapid Flashing Beacon sign and all associated components.

2. Mounting Pole and Foundation

   - Submit complete physical, performance, and operational materials submittal data for the mounting pole and foundation.
   - Submit details of pole construction including foundation, base, pole, mounting height for all equipment and signs, and all necessary dimensions.

3. Wireless Subsystem

   - Submit complete physical, performance, and operational materials submittal data for the wireless subsystem and associated components.
   - Submit results of wireless configuration testing.

4. Solar Panel Subsystem

   Submit complete physical, performance, and operational materials submittal data for the solar panel and associated components.

B. Acceptance Testing

- Submit manufacturer's acceptance testing results for rectangular rapid flashing beacon and solar panel.
- Develop and submit detailed and through test procedures with full test plan descriptions and test results data sheets.

C. Warranties and Guarantees

Submit materials submittal data providing complete example documentation on all manufacturers' warranties or guarantees on all Rectangular Rapid Flashing Beacons, as required in Subsection 999.3.07.

D. Training

Submit a Training Plan including, at a minimum, a detailed description of course contents, a training course outline, resumes and references of the instructor(s), and the training notebook that the students will use during training. Submit a Training Plan within 30 calendar days of Contract Notice-to-Proceed. Obtain approval of the Plan from the Engineer.

Submit a written training date schedule a minimum of thirty (30) Calendar days in advance of the desired training date(s). Do not submit request to schedule the training prior to receiving the Engineer's approval of

the Training Plan. Allow the Engineer to adjust the proposed training schedule of the by up to seven (7) Calendar days, at no cost to the Department.

E. As-Built Documentation

Provide as-built/delivered documentation of the Rectangular Rapid Flashing Beacon Assembly within thirty (30) Calendar days of the completion of the Field Tests.

999.2 Materials

A. Rectangular Rapid Flashing Beacon Assembly

Ensure that the individual components and assemblies of the Rectangular Rapid Flashing Beacon Assembly conform to the requirements specified herein.

Ensure that all equipment, materials, components and assemblies of the Rectangular Rapid Flashing Beacon Assembly conform to manufacturer's requirements and recommendations.

Construct the system with all electronic components of solid-state design and modular construction and designed for the environment in which they will be installed.

Deliver the Rectangular Rapid Flashing Beacon Assembly with connectors, fasteners, etc. preventing reversed assembly or installation or where possible malfunction or personnel hazards might occur.

Deliver and install the Rectangular Rapid Flashing Beacon Assembly with any other equipment or components needed for safe and reliable operation.

Ensure the Rectangular Rapid Flashing Beacon Assembly is the same type shown in the example in detail drawing 999.3.

Ensure the Rectangular Rapid Flashing Beacon Assembly consists of but is not limited to the following components and materials:

- Rectangular Rapid Flashing Beacon Assembly
- Solar cell/battery power source
- Signs
- Wireless subsystem
- Push button activation system
- Mounting Hardware
- Configuration and data collection software
- Installation and testing

Ensure Rectangular Rapid Flashing Beacon Assembly meets the performance requirements listed below:

B. Beacon Dimensions and Placement in Sign Assembly

- Contains two rectangular-shaped yellow indications, each with an LED-array based light source. Each indication is a minimum of 5 inches wide by 2 inches high. LEDs face oncoming traffic when installed.
- The longer dimensions of the Rectangular Rapid Flashing Beacon indications are aligned horizontally.
- The minimum space between the two indications is 7 inches measured from inside edge of one indication to inside edge of the other indication.
- The outside edges of Rectangular Rapid Flashing Beacon indications, including any housing, do not project beyond the edges of the W11-2 sign.

- The Rectangular Rapid Flashing Beacon indications are located between the bottom of the crosswalk warning (W11-2) sign and the top of the supplemental downward diagonal arrow (W16-7p) sign.

C. Beacon Flashing Requirements

- The two yellow indications in each Rectangular Rapid Flashing Beacon flash in a rapidly alternating "wig-wag" flashing sequence (left light on, then right light on) when activated.
- Beacon flash rate is 70 to 80 periods of flashing per minute for each indication with alternating but approximately equal periods of rapid pulsing light emissions and dark operation.
- One yellow indication emits two rapid pulses of light and the other yellow indication emits three rapid pulses of light during each of its 70 to 80 flashing periods per minute.
- The flash rate of each individual yellow indication, as applied over the full on-off sequence of a flashing period of the indication, is not between 5 and 30 flashes per second, to avoid frequencies that might cause seizures.
- The light intensity of the yellow indications meets minimum specifications of Society of Automotive Engineers (SAE) standard J595 (Directional Flashing Optical Warning Devices for Authorized Emergency, Maintenance, and Service Vehicles) dated January 2005.

D. Beacon Operation

- The Rectangular Rapid Flashing Beacon stays normally dark and initiates operation only when actuated by a pedestrian.
- The Rectangular Rapid Flashing Beacon ceases operation at a predetermined time after pedestrian actuation and by passive detection, after the pedestrian clears the crosswalk.
- All Rectangular Rapid Flashing Beacons associated with a given crosswalk (including those with an advance crossing sign, if used) simultaneously commence operation of their alternating rapid flashing indications when activated and cease operation simultaneously.
- Uses pedestrian pushbuttons to actuate the Rectangular Rapid Flashing Beacons.
- Includes a pedestrian instruction sign with the legend PUSH BUTTON TO TURN ON WARNING LIGHTS mounted adjacent to or integral with each pedestrian pushbutton.
- The duration of a predetermined period of operation of the Rectangular Rapid Flashing Beacons following each actuation is based on the MUTCD procedures for timing of pedestrian clearance times for pedestrian signals.
- Includes a small light directed at and visible to pedestrians in the crosswalk installed integral to the Rectangular Rapid Flashing Beacon or push button to give confirmation that the Rectangular Rapid Flashing Beacon is in operation.
- Powered by solar cells and batteries with automatic battery charging and power control.
- Uses wireless communication to avoid trenching.
- The Rectangular Rapid Flashing Beacon is visible a minimum distance of 1000 feet during daytime and nighttime.

E. Wireless Subsystem

- Frequency in the 900 MHz FHSS range
- Range: 1 mile minimum, 3 mile maximum

F. Solar Panel Subsystem and Batteries

- Solar Panel Output: Minimum power, 14 watt or as required by the manufacturer
- Batteries: NiMH type batteries with a lifespan of 4 years minimum
- Cabinet: NEMA 4 rated fiberglass cabinet with locking clasps or approved equivalent
- Cabinet is mounted on pole behind the W11-2 sign
- Solar Panel Mount: pole mount with 45° angle bracket

G. Mounting Pole and Foundation

Provide a mounting pole and foundation designed to support the Rectangular Rapid Flashing Beacon and the associated solar panel, batteries and all equipment required to supply a complete Rectangular Rapid Flashing Beacon. Ensure the supplied pole meets the following minimum requirements:

- Install sign assembly on steel 4"fluted pole with 10' or 12' mounting height and decorative base..
- Pole, base and associated items are painted with a special order dark green color that is approved by the Engineer.
- Pole, base and associated items are to be consistent with the Perimeter Community Improvement Districts' public space standards.

Determine pole foundation dimensions based on the local conditions at the locations indicated in the Plans. Ensure the pole foundation provides a safe and secure mounting of the solar powered Rectangular Rapid Flashing Beacon Assembly.

H. Pedestrian Push Button

- Pedestrian push buttons are located perpendicular to signal indication and as required by field conditions.
- Pedestrian push buttons are located 3.5' (1.05m) above sidewalk or ground level.

Provide the Engineer with plans and drawings illustrating the mounting structure and the installed Rectangular Rapid Flashing Beacon.

999.2.01 Delivery, Storage and Handling

A. Rectangular Rapid Flashing Beacon

Provide all materials in protective packaging suitable for shipping and storage. Label all boxes with contents, including manufacturer name, model, serial numbers, and project number. Deliver assemblies to the Engineer. Maintain responsibility for all equipment prior to installation and through final acceptance.

999.3 Construction Requirements

Ensure that all construction for the equipment, materials, components and assemblies of the Rectangular Rapid Flashing Beacon Assembly conform to the manufacturer's requirements and recommendations.

Install Rectangular Rapid Flashing Beacon Assemblies at the locations indicated on the Plans. Coordinate Contractor installation activities with other utilities along the project corridor and the Engineer.

Supply mounting hardware, poles and foundations adequate for the loads and in compliance with local, state and federal building codes.

Ensure pole and all equipment are grounded in accordance with Department specifications.

999.3.01 Personnel

General Provisions 101 through 150

999.3.02 Equipment

General Provisions 101 through 150

999.3.03 Preparation

General Provisions 101 through 150

999.3.04 Fabrication

General Provisions 101 through 150

999.3.05 Construction

A. General Requirements

Install sign assembly on contractor supplied steel 4" fluted pole with a decorative base. Follow manufacturer's installation directions and comply with all local, state and federal regulations regarding the placement and installation of traffic control devices.

B. As-Built Drawings

For each installation site; furnish three (3) sets of as-built drawings, schematics, parts lists and manuals of the delivered Rectangular Rapid Flashing Beacon Assembly and submit all copies to the Engineer.

999.3.06 Quality Acceptance

A. General

Perform acceptance testing for all equipment, hardware and work provided under this Contract at each Rectangular Rapid Flashing Beacon Assembly field installation.

Obtain Engineer's approval for all test procedures prior to beginning acceptance testing.

Notify the Engineer of a desired acceptance test schedule no less than fourteen Calendar days prior to beginning testing.

Complete all work prior to the beginning of any acceptance testing at a given Rectangular Rapid Flashing Beacon Assembly site.

Complete all configuration and documentation described in Subsection 999.2 prior to the beginning of any acceptance testing at a given Rectangular Rapid Flashing Beacon Assembly site. Be prepared to demonstrate such work.

Perform all testing in the presence of the Engineer.

Have a complete copy of all materials and equipment submissions and all documentary items on hand at all acceptance testing sessions.

Demonstrate that the Rectangular Rapid Flashing Beacon Assembly equipment, hardware and work meet all requirements of the Contract including, but not limited to, all design, construction, materials, equipment, assembly, documentation of manufacturer's certification of assembly and configuration, environmental, performance, communications, video and data communications signal strength and clarity and documentary requirements of the Contract.

Perform acceptance testing of the Rectangular Rapid Flashing Beacon Assembly in two phases:

- field installation testing
- burn-in period

B. Field Installation Test

Perform the Field Installation Test as an onsite test of the complete field installation including wireless configuration testing.

Use a Laptop PC system and Rectangular Rapid Flashing Beacon control and configuration software.

Demonstrate operation of wireless configuration and sign visibility.

C. Burn-in Period

1. General Requirements

Provide a 30-day burn-in period for all work and equipment included in the Contract. The burn-in period consists of the field operation of the Rectangular Rapid Flashing Beacon Assembly in full accordance with the Rectangular Rapid Flashing Beacon Assembly requirements of the Plans and Specifications. An acceptance test procedure is not required for the system burn-in.

Conduct only one (1) burn-in period on the entire Contract. Commence with the burn-in period only after meeting all of the following requirements:

- Complete all work required in Contract documents for Rectangular Rapid Flashing Beacon Assemblies
- Verify all work has been inspected by the Engineer.
- Obtain Engineer's acceptance of Field Installation Tests for all Rectangular Rapid Flashing Beacon Assemblies
- Obtain written authorization from the Engineer to commence with burn-in period.

Terminate the burn-in period 30 consecutive days thereafter unless an equipment malfunction occurs. Stop the burn-in period for the length of time any equipment is defective. After repairing equipment so it functions properly, resume burn-in period at point it was stopped.

Successful completion and acceptance of the burn-in period will be granted on the 30th day unless any equipment has malfunctioned during the 15th through 30th day of the burn-in period. If any equipment has failed during the 15th through 30th day, final acceptance will be withheld until all the equipment is functioning properly for 15 days after repair.

When a specific piece of equipment has malfunctioned more than three times during the 30 day burn-in period, replace that equipment with a new unit and repeat the 30 day burn-in period.

2. Contractor Responsibilities

- Maintain all work under this Contract in accordance with the Specifications.
- Restore any failing or malfunctioning work or equipment to proper operating condition within 12 hours after notification.
- Pay any costs incurred as a result of emergency actions taken by the Department in accordance with Subsection 999.3.06.C.3
- Maintain any guaranties or warranties or other obligations set forth in the Contract regardless of emergency actions taken by the Department in accordance with Subsection 999.3.06.C.3
- Maintain the complete Rectangular Rapid Flashing Beacon Assembly after burn-in period acceptance in accordance with the requirements of Subsection 999.3.07 until Final Acceptance of the entire Contract.

3. Department Responsibilities

- Provide expeditious notification of Contractor upon failure or malfunction of equipment.
- Take emergency action as deemed necessary in the interest of public safety to provide for adequate traffic control in the event that the Contractor does not provide the services enumerated in the Specifications.

4. Burn-In Period Acceptance

   The Department will make burn-in period acceptance after satisfactory completion of the required burn-in period and on the basis of a comprehensive field inspection of the complete Rectangular Rapid Flashing Beacon Assembly in accordance with the Specifications.

D. Bench Acceptance Test

Not Applicable

999.3.07 Contractor Warranty and Maintenance

A. Warranty

Provide a manufacturer's support (usual and customary warranties) period for all equipment and materials furnished and installed as part of the Rectangular Rapid Flashing Beacon Assembly equipment and materials.

Transfer Manufacturer's and Contractor's warranties and guarantees to the Department. Make these warranties and guarantees continuous throughout their duration. Ensure warranties and guarantees specify they are subject to such transfer. Transfer warranties and guarantees upon Contract Final Acceptance.

B. Support

Provide phone consultations as needed during the warranty period at no cost for any operating and maintenance questions or problems.

999.3.08 Training

Provide training as required herein. Include with training all supplies, equipment, materials, handouts, travel, and subsistence necessary to conduct the training. Furnish a training notebook in a labeled 3-ring binder to each trainee. Include in the cost of training all supplies, equipment, materials, handouts, travel, and subsistence necessary to conduct the training. Provide operations and maintenance training on the equipment location. Personnel trained by the equipment manufacturers and authorized by said manufacturer shall perform the training. Training for each piece of equipment listed below shall consist of at least six (6) clock hours of training for each participant. Provide a training course for the following equipment:

A. Rectangular Rapid Flashing Beacon

Course content to include at a minimum:

- Theory of operation
- Unit set-up and configuration
- Trouble shooting
- Diagnostics and maintenance

999.4 Measurement

A. Equipment

1. Rectangular Rapid Flashing Beacon Assembly

   Rectangular Rapid Flashing Beacon Assemblies are measured per each Rectangular Rapid Flashing Beacon Assembly completed and accepted.

B. Testing

Testing is measured as a lump sum for full delivery of testing and acceptance requirements.

C. Training

Training is measured as a lump sum for all supplies, equipment, materials, handouts, travel, and subsistence necessary to conduct the training.

999.4.01 Limits

General Provisions 101 through 150

999.5 Payment

A. Rectangular Rapid Flashing Beacon Assembly

Rectangular Rapid Flashing Beacon Assemblies are paid for at the Contract Unit Price per each. Payment is full compensation for furnishing and installing the Rectangular Rapid Flashing Beacon Assembly.

Payment for Rectangular Rapid Flashing Beacon Assembly is made under:

Item No. 999	Rectangular Rapid Flashing Beacon Assembly	Per Each

B. Testing

Testing is paid for at the Contract bid price per lump sum. Payment is full compensation for full delivery of testing and acceptance requirements.

Payment for Testing is made under:

Item No. 999	Testing - Rectangular Rapid Flashing Beacon Assembly	Lump Sum

C. Training

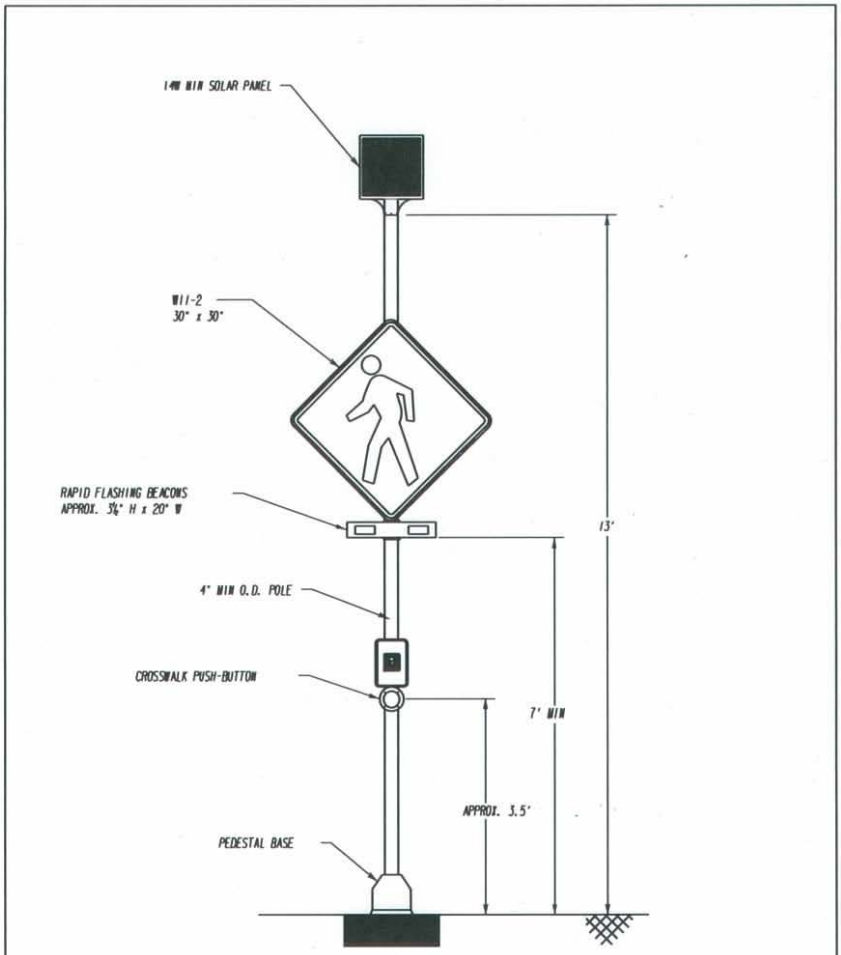
Training is paid for at the Contract bid price per lump sum for Training. Payment is full compensation for all supplies, equipment, materials, handouts, travel, and subsistence necessary to conduct the training.

Payment for Training is made under:

Item No. 999	Training - Rectangular Rapid Flashing Beacon Assembly	Lump Sum

999.5.01 Adjustments

General Provisions 101 through 150



RECTANGULAR RAPID FLASHING BEACON ASSEMBLY DETAIL
TYPICAL SIGN EXAMPLE
DETAIL DRAWING 999.3