REPORT

Bridge Foundation Exploration
SR 4 (US 1)
Over Altamaha River,
Bridge 1
BR000-0001-00(216),
P.I. NO. 0001216
Appling/Toombs Counties,
Georgia

Project Number
2012.3351.01

September 5, 2012

Revised
July 16, 2013

We're here for you
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September 5, 2012
Revised July 16, 2013

Mr. Allen Krivsky, P.E.
Heath & Lineback Engineers, Inc.
2390 Canton Road
Building 200
Marietta, Georgia 30066-5393

PROJECT: Report of Bridge Foundation Exploration
SR 4 (US 1) Over Altamaha River, Bridge 1
BR000-0001-00(216), PI NO. 0001216
Appling/Toombs Counties, Georgia
Project No. **2012.3351.01**

Dear Mr. Krivsky:

United Consulting is pleased to submit this revised Report of Bridge Foundation Exploration for the above referenced project site. This revision is based on the comments made by Georgia Department of Transportation (GDOT) Office of Materials and Testing (OMAT) under interdepartmental correspondence dated June 13, 2013 and subsequent e-mail. We appreciate the opportunity to assist you with this project and look forward to working with you on future projects. If you have any questions regarding this report, or if we can be of further assistance, please feel free to contact us.

Sincerely,

UNITED CONSULTING

GEORGIA REGISTERED No. 20064 PROFESSIONAL ENGINEER SANTANU SINHAROY

Santanu Sinharoy, P.E.
Executive Vice President - Geotechnical

Donald E. Hill, P.E.
Chief Engineer

AW/SS/DEH/nj

http://ucblade10/sites/Geotechenv/5728/2012.3351.01/Geotechnical Documents/Altamaha River/Revised/Altamaha River BFI - Rev. 7-16-13.doc

Rev. 07/16/2013

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BRIDGE FOUNDATION EXPLORATION

PROJECT NUMBER BR000-0001-00(216), Appling/Toombs Counties
P.I. NUMBER 0001216
LOCATION (See Map) SR 4 (US 1) Over Altamaha River, Bridge No. 1

GENERAL INFORMATION

GEOLOGIC FORMATION

This project is geologically sited within Stream Alluvium underlain by Neogene undifferentiated, includes Altamaha Grit, Citronelle Formation and Hawthorn Formation of the Georgia Coastal Plain Region.

SUBSURFACE FEATURES

Borings Bent 58 and Bent 59 encountered existing fill about 5 and 6 feet below grade, respectively.

The subsurface profile beneath Altamaha river bed consisted of 5 to 13 feet of alluvial soils consisting of very loose to medium dense sand or very soft to firm silty clay underlain by Coastal Plain soils. Outside this riverbed, Coastal Plain soils were generally encountered immediately below the ground surface.

The Coastal Plain soils encountered generally consisted of an occasional very soft to hard clay layer in the upper few feet overlying very loose to very dense silty or clayey medium to coarse sand with occasional gravel on top of hard sandy clayey silt and/or silty sandy clay at deeper depths.

Stabilized groundwater was measured in borings ranging from 0.5 feet to 13.6 feet below grade.

For a more precise description of the conditions encountered within the soil test borings, we refer you to the boring logs.

MAXIMUM PILE DESIGN LOADS

END BEARING = 0 %
FRICTION = 100 %

14” PSC = 60 Tons	16” PSC = 82 Tons	18” PSC = 95 Tons
20” PSC = 110 Tons	24” PSC = 138 Tons	30” PSC = 180 Tons
-	-	36” PSC = 220 Tons

FOUNDATION RECOMMENDATIONS

BENTS	DRILLED SHAFT (BEARING)	SPREAD FTG (BEARING)	PILE FOOTING (PILE TYPE)	PILE BENT (PILE TYPE)
1	-	-	-	PSC Pile

2 thru 4	0.75 ksf (Allowable skin friction)	-	-	-
5 thru 7, 9, 11, 12 and 14	0.7 ksf (Allowable skin friction)	-	PSC Pile#	-
8, 10, 13 and 14	0.7 ksf (Allowable skin friction)	-	PSC Pile*	-
15-59	-	-	-	PSC Pile

#= Alternate

*= Alternate PSC Pile with pilot holes

ELEVATIONS[1]

BENTS	BOTTOM OF DRILLED SHAFT	MINIMUM TIP	ESTIMATED TIP
1	-	96	91
2	-85 or below	-	-
3	-85 or below	-	-
4	-85 or below	-	-
5	-50 or below	45[2]	27
6	-55 or below	45[2]	26
7	-45 or below	45[2]	29
8	-35 or below	45[3]	30
9	-45 or below	45[2]	30
10	-50 or below	45[3]	30
11	-50 or below	45[2]	28
12	-50 or below	45[2]	33
13	-45 or below	45[3]	36
14	-45 or below	45[3]	32
15	-	45	32
16 and 17	-	45	26
18 and 19	-	45	26
20 and 21	-	45	30
22 and 23	-	45	26
24 and 25	-	45	30
26 and 27	-	45	26
28 thru 37	-	45	27
38 and 39	-	45	35
40 and 41	-	45	26
42 thru 45	-	45	23
46 and 47	-	45	24
48 and 49	-	45	33
50 and 51	-	45	38
52 and 53	-	45	22
54 and 55	-	45	25
56 and 57	-	45	25
58	-	45	25
59	-	55	33

[1] = See note under ‘Drilled Shafts’ for specific diameters used

[2] = Alternate

[3] = Alternate PSC Pile with pilot holes

ADDITIONAL DRILLED SHAFT RECOMMENDATIONS

Material Type	SPT	Unit Wt. (pcf)	Long- Term Cohesion (psf)	Friction Angle (ϕ)	Lateral Subgrade Modulus (tcf)
Very Loose Sand	0 - 5	110	0	22° - 28°	20
Loose Sand	5 - 10	110	0	28° - 30°	35
Medium Dense Sand	11 - 24	120	0	30° - 34°	75
Dense Sand	25 - 50	130	0	34° - 41°	130
Very Dense Sand	> 50	130	0	41° - 43°	200
Very Soft Clay	0 - 1	1	0-250	0°	5
Soft Clay	2 - 4	110	250-500	0°	10
Medium Stiff Clay	5 - 8	110	500-1000	0°	15
Stiff Clay	9 - 15	120	1000-2000	0°	25
Very Stiff Clay	16 - 30	120	2000-4000	0°	50
Hard Clay	31 - 60	130	4000-8000	0°	70
Very Hard Clay	> 60	130	8000+	0°	100

NOTES

Elevations All elevations are based on a benchmark elevation of 96.68 feet at station 88+16.92, 45.22 feet left of centerline on northwest end corner of existing bridge.

PDO Driving resistance after Minimum Tip Elevations are achieved.

Waiting Period A waiting period of 30 days will be required before the driving of piles at the endbent 59 to allow for the settlement of the relatively loose underlying soils.

Theoretical Scour Appears feasible for the material encountered.

Erosion We concur with the use of 24 inches of Type I riprap and filter fabric at End Bent 59.

Spudding/Jetting Spudding and/or Jetting may be required to achieve the Minimum Tip Elevations for PSC piles at proposed intermediate Bents 15 through 58.

Pre-drilling The Contractor may choose pre-drilling as an option to spudding or jetting to assist in the installation of PSC piles through dense soil layers at Bents 15 through 58 as per Special Provision Section 520. If pre-drilling is used, it should be to an elevation of 65 feet.

No separate payment will be made if the Contractor chooses to use pre-drilling. The maximum diameter of the pre-drilled hole should be determined from the following table:

Pile Size - PSC	Maximum Pre-Drill Hole Size - PSC
14“	12“
16”	18“
18“	18“
20“	24”
24“	24“
30“	30“
36“	36”

Pilot Holes Very dense sands and hard clay layers were encountered above the minimum tip elevations for pile footings at Bents 8, 10, 13 and 14. We recommend that pilot holes be set up to elevation 65 to assist in the installation of PSC piles through these soil layers. The elevations may be adjusted by the Engineer during construction.

Pile Size - PSC	Maximum Pilot Hole Size - PSC
14“	18“
16”	18“
18“	24“
20“	24”
24“	30“
30“	36“
36“	48”

Freeze Bearing Piles should not be overdriven at this site. If dynamic bearing has not been achieved by 2 feet above the Estimated Tip Elevation, pile driving should be stopped for a minimum of 24 hours and re-started with a warm hammer to check for “freeze” bearing.

Pile Footings Due to the high groundwater elevations near the footing elevations, we recommend that 12 inches of Type II Foundation Backfill Material be set up at Bent 5 for use in the footing area. The use of this material should be at the direction of the Engineer and may be eliminated on construction if the footing area is dry.

Drilled Shafts The drilled shafts should be constructed as per Special Provision Section 524: Drilled Caisson Foundations. Drilled shafts are recommended as the foundation type for Bents 2 through 14 at this site because they will eliminate the need for pilot holes and/or cofferdams.

The drilled shafts shall be constructed to the tip elevations as stated above. All drilled shaft tip elevations for drilled shafts were calculated based on drilled shafts’ diameters of 5.5 feet and 4 feet for Bents 2 through 4 and Bents 5 through 14, respectively.

Permanent Casing Permanent casing will be required at Bents 2 through 5 to install the drilled shafts at this site. Permanent casing may also be needed for Bents 6 through 14 to similar elevations below and adjusted by the engineer due to possible flooding at time of construction. Casing will be required to elevations as listed below:

Bents	Elev. (ft)
2 thru 4	30
5	35

Load Test A full-scale load test shall be performed on a drilled shaft of larger design size (i.e., 5.5 ft. dia.) adjacent to Bent 11 to verify the design parameters.

Test Piles Due to the length of the bridge, we recommend setting up 7 test piles at Bent 1, 6, 20, 38, 44, 52 and Bent 59 to help determine pile order lengths. They should be of sufficient length to reach a depth of 5 feet below the Estimated Tip Elevation.

Special Problems Erratic Pile lengths can be expected.

As Built Foundation Information The as built foundation information should be forwarded to the Geotechnical Engineering Bureau upon completion of the foundation system.

LIMITATIONS This report is for the exclusive use of the Heath & Lineback Engineers, Inc., Georgia Department of Transportation, its agents, and the designers of the project described herein, and may only be applied to this specific project. Our conclusions and recommendations have been prepared using generally accepted standards of Geotechnical Engineering practice in the State of Georgia. No other warranty is expressed or implied. Our firm is not responsible for conclusions, opinions or recommendations of others.

The scope of this evaluation was limited to an evaluation of the load-carrying capabilities and stability of the subsoils. Oil, hazardous waste, radioactivity, irritants, pollutants, molds, or other dangerous substance and conditions were not the subject of this study. Their presence and/or absence are not implied or suggested by this report, and should not be inferred.

Our preliminary conclusions and recommendations are based upon design information furnished us, data obtained from current exploration and testing program and our past experience. They do not reflect variations in subsurface conditions that may exist intermediate of our borings and in unexplored areas of the site. Should such variations become apparent during construction, it will be necessary to re-evaluate our conclusions and recommendations based upon “on-site” observations of the conditions.

If the design or location of the project is changed, the recommendations contained herein, must be considered invalid unless our firm reviews the changes and our recommendations are either verified or modified in

writing. When design is complete, we should be given the opportunity to review the foundation plan and applicable portions of the specifications to see if they are consistent with the intent of our recommendations.

Prepared By Anry Wijaya

Reviewed By Santanu Sinharoy, P.E.

QC Reviewed By Donald E. Hill, P.E.

Revised: November 15, 2003

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

SPECIAL PROVISION

PROJECT NO. BR000-0001-00(216), APPLING/TOOMBS COUNTIES
P.I. NO. 0001216

SECTION 520—PILING

Add the following to Subsection 520.3.05.G:

At the Contractor's option, predrilling may be used to loosen dense soil layers to assist in the installation of piling in lieu of spudding or jetting. To predrill, drill an auger into the ground to the required elevation at the pile location. It is not necessary to remove all material or to provide casing. Use one of the following maximum auger diameters corresponding to the pile size:

PSC Pile Size	Maximum Pre-drill Auger Size
14“ (350 mm)	12” (300 mm)
16” (400 mm)	18” (450 mm)
18” (450 mm)	18” (450 mm)
20” (500 mm)	24” (600 mm)
24” (600 mm)	24” (600 mm)
30” (750 mm)	30” (750 mm)
36” (900 mm)	36” (900 mm)

There will not be any separate payment made for predrilling.

Office of Materials and Testing

Revised November 9, 2006

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

SPECIAL PROVISION

PROJECT NO. BR000-0001-00(216), Appling/Toombs Counties
P.I. NO. 0001216

SECTION 524 – DRILLED CAISSON FOUNDATIONS

524.1 General Description

This Work consists of furnishing all labor, materials, equipment, tools and services necessary for construction of drilled caisson foundations and includes all incidentals and additional work in conjunction therewith. Adhere to the Department's Plans, Special Provisions and Standard and Supplemental Specifications for all Work.

524.2 Materials

Use materials that meet the requirements of the Standard Specifications with the following exceptions:

- Use non-air-entrained Class AA concrete with a coarse aggregate size of No. 67 stone and a slump at time of placement of between 7 and 9 inches (175 and 225 mm). Use 10 percent additional cement and a retarder or water reducing agent in all concrete.
- Use Grade 60 (Grade 420) reinforcing bars that conform to ASTM 615 (ASTM A 615M). If wire spirals are used, use spirals that conform to ASTM A 82.
- Use Grade 2 steel casing that conforms to ASTM A 252.
- Use water that conforms to Section 880 of the Standard Specifications.

524.3 Construction Requirements

524.3.01 Personnel

Construct drilled caissons and supervise the work with personnel who are experienced in this type work. Visit and examine the work site and all conditions, and take into consideration all such conditions that may affect the work. At least thirty days prior to beginning drilled caisson work, submit to the Engineer for review and approval the following proof of the ability of the personnel to construct drilled caisson foundations:

1. Evidence of the successful completion of at least five projects similar in concept and scope to the proposed foundation. Include names, addresses and telephone numbers of the owners' representatives for verification.

2. Résumés of foreman and drilling operators to be employed on this project. Provide evidence showing that the drill operator has experience and knowledge of the drill rig to be used on the project. The Department will be sole judge of the qualifications of the foreman and drill rig operator.

3. A detailed sequence of construction for drilled caisson work that describes all materials, methods and equipment to be used, including, but not limited to the following:

    - casing sizes with proposed top and tip elevations
    - drilling equipment including the manufacturer's specifications on the drill rig
    - methods and equipment for stabilizing and cleaning shaft excavations
    - methods of materials handling and disposal
    - methods and equipment for placing concrete
    - equipment to mix, circulate, contain and de-sand slurry
    - details of tremie or pump line sealing methods
    - details of reinforcement placement, including support and centralization methods

Do not begin drilled caisson construction until the qualifications, construction plan and methods have been approved in writing by the Engineer.

524.3.02 Sequence of Events

1. After the Engineer's acceptance of the qualifications and methods, and prior to construction, attend a meeting with the Engineer to review specifications, discuss

details of construction methods and equipment, review contingency plans in the event that problems occur, and other issues.

2. Prior to construction of the load test caisson, demonstrate the adequacy of methods, materials and equipment on a demonstration caisson (5.5 feet in diameter) that will not become part of the completed structure. Excavate this demonstration caisson with the same tools, methods, slurry type, and to the same diameter and maximum depth of the production caissons. Use the same type reinforcing cage and same type slurry that will be used on the load test and production caissons. Do not leave casing in place unless permitted by the Engineer. Construct this demonstration caisson at Bent 2, 3 or 4 no closer than five caisson diameters to the existing and proposed bridge foundations, and no further than ten caisson diameters from the existing and proposed bridge foundations, and to an Elevation -85.

   Include all costs of materials and labor required to construct these caissons in the price bid for demonstration caissons.

3. Prior to constructing the production caissons, perform a load test on a non-production load test caisson. Construct the load test caisson (5.5 feet in diameter) with the same tools, reinforcement, stabilization and excavation methods, and to the same diameter of the production caissons. Construct the load test caisson at Bent 11, no closer than five caisson diameters to the existing or proposed bridge foundations, and no further than ten caisson diameters from the existing or proposed bridge foundations, and to an Elevation **-26.** Install the bottom and mid-range cells at Elevations **-25** and **+2** respectively.

   Include all costs of materials and labor required to construct and test the load test caisson in the price bid for load test caissons.

4. If the demonstration or load test caisson(s) are constructed in a river, lake, or other open body of water, reinforcement and concrete will not be required above the river or lake bed elevation.

5. After the Engineer has accepted the results of the load tests and set the tip elevations of the production caissons, begin construction of the caissons as detailed in the Plans and Specifications. The Engineer will set the tip elevations of the production caissons no later than fourteen calendar days after receiving the completed load test report.

524.3.03 Equipment

Use excavation and drilling equipment with a rated capacity (including power, torque and downward thrust) to excavate a caisson of the maximum specified diameter to a depth of 30 feet (9.1 meters) or 20 percent deeper than the deepest production caisson indicated on the Plans, as measured from the ground or high water surface elevation, whichever is higher.

524.3.04 Casing

Use casings if the elevation of the top of the caissons is at or below the ground or expected high water elevation at any time during construction. If casings are used, set the elevation at the top of the casing a minimum of 2 feet (600 mm) above the ground or 4 feet (1200 mm) above the expected high water elevation at the site, whichever is greater. Cut off any permanent casing used as shown on the Plans.

Use casing that is a metal shell of a thickness to withstand handling, internal and external pressures, and that is watertight, smooth and clean. If the elevation of the top of the caisson is below ground level or water level at the time of concrete placement, use an oversize casing from ground elevation to a point below the top of the caisson to prevent soil from caving into the fresh concrete. Do not allow the top of the permanent casing, if required, to extend above the top of the drilled caisson. Use casing in all materials that do not have sufficient strength to safely remain open and stable during and after excavation.

When casing is used, do not use casing with an outside diameter less than the specified diameter of the caisson. That portion of the caisson below the casing may be slightly smaller than the normal outside diameter of the caisson. However, use drilling tools to excavate the caisson below the casing that are no smaller than the Plan diameter of the caisson minus 2 inches (50 mm). Do not leave casing in place unless permitted by the Engineer, and cut off any permanent casing as shown on the Plans.

Provide adequate equipment during concrete placement to prevent pulling up the reinforcing cage during casing extraction. The casing may be pulled in partial stages. Maintain a sufficient head of concrete above the bottom of the casing to overcome hydrostatic pressure. Extract the casing at a slow uniform rate with pull in line with the center of the caisson.

In open-water locations, provide containment at the top of the casing to prevent any material from spilling into the water. Install casing to a depth and in a manner that will produce a positive seal at the bottom of the casing. Do not allow water or other materials, into or out of the excavation area at or below the bottom of the casing.

Do not leave casings in place unless permitted by the Engineer. If casings that are to be removed become bound in the caisson excavation and cannot be practically removed, or if the permanent casing is lowered below the proposed tip elevation, drill the caisson excavation deeper and extend the caisson, including reinforcement, as directed by the Engineer to compensate for loss of capacity due to the presence of the casing. No compensation will be made for the casing remaining in the excavation. The additional length of caisson including excavation, reinforcing steel, concrete and other items incidental to the Work will be paid for at the unit bid price for drilled caissons.

524.3.05 Slurry

Use temporary full-depth casings, mineral or polymer slurry on this project to maintain the stability of the excavations. Manufacture mineral slurry from processed, high-sodium bentonite clays. Use polymer slurry that conforms to the manufacturer's recommendations, that is site specific, and has been used successfully on a minimum of ten projects of similar size and scope. Adjust the percentage and specific gravity of the slurry used so that the stability of the excavation is maintained, and to allow for proper placement of the concrete.

When using mineral slurry, adhere to the following requirements:

1. Premixing: Mix the mineral slurry thoroughly in a clean, separate tank using clean water that meets the requirements of Section 880 of the Standard Specifications prior to placing the slurry in the excavation. Mix the mineral slurry with high-speed pumps for the time recommended by the manufacturer to allow for its complete hydration.

2. Testing: Provide the equipment necessary to sample the slurry at the bottom of the shaft and provide the equipment and materials to perform viscosity, density, pH and sand content tests on these same slurry samples. Perform all tests in the presence of the Engineer. Perform the viscosity, pH and density tests on the slurry taken from the mixing tanks prior to the introduction of the slurry into the excavation.

Conduct all tests at the end of each workday after drilling is completed and at the beginning of each workday before drilling resumes. Perform these tests on slurry samples collected from the depths and at the times determined by the Engineer to ensure that the slurry within the entire excavation meets these Specifications.

Perform sand content tests on slurry samples taken from the bottom of the shaft after placement of the reinforcing cage, but immediately before pouring concrete. Do not place concrete until all testing produces acceptable results.

a. Viscosity: Produce slurry with a viscosity within the range of 30 to 45 seconds per quart (32 to 48 seconds/liter), as measured by the Marsh Cone Method.

b. Density: Produce slurry with a density within the range of 66 to 73 pounds per cubic foot (1060 to 1170 kilograms per cubic meter). If the sidewalls are unstable, or if artesian flow is present, use a weighing additive to increase the density.

c. pH: Produce slurry with a pH within the range of 8 to 11. The pH of the mineral slurry may be adjusted with the use of soda ash.

d. Sand Content: Measure the sand content of the slurry at the bottom of the shaft by the sand content test just prior to concrete placement. When the sand content at the bottom of the shaft exceeds 4%, clean the bottom of the shaft using desanding or other equipment that is approved by the Engineer.

When using polymer slurry, adhere to the following requirements:

1. Submittals: A minimum of 30 working days prior to the use of polymer slurry, submit the following information to the Engineer:

a. A list of ten projects and locations where the polymer slurry has been successfully used on projects of similar size and scope.

b. Project owner names and contact phone numbers

c. Diameter and depth of drilled caissons used on these projects.

Do not use the polymer slurry until the Engineer has reviewed and approved the submittal in writing.

2. Manufacturer's Representative: Ensure that a representative of the polymer slurry manufacturer is on site to provide assistance and guidance with the construction of the test excavation (if applicable), the demonstration caisson (if applicable), the load test caisson (if applicable), and the first two production caissons. Ensure that this representative is also available for on-site assistance if problems with the polymer slurry are encountered with the construction of the remaining production caissons. The cost of all on-site assistance and representation will be considered incidental to the cost of the drilled caissons.

3. Premixing: Mix the polymer thoroughly in a clean, separate vessel using clean water that meets the requirements of section 880 of the Standard Specifications prior to placing the slurry in the excavation. Add polymer to water flowing through a hose, across a stationary surface into a vessel. Mix the polymer for the time recommended by the manufacturer to allow the polymer to develop adequate viscosity to be self-suspending.

4. Testing: Provide the equipment necessary to sample the polymer slurry from the bottom of the excavation, from the upper portion of the excavation, and from the slurry supply tank or vessel at regular intervals during the excavation process. Provide the equipment and materials needed to perform density, viscosity, pH, and sand content tests on these slurry samples. Perform all tests in the presence of the manufacturer's representative and the Engineer. Perform the viscosity, pH and density tests on the polymer slurry taken from the mixing tank or vessel prior to the introduction of the polymer slurry into the excavation. After the polymer slurry is in the excavation, perform all tests (i.e. viscosity, density, pH, and sand content) at the bottom and at the upper section of the excavation, at intervals determined by the Engineer. Maintain written records, showing viscosities, pH values, densities, sand content, times, dates, and depth or locations from which samples were taken.

Perform sand content, density, viscosity, and pH during the static period (the period when the polymer slurry is stabilized and shows no further change over a 30-minute interval during which the excavation is completely static), from mid-point of the excavation and from within 24" (610 mm) of the bottom. Do not place concrete until all testing produces acceptable results as follows:

a. Viscosity: Produce polymer slurry with a viscosity within the range of 30 to 125 seconds/quart (32 to 132 seconds/liter) during drilling and less than or equal to 60 seconds/quart (63 seconds/liter) just prior to placing concrete, as measured by the Marsh Cone Method.

b. Density: Produce polymer slurry with a density within the range of 64 lb/ft^3 (1025* kg/m^3) to 67 lb/ ft^3 (1073* kg/m^3). A weighing additive may be used to increase the density of the polymer slurry if the sidewalls are unstable or if artesian flow is present.

c. pH: Produce polymer slurry with a pH within the range of 8 to 11. The pH of the mix water may be adjusted with the use of soda ash.

d. Sand Content: Measure the sand content of the polymer slurry from the bottom and from the upper portion of the excavation just prior to concrete placement. When the sand content at the bottom of the shaft exceeds 1%, clean the bottom of the shaft using desanding or other equipment that is approved by the Engineer.

* When approved by the Engineer, slurry may be used in salt water, and the allowable densities may be increased by 2 lb/ft^3 (32 Kg/m^3).

Use slurry with a temperature of at least 40^o F (4.4^o C) during testing.

524.3.06 Protection of Existing Structures

Monitor structures for settlement that are within a distance of ten shaft diameters or the estimated shaft depth, whichever is greater, in a manner approved by the Engineer. Record elevations to an accuracy of .01 foot (3 mm). Record elevations before construction begins, during the driving of any required casings, during excavation or blasting, or as directed by the Engineer.

Document thoroughly the condition of the structures with descriptions and photographs made both before and after drilled caissons are constructed. Document all existing cracks, and provide copies of all documentation to the Engineer.

At any time settlement of .05 foot (15 mm) or damage to the structure is detected, immediately stop the source of vibrations, backfill any open drilled shaft excavations and contact the Engineer for instructions.

524.3.07 Excavation

Drill and excavate all caissons through whatever substances and to the elevations required. Excavate near the tip elevation in the presence of the Engineer. Stabilize all excavations with slurry to control the excavation diameter and prevent sidewall sloughing, cave-ins or excessive sediment build-up on the excavation bottom. Provide the stabilization prior to excavation.

Use the same tools, stabilization and excavation methods on the production caissons that were used on the accepted demonstration caisson. Construct additional demonstration excavations with no additional cost to the Department, and with no increase in contract time if any changes are made in the tools, excavation and stabilization methods on production caissons from those methods previously demonstrated and accepted.

When casing is not specifically required on the Plans, fill in any over-excavation with Class AA concrete at no additional cost to the Department. Dispose of excess concrete, grout, displaced water and materials removed from the caisson excavation in areas approved by the Engineer, and in accordance with any Federal, State, or local code or ordinance. Verify the accuracy and existence of all applicable codes, ordinances or other regulations prior to disposing materials.

Maintain the fluid level within the casing at a minimum of 4 feet (1.2 meters) above the level of the expected high water elevation or hydrostatic pressure head, whichever is greater, at all times so that unbalanced hydrostatic and/or soil pressures will not cause the collapse of the drilled caisson sidewalls or bottom. In the event of a sudden and/or significant loss of fluid in the excavation, stop construction until a method to stop fluid loss, or until an alternate construction procedure, has been approved by the Engineer.

Conduct excavation near the tip elevation in the presence of the Engineer for determination of the quality of materials encountered. The Engineer will inspect and approve the bottom of each shaft prior to setting the reinforcing cage and pouring concrete. The Engineer may adjust the caisson tip elevation if unsuitable foundation conditions are encountered at the plan tip elevation. Clean the bottom of the excavation so that it is firm, level, and free of sediment or debris. Use a bailing bucket, air lift, or submersible pump to perform the final cleaning of the excavation.

If the excavation below casing remains open for more than 18 hours, over-ream the sides of the excavation with a grooving tool, over-reaming bucket, or other approved equipment to increase the shaft radius a minimum of ½ inch (12 mm) and a maximum of 3 inches (75 mm). Perform the over-reaming and provide and place additional concrete required at no additional cost to the Department, and with no increase in Contract time.

Do not allow any excavation below casing to remain open longer than 36 hours without commencing concrete placement.

524.3.08 Reinforcing Steel

Assemble a cage of reinforcing steel and place it as a unit immediately prior to concrete placement. Assemble the cage so that the clearance between the cage and side of the caisson will be at least 5 inches (125 mm), and the clearance between the cage and bottom of the caisson will be 3 inches (75 mm).

If the caisson is lengthened, extend all reinforcement to within 3 inches (75 mm) of the bottom. If a splice is required, place it in the lower one-third of the caisson, or as

shown on the Plans. Tie hoops or spirals to the caisson and column steel (vertical bars) at 100% of the junctions with double wire figure-eight ties. Do not weld the reinforcing steel. Support the cage from the top in a concentric manner to minimize its slumping downward during concrete placement and/or extracting of the casing.

Check the elevation of the top of the steel cage before and after casing extraction. Any upward movement of the steel not exceeding 2 inches (50 mm) or any downward movement thereof not exceeding 6 inches (150 mm) will be acceptable. Any upward movement of the concrete or displacement of the steel beyond the above limits will be cause for rejection. Tie and support the reinforcing steel in the caisson so that the reinforcing steel will remain within allowable tolerances. Provide all temporary or permanent cage stiffeners, braces, helical ties, jigs, or bands that are required to maintain cage stiffness and shape during the assembly, lifting and placement of the reinforcement cage.

In uncased caissons, use only heavy-duty plastic rollers (wheels). In cased caissons, use heavy-duty non-corrosive plastic rollers (wheels) or steel chairs. Place rollers at a maximum interval of 8 feet (2.4 meters) along the cage to ensure concentric spacing for the entire cage length. Use one roller for each 1 foot (300 mm) of diameter of the cage, with a minimum of four rollers at each interval. Do not use concrete spacer blocks. Use rollers that are constructed of a material approved by the Engineer and that have sufficient bearing surface to provide lateral support to the reinforcing cage.

Use rollers of adequate dimension to provide the annular spacing between the outside of the reinforcing cage and the side of the excavated hole or casing as shown on the Plans. If an oversize casing is used, use rollers that will provide concentric spacing. Use pre-cast concrete or heavy-duty plastic bottom supports (feet/boots) to provide a spacing of 3 inches (75 mm) between the cage and caisson bottom.

524.3.09 Concrete

Mix and place all concrete in accordance with Section 500 of the Specifications where applicable and the requirements herein stated. Place concrete as soon as possible after all excavation is completed and reinforcing placed and supported. Place concrete continuously in the caisson to the top elevation of the caisson.

Place concrete using a gravity feed watertight tremie consisting of a pipe at least 8 inches (200 mm) in diameter with a hopper at the top. Concrete may be placed by pumping through a supply line if the Engineer approves this method. Provide a pump supply line with sections that have watertight couplings. Prevent concrete from mixing with fluid from the excavation within the tremie or pump supply line by sealing the end of the line with a foam plug or other device approved by the Engineer.

At the beginning of concrete placement, place the tremie on the bottom of the excavation until the tremie pipe and hopper are filled with concrete. Raise the tremie only enough to induce concrete flow and do not lift it further until the discharge end is immersed at least 10 feet (3 meters) into the deposited concrete. If concrete placement

by pumping is used, secure the supply line in place so that the discharge end will not lift off the bottom of the excavation more than 6 inches (150 mm) until at least 10 feet (3 meters) of concrete has been placed. Embed the discharge end of the tremie or pump supply line in the concrete a minimum of 10 feet (3 meters) throughout the remainder of the concrete pour.

Place concrete continuously in the caisson to the top elevation of the caisson until good quality concrete is evident at the top of the caisson, to the satisfaction of the Engineer. Remove any concrete that becomes contaminated with slurry, soil, or other deleterious materials near the top of the caisson and replace it with uncontaminated concrete or chip the contaminated concrete back to sound concrete after the concrete has dried at no additional cost to the Department.

Once concrete placement in the caisson has begun, place all concrete in the caisson within two hours. Adjust the retarder or water reducing agent as approved by the Engineer, for the conditions encountered on the job so that the concrete remains in a workable plastic state throughout the pour. If a longer placement time is needed, provide a concrete design mix that will maintain a minimum 4 inches (100 mm) slump over the longer placement time, as demonstrated by a trial mix and slump loss test to the satisfaction of the Engineer. Repeat the slump loss test as directed by the Engineer when there is an increase of more than 10° Fahrenheit (5.5º Celsius) in ambient temperature from when the trial mix and slump loss tests were performed.

Prepare and cure the top surface of the caisson in accordance with the requirements of Section 500. Locate construction joints as indicated on the Plans. Provide a plan to the Engineer of how the concrete is to be placed and protected at the cut-off elevation to ensure that good quality concrete is placed at the top surface of the caisson. Do not place concrete until the Engineer has approved this plan. Provide a sump to channel displaced water away from the caisson. Do not discharge concrete, contaminated fluids, slurry, soil, or rock into any body of water.

During the twenty-four hour period immediately following the completion of the placement of concrete in the caisson, do not install or extract casing within 50 feet (15 meters) of the completed caisson, and do not excavate any caissons within 15 feet (4.5 meters) of the completed caisson. If the Engineer determines that any construction adversely affects the recently constructed caisson, cease such activities immediately.

Protect any portion of drilled caissons exposed to a body of water from the action of water by leaving the forms in place for a minimum of seven days after pouring the concrete. Remove the forms prior to seven days only if the concrete strength has reached 3000 psi (21 MPa) or greater as tested by cylinder breaks.

524.3.10 Inspection

Provide equipment for checking the dimensions and alignment of each caisson excavation. Check the dimensions and alignment of the excavations in the presence of the Engineer.

524.3.11 Tolerances

Adhere to the following construction tolerances for drilled caissons:

1. Construct the drilled caisson to within 3 inches (75 mm) of the plan position plane, at the top-of-caisson elevation. Adhere to a vertical alignment tolerance of ¼ inch (6 mm) per 12 inches (300 mm) of depth.

2. Place reinforcement in accordance with the requirements of Section 511 of the Standard Specifications and Sub-section 524.3.08. Tie column steel (vertical bars) to hoops and spirals at 100% of the junctions with double wire figure-eight ties.

3. Placed vertical caisson reinforcing bars, including bars extending into columns or footings to within ¼ inch (6 mm) of plan location. Place hoops or spirals to within 1 inch (25 mm) of their specified location. Adhere to a side form clearance of within ¼ inch (6 mm) of plan requirements.

4. Place the construction joint of the top of caissons used as caisson/column intermediate bents to within a tolerance of plus or minus 3 inches (75 mm) of the plan elevation.

5. Provide additional materials and labor necessary to correct out-of-tolerance caissons at no cost to the Department and with no increase in contract time.

524.4 Acceptability

In the event that significant voids are suspected in the concrete that were created during placement, verify the integrity of the caisson using a method that has been approved by the Engineer. If the caisson in question is found to be structurally deficient or out of tolerance in any way, the caisson will not be accepted unless corrective measures as approved by the Engineer are accomplished. Furnish additional materials and work necessary to effect corrections at no cost to the Department and with no increase in contract time.

524.5 Load Test

1. Description: This Work consists of furnishing all labor and materials necessary to conduct a bi-directional load test and to report the results to the Department. Obtain the services of an instrument supplier approved by the Department to conduct the load test. Submit proof that the instrument supplier has successfully conducted at least five load tests using the bi-directional test device (Osterberg Cells or equal) to the Engineer. Use the bi-directional load test device to test separately the shear resistance and end bearing of the caisson by loading the caisson in two directions (upward-shear resistance, downward-base shear and/or end bearing) or by loading the caisson using other approved methods capable of full separation of the upward shear and downward shear and downward base shear and/or end bearing. Use bi-directional test devices that are capable of applying a load of at least **3,000** tons (30 MN) at the location of the mid-range cell and **3,000** tons (30 MN) at the location of the bottom cell.

Conduct the load test in conjunction with the instrument supplier and supply material and labor before, during, and after the load test. Instrument the load test caisson as per Sub-section 524.6 (see Figure Nos. 1 and 2 for information). After the completion of the load test, cut off any portion of the caisson to a depth of 12 inches (300 mm) below stream bed elevation.

The tip elevations of the production caissons may be raised or lowered by the Department and will be set by the Engineer based on the results of the load tests no later than fourteen calendar days after the Engineer receives and accepts the completed load test reports.

2. Materials: Supply all materials required to install the load cells and conduct the load test, including, but not limited to the following:

a. Two **3,000** ton (30 MN) load cells of the same size for the load test.

b. Fresh water from a source approved by the Engineer for mixing water-soluble oil provided by the instrumentation supplier to form the hydraulic fluid used to pressurize the load cell.

c. Materials sufficient to construct a stable reference beam system for monitoring the deflection of the caisson during testing. Support the reference beam system at a minimum distance of three diameters from the center of the caisson to prevent the beam's disturbance. Where space is restricted, two good-quality, self-leveling surveyor's levels may be used to monitor the caisson movements. In open water areas, protect or brace the test caissons and reference caissons against wave and current action.

d. Materials sufficient to construct a protected area (including provisions such as a tent or shed for protection of the load test equipment and personnel from inclement weather) of size and type required by the Engineer.

e. Electrical power as required for lights, instruments, welding, etc.

f. A beam or pipe system as required by the instrument supplier to support the placement of the load cell and instrumentation pipes and wires when a caisson rebar cage will not be used.

g. Remove materials from the load test caisson at the conclusion of the load test.

3. Equipment: Supply the equipment required to install the load cells, conduct the load test, and remove the load test apparatus as required, including, but not limited to the following:

a. Welding equipment and certified welding personnel, as required, to assemble the test equipment, attach pipes and fittings to the load cells, and prepare the work area.

b. Air compressor of minimum 150 CFM (4.2 CMM) to activate the pump.

c. Cranes or other lifting device for handling the load cells, pipes, and reinforcing cage or alternate instrument support system during the installation of the load cells during the performance of the testing.

d. Equipment and labor sufficient to erect the protected work area and monitoring reference beam system, constructed to the requirements of the Engineer.

e. Suitable operating and reference level platforms, as required for testing over water or in otherwise unstable foundation conditions. Submit to the Engineer for review and approval, a plan for the reference beams and platform system to be used during the load test at least two weeks prior to conducting the load test.

4. Procedure: Construct the load test caisson using the approved caisson installation techniques. Assemble the load cells, pipes and other attachments under the direction of the instrument supplier

Place the load cell assemblies at the bottom of the load test caisson and at other specified locations on the cage. Welding of the rebar to the load cell is permissible.

After the load test caisson excavation has been constructed, inspected and accepted by the Engineer, place a quantity of concrete or grout approximately 6 inches to 12 inches (150 to 300 mm) thick at the base of the caisson by a method approved by the Engineer. Install the load cells and the reinforcing cage assembly in the test shaft under the direction of the instrumentation supplier and the Engineer so that the bottom load cell is resting firmly in/on the concrete/grout bed. Use the utmost care in handling the

rebar cage/test equipment assembly so as not to damage the instrumentation during installation. Alternatively, lower the load cells and reinforcing cage assembly as one unit to the near-bottom of the shaft and place a bed of concrete 6 inches to 12 inches (150 to 300 mm) thick placed through a slick line using a concrete pump.

After installation of the load cells, place the concrete in the caisson in the manner specified for similar production caissons. Do not conduct the load test until the minimum compressive strength of the concrete is 3000 psi (21 MPa), as indicated by cylinder breaks. Type III high early cement may be used in the mix to reduce the time between placing concrete and testing if approved by the Engineer

During the period required to perform the load test, do not vibrate casings into place in the foundation area near the load test. However, drilling may continue, provided that such drilling is for caissons located approximately 50 feet (15 meters) or more from the work area. If test apparatus show any signs of negative effects due to construction activities, cease such activities.

After the completion of the load test, and at the direction of the Engineer, remove any equipment, material, waste, etc.

5. Report: Supply the Engineer with five copies of a report of the load test within three calendar weeks after completion of the load test, as prepared by the instrumentation supplier or others approved by the Engineer.

524.6 Load Test Instrumentation Requirements

1. Description: This Work consists of furnishing strain gauges and rod tell-tales, as noted herein, for use in monitoring the load test. Provide and install the gauges and rod tell-tales at the locations directed by the Engineer. Provide shelter over the load test location to protect the gauges and other instrumentation from inclement weather. Replace any instrumentation devices damaged at no additional cost to the Department.

2. Materials: Provide the following type and number of strain gauges and rod tell-tales for the load test:

a. Twelve vibrating wire embedment strain gauges set to measure compression that read to a maximum strain range of at least 3000 microstrains with a sensitivity of 1 microstrain. Provide waterproof gauges supplied with shielded multi-conductor electric cable, and with two connection devices or fasteners of a suitable type to securely join the gauges to a longitudinal reinforcement bar of the drilled caisson rebar cage. Provide access to the drilled caisson rebar cage to allow the instrument supplier to install the strain gauges.

   Install the gauges at intervals of approximately equal spacing throughout the rebar cage, or at the locations directed by the Engineer. Supply sufficient lengths of cable

for each gauge to reach from the gauges to approximately 30 feet (10 meters) beyond the top of the casing.

Perform the monitoring of the strain gauges during the load test. Provide a copy of all the readings to the Engineer at the completion of the load test.

b. Provide six rod tell-tales to measure movement within the drilled caisson. Use rod tell-tales consisting of $^{5}/_{16}$ inch (8 mm) diameter flush-jointed stainless steel threaded rods that can be connected by means of standard threading couplings. Encase the tell-tales within a minimum ½ inch (12 mm) diameter (ID) steel threaded pipe or ¾ inch (19 mm) diameter (ID) PVC flush-joint pipe. Provide and install the PVC or steel pipe. Install the tell-tales at the following points on the rebar cage, or as directed by the Engineer:

   i. Two (2) each at three-quarters of the caisson length from the top.
   ii. Two (2) each at the midpoint of the caisson.
   iii. Two (2) each at one-fourth of the caisson length from the top.

Install and monitor the rod tell-tales. Provide a copy of all the readings to the Engineer at the completion of the load test. Remove the stainless steel rod tell-tales at the completion of the load test.

524.7 Non-destructive testing of drilled caissons

1. Description: This Work consists of furnishing testing services and equipment for conducting Crosshole Sonic Logging (CSL) on drilled caissons, providing and installing pipes, grouting of pipes, and all other equipment necessary to conduct sonic testing.

2. General Requirements: Use the nondestructive testing method called Crosshole Sonic Logging on all caissons including demonstration, load test and production caissons.

Employ an experienced independent testing organization that has been approved by the Engineer to conduct the CSL tests. Conduct the testing a minimum of twenty-four hours after the placement of all concrete in the shaft, but no later than seven calendar days after placement.

After the Engineer has accepted the production caissons, remove all water from CSL-access pipes, and then fill these pipes with grout that the Engineer has approved.

3. Pipe installation: Install six pipes in each production caisson to permit access for CSL testing. Use 1.5 to 2 inch (38 mm to 50 mm) inside diameter schedule 40 steel pipes that have round, regular internal diameters free of defects or obstructions including any at pipe joints in order to permit the free, unobstructed passage of a 1.35 inch (33 mm) diameter source and receiver probes. In addition, use pipes that are

watertight and free from corrosion with clean internal and external faces to ensure passage of the probes and a good bond between the concrete and the pipes.

Fit each pipe with a watertight shoe on the bottom and a removable cap on the top. Securely attach the pipes to the interior of the reinforcement cage with a minimum cover of 3 inches (75 mm). The Engineer may allow the pipes to be installed on the outside of the cage if adequate cover and clearance are available. Install the pipes in each caisson in a regular, symmetric pattern such that each pipe is placed the maximum distance possible from each adjacent pipe, with an equal spacing around the perimeter of the cage. Prior to construction, submit the selection of pipe size and type, and the proposed method to install the pipes to the testing organization and to the Engineer. Do not install the pipes until the Engineer has approved the selection and installation method.

Install the pipes as near to parallel as possible. Extend the pipes 6 inches (150 mm) above the caisson bottom and at least 3 feet (900 mm) above the caisson top. If the caisson top is subsurface, extend the pipes at least 2 feet (600 mm) above the ground or water surface. Use watertight joints at any joints that are required to achieve full-length pipes. Replace any pipes that are damaged during installation with new pipes. Fill the pipes with clean water within 4 hours after concrete placement, and cap the pipe tops to keep debris out of the pipes. Do not apply excess torque, hammering, or other stresses during the removal of caps that could break the bond between the pipes and the concrete.

4. Typical CSL test equipment: Typical CSL test equipment consists of the following components:

a. A microprocessor-based CSL system for display of individual CSL records, analog-digital conversion and recording of CSL data, analysis of receiver responses and printing of CSL logs.

b. Ultrasonic source and receiver probes for 1.5 or 2 inch (38 mm or 50 mm) I.D. pipe, as appropriate.

c. An ultrasonic voltage pulser to excite the source with a synchronized triggering system to start the recording system.

d. A depth measurement device to determine and record depths.

e. Appropriate filter/amplification and cable systems for CSL testing.

5. CSL logging procedures: Before the placement of concrete, plumb one pipe per shaft and record the pipe length, including a notation of the stickup of the pipe above the caisson tips. Provide the information on the caisson bottom and top elevations and/or length, along with construction dates to the Engineer and the testing organization before the CSL tests. Conduct the CSL tests between pairs of pipes. Allow the approved testing organization to determine which pairs of pipes are to be tested. Typically, perimeter and/or major diagonals are tested. Conduct additional testing in the event anomalies are detected at no additional cost to the Department

Conduct the CSL tests with the source and receiver probes in the same horizontal plane unless test results indicate potential defects, in which case the questionable zone may be further evaluated with angled tests (source and receiver vertically offset in the pipes). Perform all CSL measurements at depth intervals of 0.2 feet (60 mm) or less, beginning from the bottom of the pipes to the top of each caisson. Pull the probes simultaneously, starting from the bottom of the pipes, over a depth-measuring device. Removed any slack from the cables prior to pulling, to provide for accurate depth measurements of the CSL records. Report any defects indicated by longer pulse-arrival times and significantly lower amplitude/energy signals to the Engineer, and conduct further tests as required by the Engineer to evaluate the extent of such defects. Additional non-destructive testing methods that may be used to evaluate possible defects include Singlehole Sonic Logging, Gamma-Gamma Nuclear Density Logging, and/or Surface Sonic Echo, and Impulse Response Tests.

6. CSL testing results: Supply five copies of the CSL tests in the form of a written report to the Engineer that includes the CSL logs with the following analysis:

a. Initial pulse arrival time versus depth.

b. Pulse energy/amplitude verses depth.

Provide a CSL log for each pipe pair tested with any defect zones indicated on the logs and discussed in the test report, as appropriate.

7. Evaluation of CSL test results: The Engineer will evaluate the CSL test results and determine whether or not the drilled caisson is acceptable.

If the Engineer determines that the drilled caisson is unacceptable based on the CSL tests, replace or core the caisson to allow further evaluation of the caisson. Perform either option at the direction of the Engineer, at no additional cost to the Department.

8. Core drilling of drilled shaft concrete: Core the tested caissons that are determined to be unacceptable by the CSL tests to determine the quality of the concrete. Obtain core samples from each defective caisson for the full depth of the caisson. Perform this work at no additional cost to the Department, and with no increase in contract time.

Retain an accurate log of cores and store the cores in a crate that is properly marked showing the caisson depth at each interval of core recovery. Transport the cores and five copies of the coring logs to the Engineer. After the Engineer has accepted the production caissons, fill these core holes with grout that the Engineer has approved.

524.8 Measurement

1. **Demonstration caisson:** The demonstration test of procedures will include any material, labor, equipment, etc. required for the assembly and installation of the demonstration drilled caisson. All related work to be paid for under this Specification will be performed under the direction of the Engineer. Include all

costs associated with the installation and removal of the demonstration caisson in the bid price for the demonstration caisson.

2. **Instrumentation:** No separate measurement for payment will be made for providing and installing strain gauges and rod tell-tales, or for work, equipment, tools, and incidentals to monitor the strain gauges or rod tell-tales.

3. **Load Test:** The load test will include any material, labor, equipment, etc. required for the assembly and installation of the non-production load test caisson. All related work to be paid for under this Specification will be performed under the direction of the Engineer. Include all costs associated with the installation, removal, and performance of the initial load test on the non-production caisson in the price bid for the load test. No additional payment will be made for instrumentation, load testing, or providing reports.

4. **Drilled caisson:** The length of accepted caisson foundation is measured in linear meter of caisson in place in the completed work. The length is measured from the final approved bottom elevation to the top of the caisson elevation detailed in the plans.

5. **Crosshole sonic logging:** No separate measurement for payment will be made for performing CSL testing, providing testing services and equipment, providing and installing CSL pipes, grouting the CSL pipes, or any other associated costs that are necessary to conduct sonic testing. Include the cost of this Work in the contract bid price for the drilled caissons.

524.9 Payment

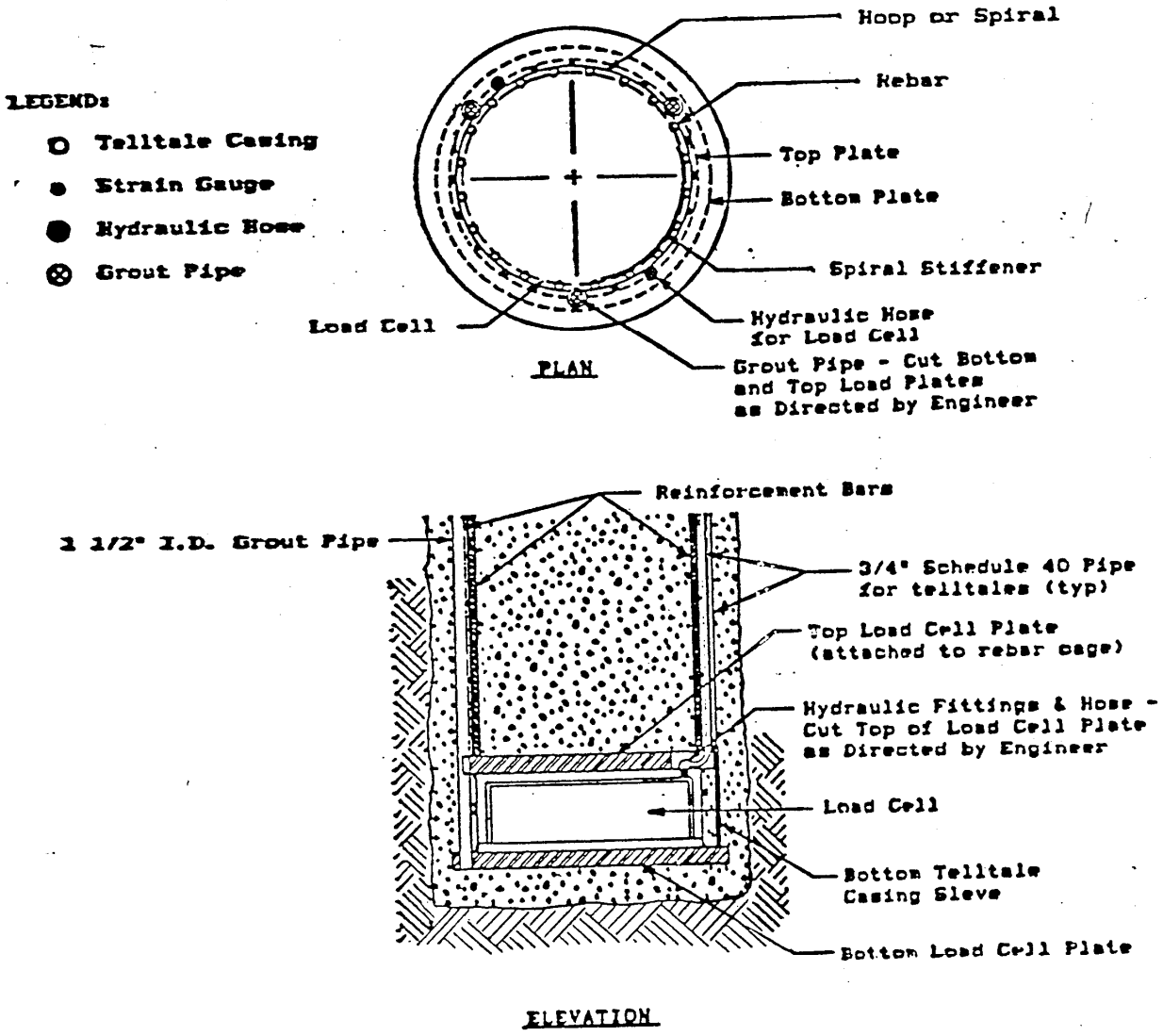
Drilled in place caisson foundations are paid for at the unit price bid per linear foot (meter) complete and in place as specified. The payment is full compensation for all excavation, furnishing and placement of reinforcing steel, slurry, and concrete in the caisson, all temporary and permanent casing, 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. 524-0010 DRILLED CAISSON……..PER LINEAR FOOT (METER)

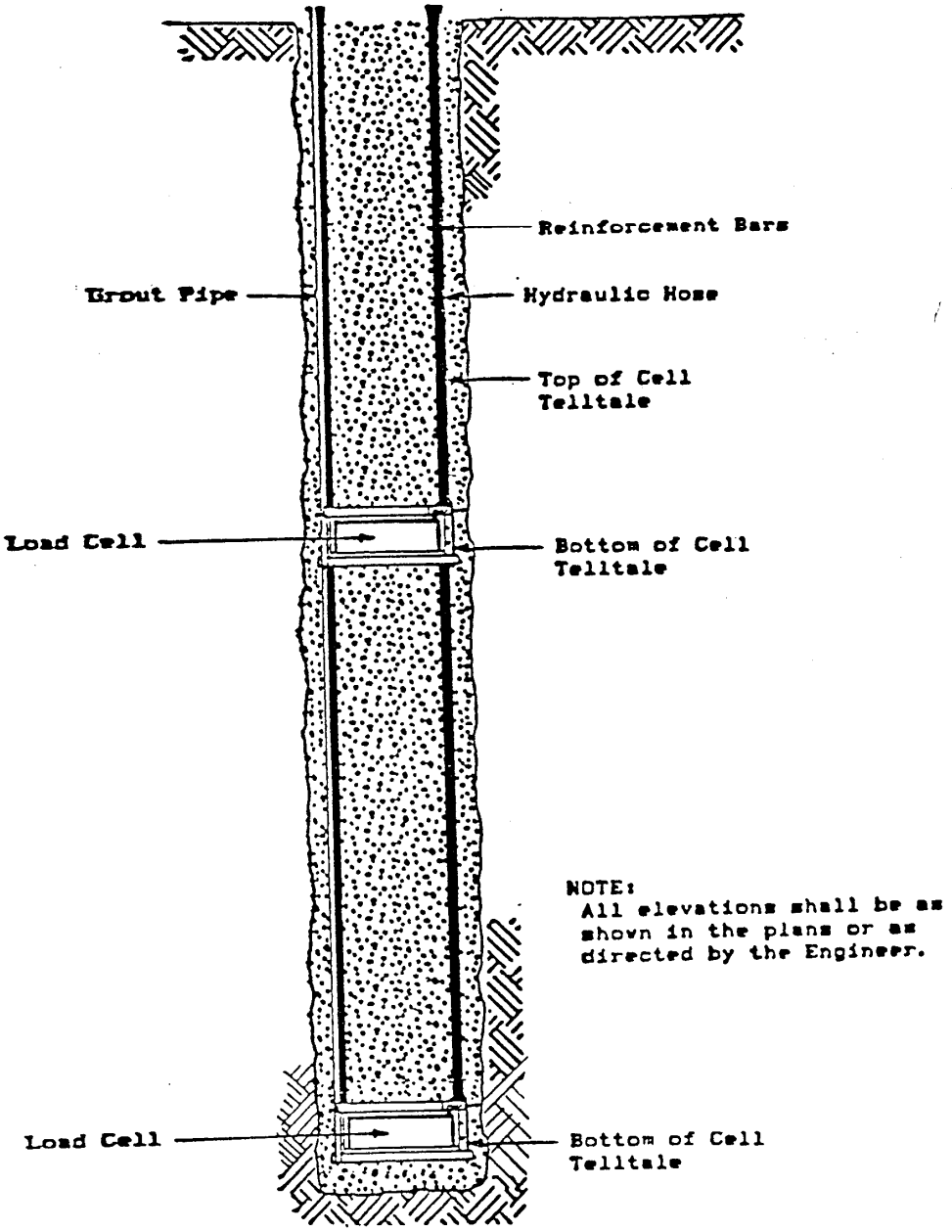
Item No. 524-0300 LOAD TEST CAISSON……..PER EACH

Item No. 524-0500 DEMONSTRATION CAISSON……..PER EACH



SCHEMATIC OF LOADS CELL ASSEMBLY

FIGURE NO. 1

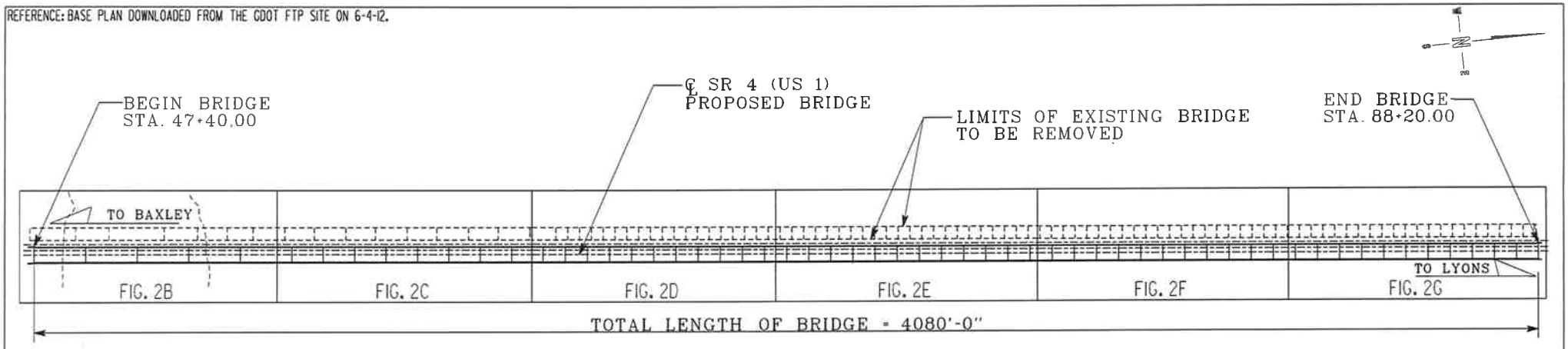


DRILLED CAISSON WITH LOAD CELLS
ABOVE CAISSON TIP

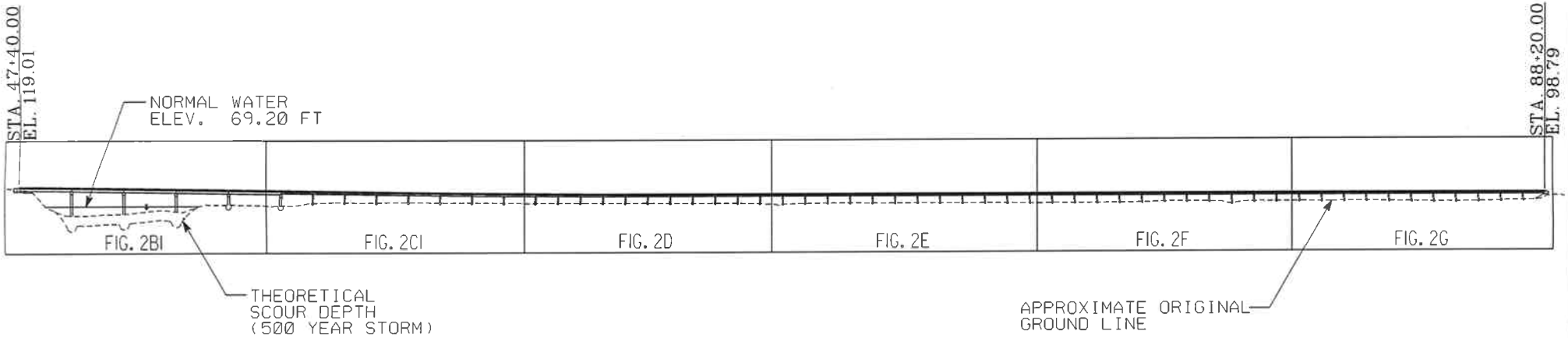
FIGURE NO. 2

SCALE: NTS	DATE: 07/23/2012	PROJECT NO: 2012.3351.01	TITLE: **PROJECT LOCATION MAP** SR 4 (US 1) OVER ALTAMAHA RIVER, BRIDGE 1 BR000-0001-00(216), APPLING/TOOMBS COUNTIES P.I. NO. 0001216	**FIG. 1**
PREPARED: AW	CHECKED:	REVISIONS:		
CLIENT: HEATH & LINEBACK ENGINEERS, INC.			UNITED CONSULTING 625 Holcomb Bridge Road, Norcross, GA 30071 Tel. 770/209-0029 FAX 770/582-2900 www.unitedconsulting.com *We're here for you* UNITED CONSULTING	

REFERENCE: BASE PLAN DOWNLOADED FROM THE GDOT FTP SITE ON 6-4-12.



PLAN



PROFILE

LEGEND			
⊕	BORING LOCATION	----------	TOP OF ALLUVIAL
▽	GROUNDWATER AT TIME OF BORING	----------	TOP OF COASTAL
▼	STABILIZED GROUNDWATER	SP	POORLY-GRADED SAND
℄	BORING CAVED	SM	SILTY SAND
B.T.	BORING TERMINATED	SC	CLAYEY SAND
FILL	FILL SOIL	CL	LEAN CLAY
ALLUVIAL	ALLUVIAL SOIL	CH	FAT CLAY
COASTAL	COASTAL PLAINS SOIL	MH	ELASTIC SILT

SCALE: 1" = 400'	DATE: 8-29-12	PROJECT NO: 2012.3351.01	TITLE: BRIDGE PLAN & PROFILE KEY SR 4 (US 1) OVER ALTAMAHA RIVER - BRIDGE 1 BR000-0001-00(216) APPLING/TOOMBS COUNTIES, GA - P.I. NO. 0001216
PREPARED: VPV	CHECKED:	REVISIONS:	
CLIENT: HEATH & LINEBACK ENGINEERS, INC.			

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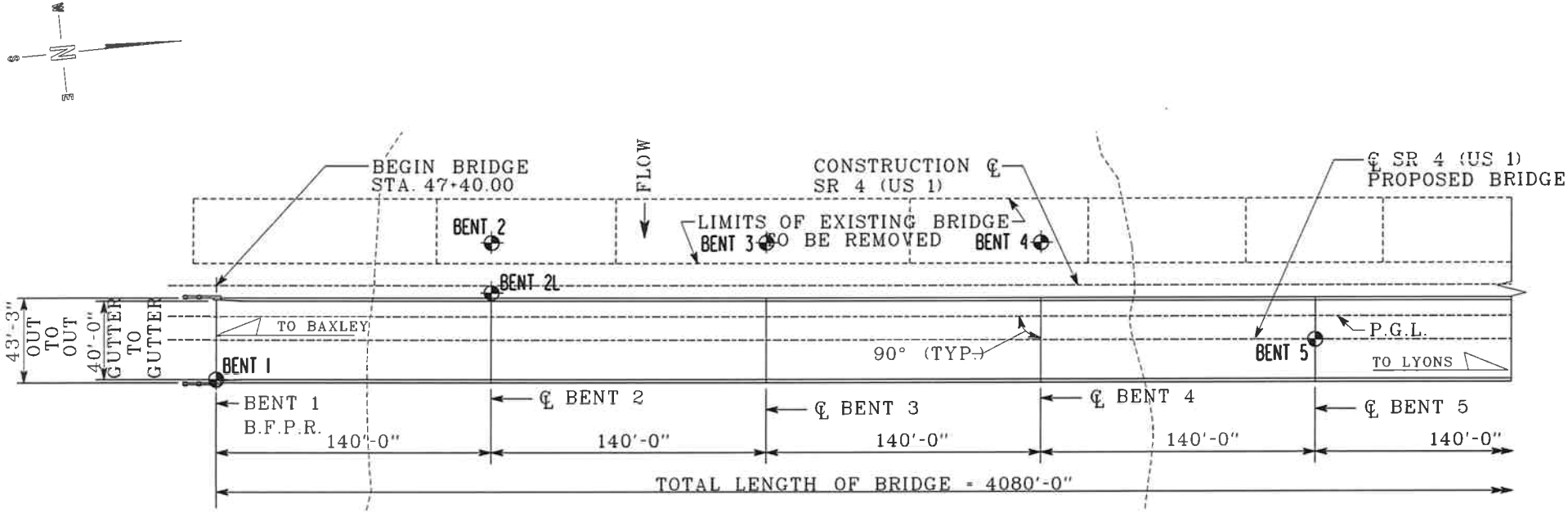
FIG. 2A

V:/DGN/12335101/12335105.DGN

REFERENCE: BASE PLAN DOWNLOADED FROM THE GDOT FTP SITE ON 6-4-12.



PLAN

SCALE: 1" = 80'	DATE: 8-29-12	PROJECT NO: 2012.3351.01	TITLE: BORING LOCATION PLAN SR 4 (US 1) OVER ALTAMAHA RIVER - BRIDGE 1 BR000-0001-00(216) APPLING/TOOMBS COUNTIES, GA - P.I. NO. 0001216
PREPARED: VPV	CHECKED:	REVISIONS: 5-3-13	
CLIENT: HEATH & LINEBACK ENGINEERS, INC.			

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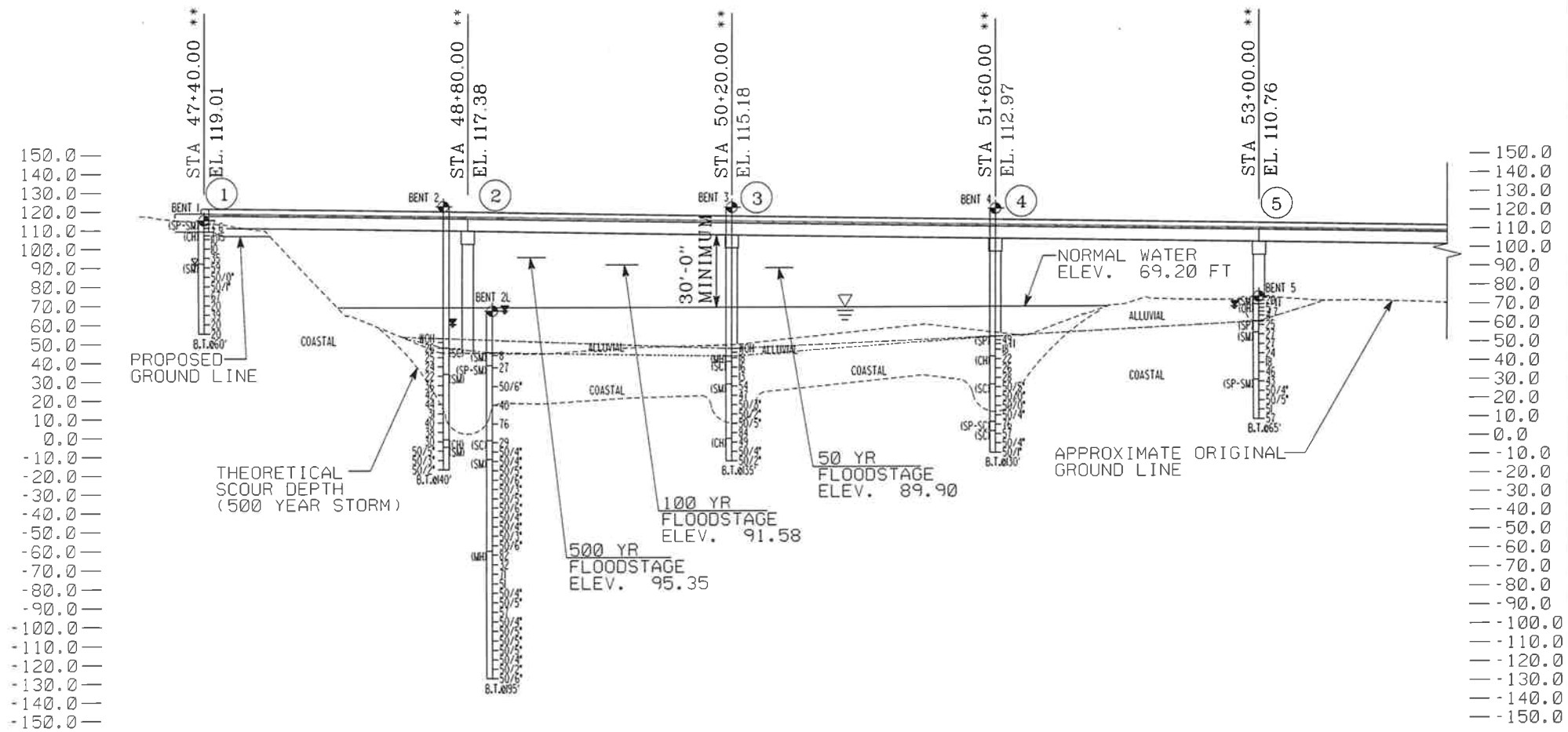
FIG. 2B

V:/DGN/12335101/12335104.DGN

REFERENCE: BASE PLAN DOWNLOADED FROM THE GDOT FTP SITE ON 6-4-12.



PROFILE

SCALE: 1" = 80'	DATE: 8-29-12	PROJECT NO: 2012.3351.01	TITLE: SUBSURFACE PROFILE SR 4 (US 1) OVER ALTAMAHA RIVER - BRIDGE 1 BR000-0001-00(216) APPLING/TOOMBS COUNTIES, GA - P.I. NO. 0001216
PREPARED: VPV	CHECKED:	REVISIONS: 5-3-13	
CLIENT: HEATH & LINEBACK ENGINEERS, INC.			

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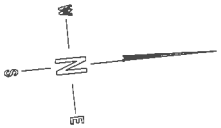
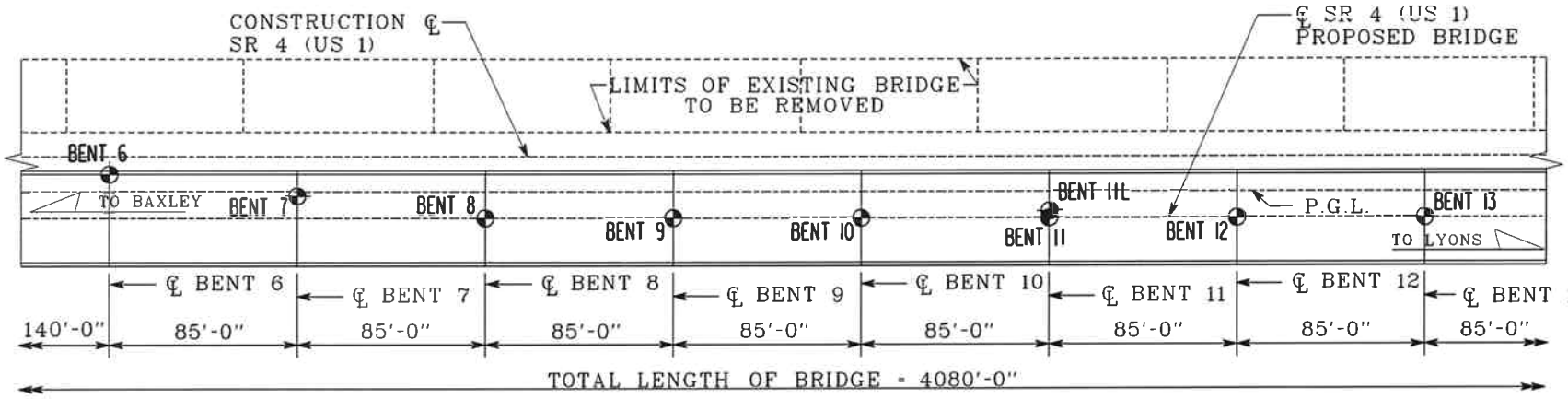
FIG. 2B1

V:/DGN/12335101/12335104.DGN

REFERENCE: BASE PLAN DOWNLOADED FROM THE CDOT FTP SITE ON 6-4-12.





PLAN

SCALE: 1" = 80'	DATE: 8-29-12	PROJECT NO: 2012.3351.01	TITLE: BORING LOCATION PLAN SR 4 (US 1) OVER ALTAMAHA RIVER - BRIDGE 1 BR000-0001-00(216) APPLING/TOOMBS COUNTIES, GA - P.I. NO. 0001216
PREPARED: VPV	CHECKED:	REVISIONS: 5-3-13	
CLIENT: HEATH & LINEBACK ENGINEERS, INC.			

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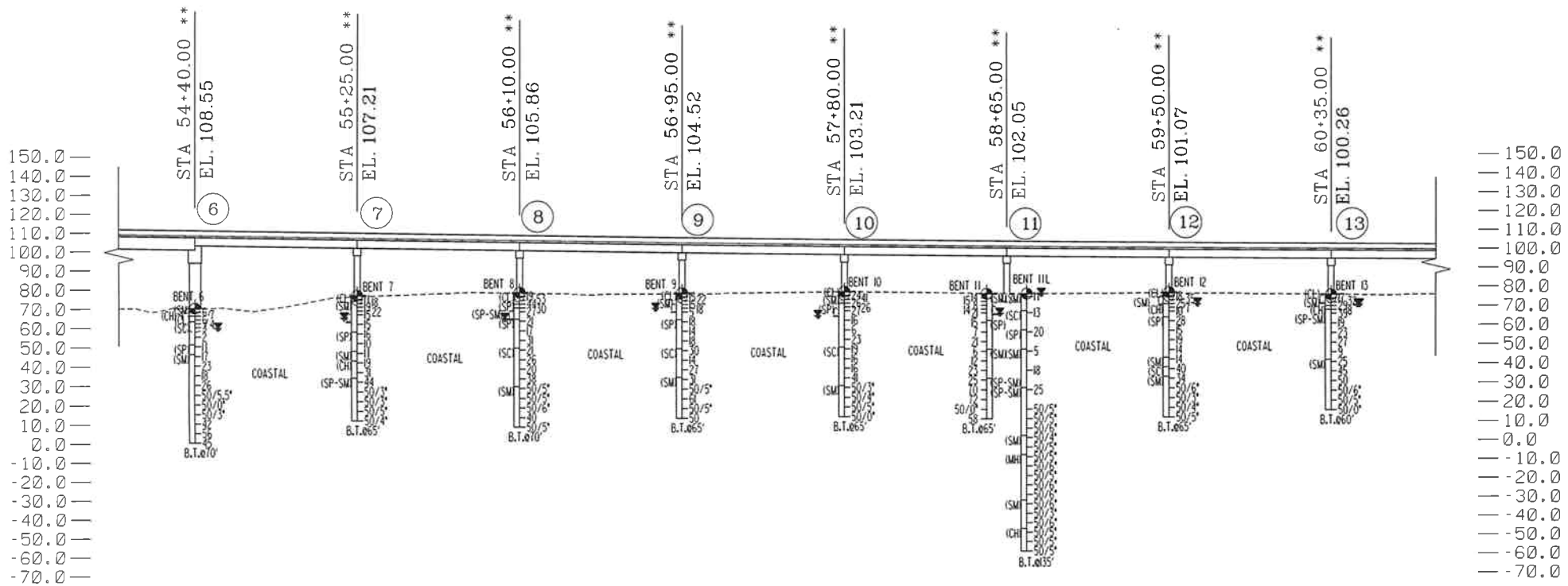
FIG. 2C

V:/DGN/12335101/12335104.DGN

REFERENCE: BASE PLAN DOWNLOADED FROM THE CDOT FTP SITE ON 6-4-12.



PROFILE

SCALE: 1" = 80'	DATE: 8-29-12	PROJECT NO: 2012.3351.01	TITLE: SUBSURFACE PROFILE SR 4 (US 1) OVER ALTAMAHA RIVER - BRIDGE 1 BR000-0001-00(216) APPLING/TOOMBS COUNTIES, GA - P.I. NO. 0001216
PREPARED: VPV	CHECKED:	REVISIONS: 5-3-13	
CLIENT: HEATH & LINEBACK ENGINEERS, INC.			

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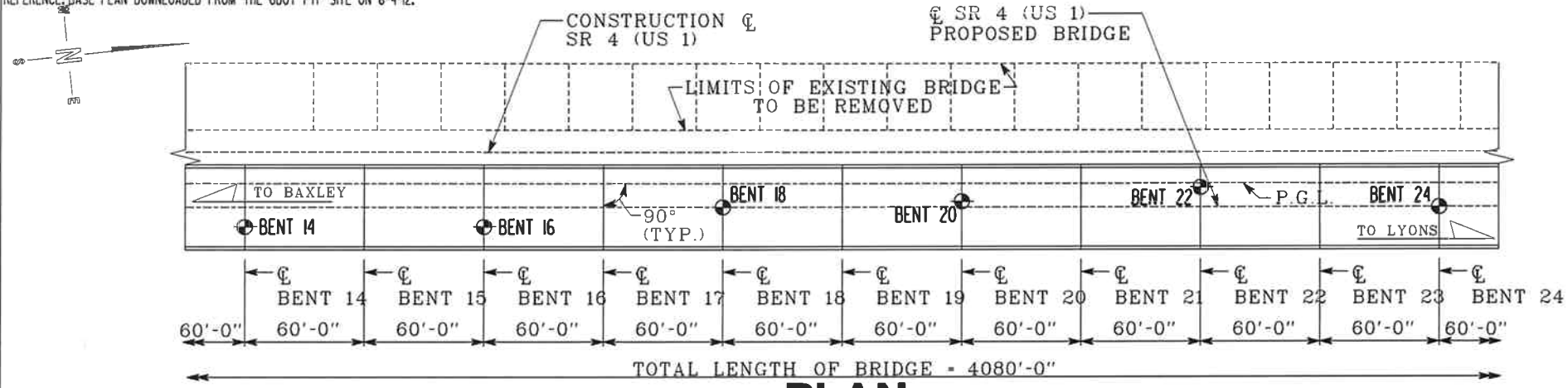
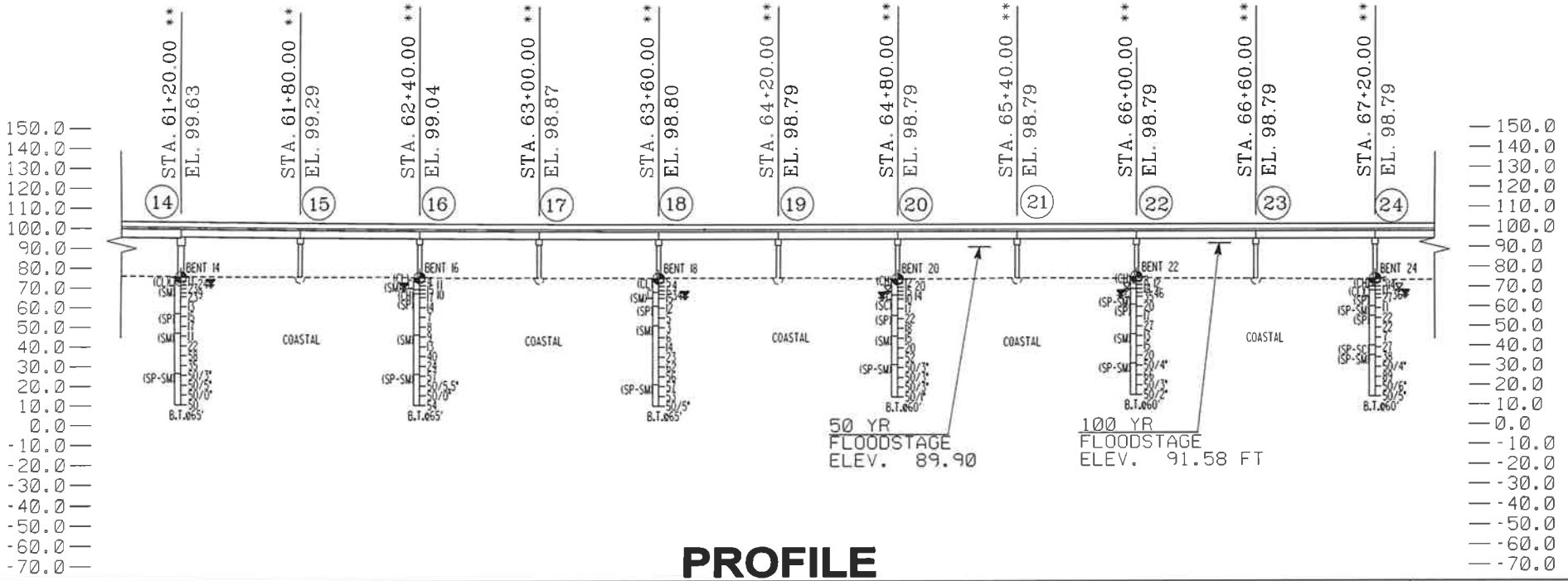
FIG. 2C1

V:/DGN/12335101/12335104.DGN

REFERENCE: BASE PLAN DOWNLOADED FROM THE GDOT FTP SITE ON 6-4-12.



PLAN



PROFILE

SCALE: 1" = 80'	DATE: 8-29-12	PROJECT NO: 2012.3351.01	TITLE: SUBSURFACE PLAN & PROFILE SR 4 (US 1) OVER ALTAMAHA RIVER - BRIDGE 1 BR000-0001-00(216) APPLING/TOOMBS COUNTIES, GA - P.I. NO. 0001216
PREPARED: VPV	CHECKED:	REVISIONS:	
CLIENT: HEATH & LINEBACK ENGINEERS, INC.			

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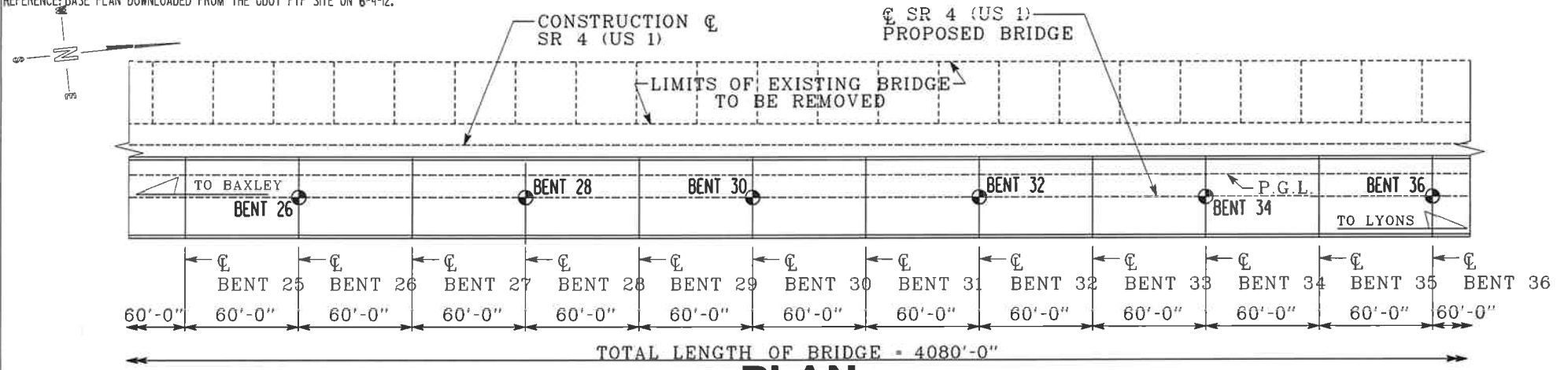
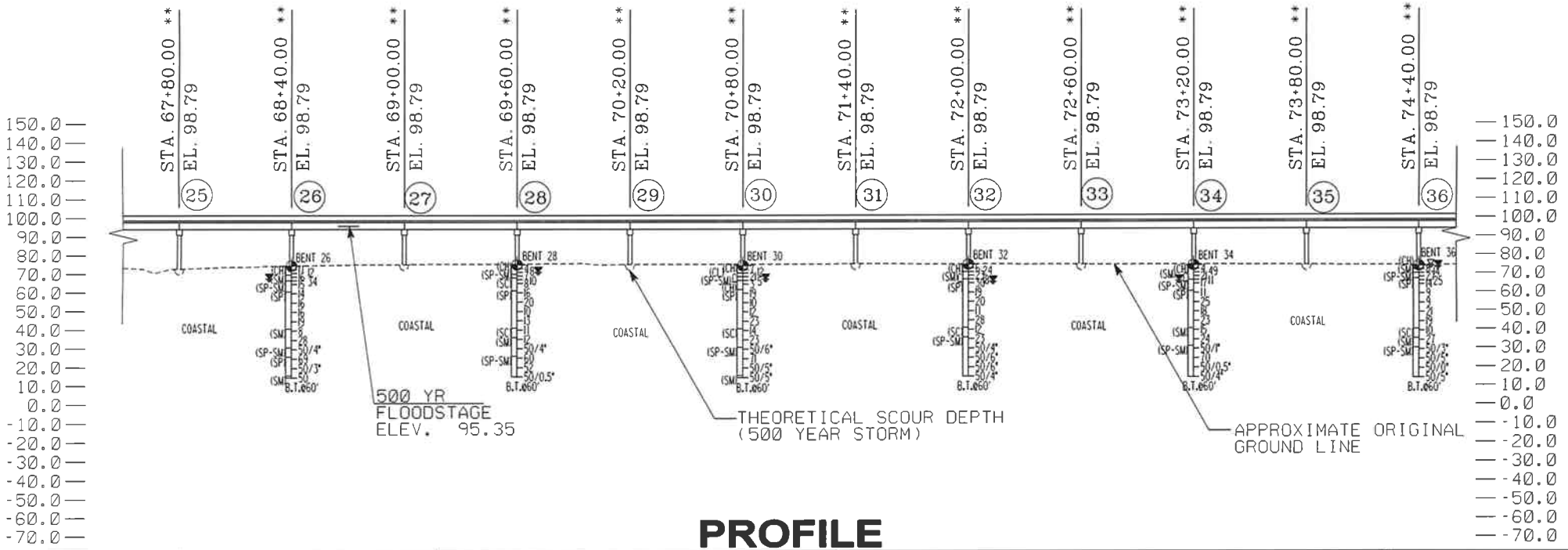
FIG. 2D

V:/DGN/12335101/12335104.DGN

REFERENCE: BASE PLAN DOWNLOADED FROM THE CDOT FTP SITE ON 6-4-12.



PLAN



PROFILE

SCALE: 1" = 80'	DATE: 8-29-12	PROJECT NO: 2012.3351.01	TITLE: SUBSURFACE PLAN & PROFILE SR 4 (US 1) OVER ALTAMAHA RIVER - BRIDGE 1 BR000-0001-00(216) APPLING/TOOMBS COUNTIES, GA - P.I. NO. 0001216
PREPARED: VPV	CHECKED:	REVISIONS:	
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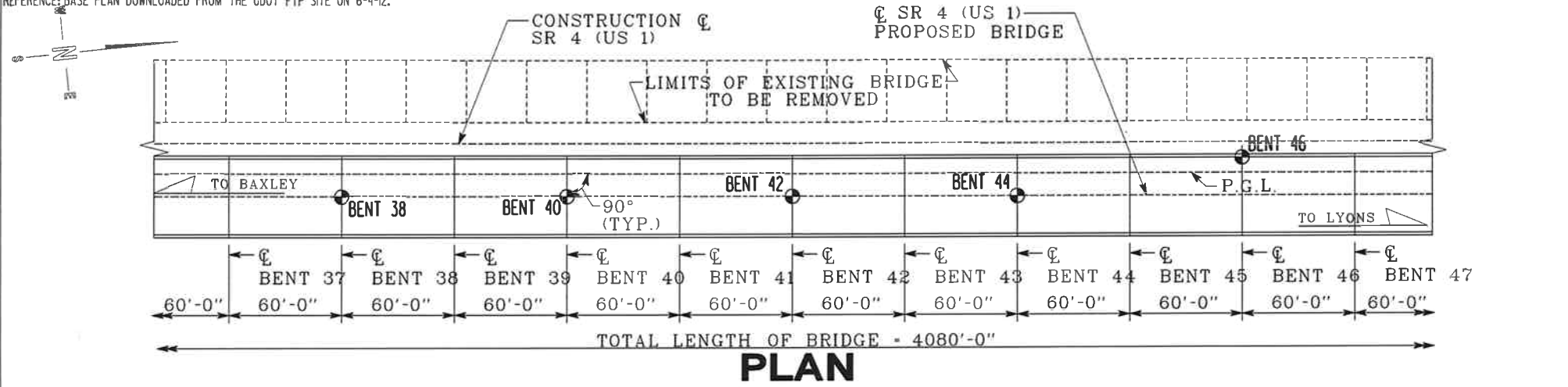
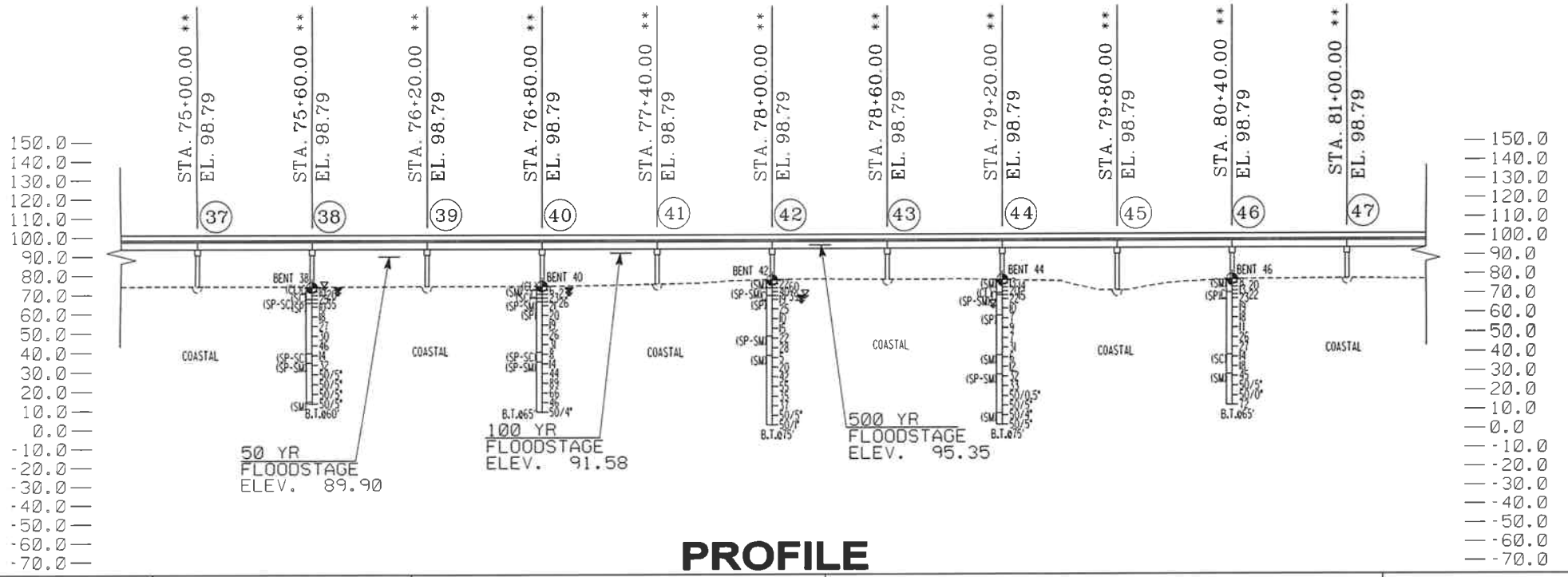
FIG. 2E

V:/DGN/12335101/12335104.DGN

REFERENCE: BASE PLAN DOWNLOADED FROM THE GDOT FTP SITE ON 6-4-12.



PLAN



PROFILE

SCALE: 1" = 80'	DATE: 8-29-12	PROJECT NO: 2012.3351.01	TITLE: SUBSURFACE PLAN & PROFILE SR 4 (US 1) OVER ALTAMAHA RIVER - BRIDGE 1 BR000-0001-00(216) APPLING/TOOMBS COUNTIES, GA - P.I. NO. 0001216
PREPARED: VPV	CHECKED:	REVISIONS:	
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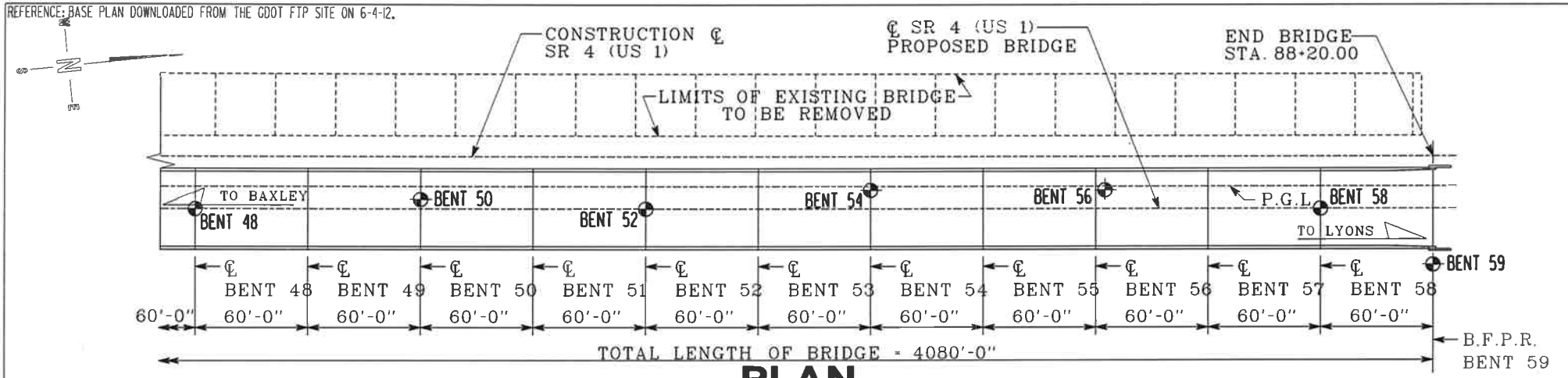
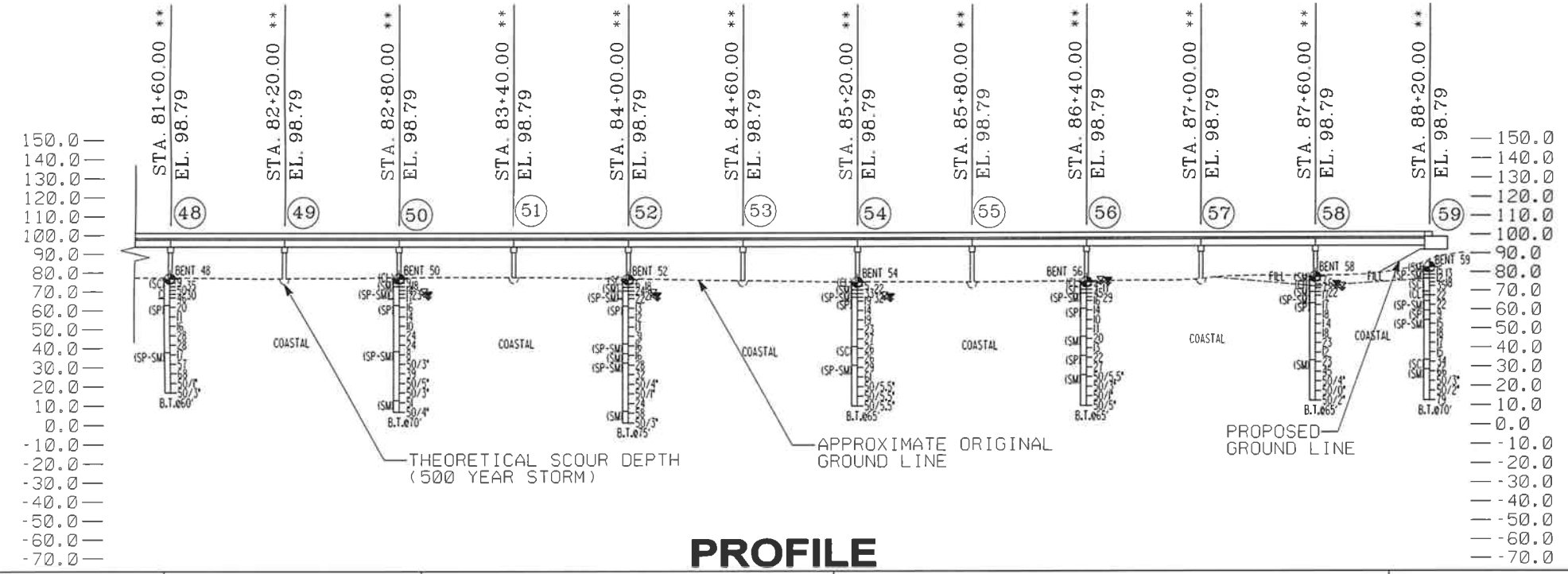
FIG. 2F

V:/DGN/12335101/12335104.DGN

REFERENCE: BASE PLAN DOWNLOADED FROM THE GDOT FTP SITE ON 6-4-12.



PLAN



PROFILE

SCALE: 1" = 80'	DATE: 8-29-12	PROJECT NO: 2012.3351.01	TITLE: SUBSURFACE PLAN & PROFILE SR 4 (US 1) OVER ALTAMAHA RIVER - BRIDGE 1 BR000-0001-00(216) APPLING/TOOMBS COUNTIES, GA - P.I. NO. 0001216
PREPARED: VPV	CHECKED:	REVISIONS:	
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FIG. 2G

V:/DGN/12335101/12335104.DGN

APPENDIX

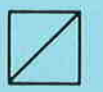
General Notes/Description of Drilling Operations
Logs of Borings (39)
Summary of USCS Tests (21 Pages)
Field Exploration Procedures
Laboratory Testing Procedures
Site Photographs (6 Pages)
Pile Bearing Analysis Results using Driven 1.1 – Bents 1, 7, 20, 30, 52 and 59

GENERAL NOTES

The soil classifications noted on the Boring Logs are visual classifications unless otherwise noted. Minor constituents of a soil sample are termed as follows:

Trace	0 - 10%
Some	11 - 35%
Suffix "y" or "ey"	36 - 49%

LEGEND



Split Spoon Sample obtained during Standard Penetration Testing

Relatively Undisturbed Shelby Tube Sample

Groundwater Level at Time of Boring Completion

Groundwater Level at 24 hours (or as noted) after Termination of Boring

w	Natural Moisture Content	
LL	Liquid Limit	
PL	Plastic Limit	Atterberg Limits
PI	Plasticity Index	
PF	Percent Fines (Percent Passing #200 Sieve)	
γ_d	Dry Unit Weight (Pounds per Cubic Foot or PCF	
γ_m	Moist or In-Situ Unit Weight (PCF)	
γ_{sat}	Saturated Unit Weight (PCF)	

BORING LOG DATA AND NARRATIVE OF DRILLING OPERATIONS

The test borings were made by mechanically advancing helical hollow stem augers into the ground. Samples were covered at regular intervals in each of the borings following established procedures for performing the Standard Penetration Test in accordance with ASTM Specification D-1586. Soil samples were obtained with a standard 1.4" I.D. x 2.0" O.D. split barrel sampler. The sampler is first seated 6" to penetrate any loose cuttings and then driven an additional foot with the blows of a 140 pound hammer freely falling a distance of 30." The number of blows required to drive the sampler each six inches is recorded on the Boring Logs. The total number of blows required to drive the sampler the final foot is designated the "standard penetration resistance." This driving resistance, known as the "N" value, is a measure of the relative density of granular soils and is an indication of the consistency of cohesive deposits.

The following table describes soil consistencies and relative densities based on standard-penetration resistance values (N) determined by the Standard Penetration Test.

	"N"	Consistency
	0-2	Very Soft
	3-4	Soft
	5-8	Firm
Clay and Silt	9-15	Stiff
	16-30	Very Stiff
	Over 31	Hard

	"N"	Relative Density
	0-4	Very Loose
	5-10	Loose
	10-19	Firm
Sand	20-29	Medium Dense
	30-49	Dense
	50+	Very Dense

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BORING LOG

CONTRACTED WITH: HEATH & LINEBACK ENGINEERS, INC.
PROJECT NAME: SR 4 (US 1) OVER ALTAMAHA RIVER, BRIDGE 1
JOB NO.: 2012.3351.01 DRILLER: Josh RIG: CME-45

BORING NO.: BENT 1
DATE: 06/29/2012
LOGGED BY: SRF

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	RECOV.	W	NOTES
	0.5" Topsoil/Grass	0						Station 47+40 48' Right
115	Sand-trace silt, clay and root hair; loose; tan (SP-SM) (Coastal)		1		4-3-4-4	5		
			2		5-3-3-3	15		
		5	3		3-3-4-6	6		
110	Clay-sandy, some silt; stiff; orange-gray (CH)		4		9-6-9-8	24		
			5		5-5-5-8	24	19	PPR= 4.0 TSF
		10						
105								
	-some sand; purple-gray		6		4-5-5	18		PPR= 2.5 TSF
		15						
100								
	-hard; gray-brown		7		7-13-22	18		PPR> 4.5 TSF
		20						
95								
	Sand-some silt, trace clay; very dense; tan-gray (SM)	▽						
		25	8		29-30-29	18	12	Groundwater encountered at 23' at time of drilling
90								
		30	9		50/0	0		
85								PPR= Pocket Penetrometer Reading
		35	10		50/1	1		TSF= Tons per Square Foot
80								
		40	11		26-34-33	18		BR000-0001-00(216) P.I.NO. 0001216 APPLING/TOOMBS COUNTIES
75								

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BORING LOG

CONTRACTED WITH: HEATH & LINEBACK ENGINEERS, INC. BORING NO.: BENT 1
PROJECT NAME: SR 4 (US 1) OVER ALTAMAHA RIVER, BRIDGE 1 DATE: 06/29/2012
JOB NO.: 2012.3351.01 DRILLER: Josh RIG: CME-45 LOGGED BY: SRF

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	RECOV.	W	NOTES
	-medium dense	45	12		9-9-11	18		
70	-dense	50	13		16-13-26	18		
65	-medium dense	55	14		15-9-11	18		
60		60	15		5-6-14	18		
55	BORING TERMINATED AT 60'	65						
50		70						
45		75						
40		80						
35								BR000-0001-00(216) P.I.NO. 0001216 APPLING/TOOMBS COUNTIES

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BORING LOG

CONTRACTED WITH: HEATH & LINEBACK ENGINEERS, INC.
PROJECT NAME: SR 4 (US 1) OVER ALTAMAHA RIVER, BRIDGE 1
JOB NO.: 2012.3351.01 DRILLER: Josh RIG: CME-45

BORING NO.: BENT 2
DATE: 06/28/2012
LOGGED BY: SRF

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	RECOV.	W	NOTES
	10" Concrete							Station 48+80 22' Left
	Open space between bottom of bridge deck and Altamaha River							
120								
		5						
115								
		10						
110								
		15						
105								
		20						
100								
		25						
95								
		30						
90								
		35						
85								
		40						
								BR000-0001-00(216) P.I.NO. 0001216 APPLING/TOOMBS COUNTIES

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BORING LOG

CONTRACTED WITH: HEATH & LINEBACK ENGINEERS, INC. BORING NO.: BENT 2
PROJECT NAME: SR 4 (US 1) OVER ALTAMAHA RIVER, BRIDGE 1 DATE: 06/28/2012
JOB NO.: 2012.3351.01 DRILLER: Josh RIG: CME-45 LOGGED BY: SRF

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	RECOV.	W	NOTES
80								
		45						
75								
		50						
70								
		55						
65								
		60						
	Altamaha River							Water at Elevation 62.5' at time of drilling
60								
		65						
55								
	Bottom of River	70						
	(Alluvial)		1		WOH	0		WOH= Weigh of Hammer
50								
		75						
	Sand-some silt, trace clay; medium dense; tan (SC) (Coastal)		2		15-11-15-16	24	48	
45			3		16-10-15-10	6		
		80						
								BR000-0001-00(216) P.I.NO. 0001216 APPLING/TOOMBS COUNTIES
40								

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BORING LOG

CONTRACTED WITH: HEATH & LINEBACK ENGINEERS, INC. BORING NO.: BENT 2
PROJECT NAME: SR 4 (US 1) OVER ALTAMAHA RIVER, BRIDGE 1 DATE: 06/28/2012
JOB NO.: 2012.3351.01 DRILLER: Josh RIG: CME-45 LOGGED BY: SRF

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	RECOV.	W	NOTES
	-some clay; light gray	85	4		10-10-14	18		
35	-trace clay (SM)	90	5		8-10-12	18		
30	dense	95	6		16-17-19	18		
25		100	7		15-17-25	18		
20		105	8		19-21-23	18		
15		110	9		10-11-20	18	35	
10		115	10		13-17-23	18		
500 Year Scour 5		120	11		22-20-18	18		
0	Clay-sandy, some silt; very stiff; tan (CH)	125	12		10-14-16	18	53	BR000-0001-00(216) P.I.NO. 0001216 APPLING/TOOMBS COUNTIES

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BORING LOG

CONTRACTED WITH: HEATH & LINEBACK ENGINEERS, INC. BORING NO.: BENT 2
PROJECT NAME: SR 4 (US 1) OVER ALTAMAHA RIVER, BRIDGE 1 DATE: 06/28/2012
JOB NO.: 2012.3351.01 DRILLER: Josh RIG: CME-45 LOGGED BY: SRF

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	RECOV.	W	NOTES
-5	Sand-trace silt and clay; very dense; gray (SM)	130	13		50/5	5		
-10		135	14		50/3	3		
-15		140	15		50/2	2		
	BORING TERMINATED AT 140'							
-20		145						
-25		150						
-30		155						
-35		160						
-40		165						BR000-0001-00(216) P.I.NO. 0001216 APPLING/TOOMBS COUNTIES

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BORING LOG

CONTRACTED WITH: HEATH & LINEBACK ENGINEERS, INC.
PROJECT NAME: SR 4 (US 1) OVER ALTAMAHA RIVER, BRIDGE 1
JOB NO.: 2012.3351.02 DRILLER: ADAM RIG: D-50

BORING NO.: BENT 2 L
DATE: 04/27-04/28/2013
LOGGED BY: AW

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	RECOV.	W	NOTES
	WATER	0						Station 48+80, 3' Right
	Altamaha River							
65		5						
60		10						
55		15						
50		20						
	Bottom of River							
45	Sand-silty, trace clay; loose; gray (SM) (Coastal)	25	1		3-3-5	18		
40	-some silt; medium dense; tan (SP-SM)	30	2		12-13-14	18		
35		35						
30	-very dense; light gray	40	3		22-33-50/6	12		BR000-0001-00(216) P.I.NO. 0001216 APPLING/TOOMBS COUNTIES

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BORING LOG

CONTRACTED WITH: HEATH & LINEBACK ENGINEERS, INC. BORING NO.: BENT 2 L
PROJECT NAME: SR 4 (US 1) OVER ALTAMAHA RIVER, BRIDGE 1 DATE: 04/27-04/28/2013
JOB NO.: 2012.3351.02 DRILLER: ADAM RIG: D-50 (BARGE) LOGGED BY: AW

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	RECOV.	W	NOTES
25								
		45						
20	-dense	50	4		14-21-19	18		
15		55						
10	-very dense	60	5		19-30-46	18		
500 Year Scour 5		65						
0	-some clay; medium dense (SC)	70	6		7-11-18	18		
-5	-very dense; greenish gray	75	7		50/4	4		
-10	-some rock fragments (SM)	80	8		50/4	4		BR000-0001-00(216) P.I.NO. 0001216 APPLING/TOOMBS COUNTIES
-15								

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BORING LOG

CONTRACTED WITH: HEATH & LINEBACK ENGINEERS, INC. BORING NO.: BENT 2 L
PROJECT NAME: SR 4 (US 1) OVER ALTAMAHA RIVER, BRIDGE 1 DATE: 04/27-04/28/2013
JOB NO.: 2012.3351.02 DRILLER: ADAM RIG: D-50 (BARGE) LOGGED BY: AW

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	RECOV.	W	NOTES
		85	9		50/5	5	36.4	
-20		90	10		50/6	6		
-25	-silty, trace clay, no rock fragments; gray	95	11		28-50/3	9		
-30	-some silt, clay and rock fragments	100	12		50/5	3		
-35		105	13		50/6	3		
-40	-silty, trace clay and rock fragments	110	14		29-50/4	10		
-45		115	15		50/4	1		
-50		120	16		38-50/3	9		BR000-0001-00(216) P.I.NO. 0001216 APPLING/TOOMBS COUNTIES
-55	Silt-some clay and sand; hard; greenish gray (MH)		17		37-50/6	12		PPR> 4.5 TSF

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BORING LOG

CONTRACTED WITH: HEATH & LINEBACK ENGINEERS, INC. BORING NO.: BENT 2 L
PROJECT NAME: SR 4 (US 1) OVER ALTAMAHA RIVER, BRIDGE 1 DATE: 04/27-04/28/2013
JOB NO.: 2012.3351.02 DRILLER: ADAM RIG: D-50 (BARGE) LOGGED BY: AW

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	RECOV.	W	NOTES
-60								
		130	18		45-39-43	18		PPR> 4.5 TSF
-65								
		135	19		15-16-16	18		PPR= 4.0 TSF
-70								
		140	20		22-40-31	18		PPR= 3.5 TSF
-75								
		145	21		19-22-29	18		PPR> 4.5 TSF
-80								
		150	22		37-50/4	10	44.3	PPR> 4.5 TSF
-85								
		155	23		50/5	5		PPR> 4.5 TSF
-90								
		160	24		19-24-33	18		PPR> 4.5 TSF BR000-0001-00(216) P.I.NO. 0001216 APPLING/TOOMBS COUNTIES
-95								
	-sandy	165	25		33-50/4	10		PPR> 4.5 TSF

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PROJECT NAME: SR 4 (US 1) OVER ALTAMAHA RIVER, BRIDGE 1 DATE: 04/27-04/28/2013
JOB NO.: 2012.3351.02 DRILLER: ADAM RIG: D-50 (BARGE) LOGGED BY: AW

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	RECOV.	W	NOTES
-100								
		170	26		24-50/5	11		PPR> 4.5 TSF
-105								
	-some sand	175	27		30-50/5	11		PPR> 4.5 TSF
-110								
	-sandy	180	28		22-50/5	11	46.9	PPR> 4.5 TSF
-115								
		185	29		50/4	4		PPR> 4.5 TSF
-120								
		190	30		50/2	0		No recovery
-125								
		195	31		50/6	0		No recovery
	BORING TERMINATED AT 195'							
-130								
		200						PPR=Pocket Penetrometer Reading TSF=Tons per Square Foot
-135								
		205						BR000-0001-00(216) P.I.NO. 0001216 APPLING/TOOMBS COUNTIES
-140								

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BORING LOG

CONTRACTED WITH: HEATH & LINEBACK ENGINEERS, INC.
PROJECT NAME: SR 4 (US 1) OVER ALTAMAHA RIVER, BRIDGE 1
JOB NO.: 2012.3351.01 DRILLER: Josh RIG: CME-45

BORING NO.: BENT 3
DATE: 06/27/2012
LOGGED BY: SRF

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	SAMPLES TYPE	SAMPLES BLOWS/6"	SAMPLES RECOV.	SAMPLES W	NOTES
	10" Concrete							Station 50+20 22' Left
	Open space between bottom of bridge deck and Altamaha River							
120								
		5						
115								
		10						
110								
		15						
105								
		20						
100								
		25						
95								
		30						
90								
		35						
85								
		40						
								BR000-0001-00(216) P.I.NO. 0001216 APPLING/TOOMBS COUNTIES

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BORING LOG

CONTRACTED WITH: HEATH & LINEBACK ENGINEERS, INC. BORING NO.: BENT 3
PROJECT NAME: SR 4 (US 1) OVER ALTAMAHA RIVER, BRIDGE 1 DATE: 06/27/2012
JOB NO.: 2012.3351.01 DRILLER: Josh RIG: CME-45 LOGGED BY: SRF

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	RECOV.	W	NOTES
80								
		45						
75								
		50						
70								
		55						
65								
		60						
	Altamaha River							Water at elevation 62.5' at time of drilling
60								
		65						
55								
		70						
50								
	Bottom of River	75						
	(Alluvial)		1		WOH	0		WOH= Weigh of Hammer
45								
		80						
	Silt-clayey, some sand; very stiff; gray white (MH) (Coastal)		2		7-8-10-9	24	100	BR000-0001-00(216) P.I.NO. 0001216 APPLING/TOOMBS COUNTIES
40	Sand-some clay and silt; firm; tan (SC)		3		8-9-7-9	24		

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BORING LOG

CONTRACTED WITH: HEATH & LINEBACK ENGINEERS, INC. BORING NO.: BENT 3
PROJECT NAME: SR 4 (US 1) OVER ALTAMAHA RIVER, BRIDGE 1 DATE: 06/27/2012
JOB NO.: 2012.3351.01 DRILLER: Josh RIG: CME-45 LOGGED BY: SRF

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	RECOV.	W	NOTES
35		85						
		90	4		6-6-7	18		
30	-trace silt and clay; very dense (SM)	95	5		22-26-28	18		
25	-dense	100	6		15-20-27	18		
20	-very dense	105	7		15-37-50/3	15	32	
15		110	8		50/2	0		
10		115	9		11-50/5	5		
500 Year Scour								
5		120	10		26-39-45	18		
0	Clay-sandy, some silt; hard; light gray (CH)	125	11		11-24-25	18	58	BR000-0001-00(216) P.I.NO. 0001216 APPLING/TOOMBS COUNTIES

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BORING LOG

CONTRACTED WITH: HEATH & LINEBACK ENGINEERS, INC. BORING NO.: BENT 3
PROJECT NAME: SR 4 (US 1) OVER ALTAMAHA RIVER, BRIDGE 1 DATE: 06/27/2012
JOB NO.: 2012.3351.01 DRILLER: Josh RIG: CME-45 LOGGED BY: SRF

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	RECOV.	W	NOTES
-5								
		130	12		50/4	4		
-10								
		135	13		50/2	2		
	BORING TERMINATED AT 135'							
-15								
		140						
-20								
		145						
-25								
		150						
-30								
		155						
-35								
		160						
-40								
		165						BR000-0001-00(216) P.I.NO. 0001216 APPLING/TOOMBS COUNTIES
-45								

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BORING LOG

CONTRACTED WITH: HEATH & LINEBACK ENGINEERS, INC.
PROJECT NAME: SR 4 (US 1) OVER ALTAMAHA RIVER, BRIDGE 1
JOB NO.: 2012.3351.01 DRILLER: Will/Josh RIG: CME-45

BORING NO.: BENT 4
DATE: 06/27/2012
LOGGED BY: AW/SRF

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	SAMPLES TYPE	SAMPLES BLOWS/6"	SAMPLES RECOV.	SAMPLES W	NOTES
	10" Concrete							Station 51+60 22' Left
120	Open space between bottom of bridge deck and Altamaha River							
		5						
115								
		10						
110								
		15						
105								
		20						
100								
		25						
95								
		30						
90								
		35						
85								
		40						
80								BR000-0001-00(216) P.I.NO. 0001216 APPLING/TOOMBS COUNTIES

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BORING LOG

CONTRACTED WITH: HEATH & LINEBACK ENGINEERS, INC. BORING NO.: BENT 4
PROJECT NAME: SR 4 (US 1) OVER ALTAMAHA RIVER, BRIDGE 1 DATE: 06/27/2012
JOB NO.: 2012.3351.01 DRILLER: Will/Josh RIG: CME-45 LOGGED BY: AW/SRF

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	RECOV.	W	NOTES
75		45						
70		50						
65		55						
60		60						
	Altamaha River							Water at elevation 61' at time of drilling
55		65						
	Bottom of River							
	Sand-trace silt; dense; gray (SP) (Coastal)		1		16-24-25-7	10		
	-firm	70	2		5-6-5-8	10		
50			3		8-10-8-8	24		
		75						
45								
	Clay-sandy; some silt; very stiff; greenish gray (CH)		4		6-10-12	18	65	PPR= 1.5 TSF
		80						BR000-0001-00(216) P.I.NO. 0001216 APPLING/TOOMBS COUNTIES
40								

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BORING LOG

CONTRACTED WITH: HEATH & LINEBACK ENGINEERS, INC. BORING NO.: BENT 4
PROJECT NAME: SR 4 (US 1) OVER ALTAMAHA RIVER, BRIDGE 1 DATE: 06/27/2012
JOB NO.: 2012.3351.01 DRILLER: Will/Josh RIG: CME-45 LOGGED BY: AW/SRF

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	RECOV.	W	NOTES
		85	5		6-10-16	18		PPR= 3.25 TSF
35								
		90	6		7-11-17	18		PPR= 2.25 TSF
30								
	Sand-clayey; trace silt; very dense; greenish gray (SC)	95	7		15-35-50/5	10		
25								
		100	8		50/0	0		Difficult drilling from 98.5 to 108 feet
20								
		105	9		50/0	0		
15								
500 Year Scour	-some clay and silt	110	10		15-50/4	10		
10								
	-trace clay and silt (SP-SC)	115	10		34-35-41	18	26	PPR= Pocket Penetrometer Reading TSF= Tons per Square Foot
5								
	-clayey; tan (SC)	120	11		15-20-37	18		
0								
		125	12		50/4	4		BR000-0001-00(216) P.I.NO. 0001216 APPLING/TOOMBS COUNTIES

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BORING LOG

CONTRACTED WITH: HEATH & LINEBACK ENGINEERS, INC. BORING NO.: BENT 4
PROJECT NAME: SR 4 (US 1) OVER ALTAMAHA RIVER, BRIDGE 1 DATE: 06/27/2012
JOB NO.: 2012.3351.01 DRILLER: Will/Josh RIG: CME-45 LOGGED BY: AW/SRF

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	RECOV.	W	NOTES
-5								
		130	13		50/1	0		
	BORING TERMINATED AT 130'							
-10								
		135						
-15								
		140						
-20								
		145						
-25								
		150						
-30								
		155						
-35								
		160						
-40								
		165						BR000-0001-00(216) P.I.NO. 0001216 APPLING/TOOMBS COUNTIES
-45								

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BORING LOG

CONTRACTED WITH: HEATH & LINEBACK ENGINEERS, INC.
PROJECT NAME: SR 4 (US 1) OVER ALTAMAHA RIVER, BRIDGE 1
JOB NO.: 2012.3351.01 DRILLER: Josh RIG: CME-45

BORING NO.: BENT 5
DATE: 06/31/2012
LOGGED BY: SRF

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	RECOV.	W	NOTES
75	0.5" Topsoil/Grass	0						Station 53+00 28' Right
	Sand-trace silt and root hair; medium dense; tan (SM) (Alluvial)		1		6-8-12-12	20		
	-some silt; firm; gray		2		8-6-5-5	10		
70	Clay-silty, trace sand and root hair; firm; gray-brown (CH)	▼	3		3-2-3-2	20	38	PPR= 0.25 TSF Groundwater measured at 5' after 24 hours
			4		2-3-4-4	20		PPR= 0.5 TSF
	-soft		5		2-2-2-2	18		PPR= 0.25 TSF
65		10						
	Sand-trace silt; medium dense; gray (Coastal) (SP)		6		9-13-12	18		
500 Year Scour 60		15						
	-some silt and clay; medium dense; tan (SM)		7		14-13-14	18		
55		20						
	-trace clay		8		8-13-14	18		
50		25						
	-silty; some clay; light gray		9		8-8-16	18		
45		30						PPR= Pocket Penetrometer Reading TSF= Tons per Square Foot
	-some silt; trace clay; firm; gray		10		7-6-12	18		
40		35						BR000-0001-00(216) P.I.NO. 0001216 APPLING/TOOMBS COUNTIES
	-dense		11		13-18-28	18		
35		40						

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BORING LOG

CONTRACTED WITH: HEATH & LINEBACK ENGINEERS, INC. BORING NO.: BENT 5
PROJECT NAME: SR 4 (US 1) OVER ALTAMAHA RIVER, BRIDGE 1 DATE: 06/31/2012
JOB NO.: 2012.3351.01 DRILLER: Josh RIG: CME-45 LOGGED BY: SRF

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	RECOV.	W	NOTES
30	-trace silt (SP-SM)	45	12		12-16-27	18	32	
25	-very dense	50	13		24-36-50/4	16		
20		55	14		50/5	5		
15		60	15		14-18-33	18		
10		65	16		15-23-34	18		
	BORING TERMINATED AT 65'							
5		70						
0		75						
-5		80						BR000-0001-00(216) P.I.NO. 0001216 APPLING/TOOMBS COUNTIES

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BORING LOG

CONTRACTED WITH: HEATH & LINEBACK ENGINEERS, INC.
BORING NO.: BENT 6
PROJECT NAME: SR 4 (US 1) OVER ALTAMAHA RIVER, BRIDGE 1
DATE: 06/21/2012
JOB NO.: 2012.3351.01 DRILLER: Josh RIG: CME-45
LOGGED BY: SRF

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	RECOV.	W	NOTES
	1" Topsoil/Grass	0						Station 54+40 8' Right
70	Sand-silty, some clay; loose; tan-gray (SM) (Coastal)		1		4-3-3-4	16		
	Clay-some silt and sand; firm; gray-tan (CH)		2		4-3-4-5	20		PPR= 3.75 TSF
	-sandy (CL)	5	3		2-3-3-5	16		PPR= 2.75 TSF
65			4		2-3-1-2	18		
	Sand-some clay and silt; very loose; gray-tan (SC)							
	-some organic; gray	10	5		2-1-2-2	18		
60		▼						Groundwater measured at 10.5' after 24 hours
	-dark gray		6		1-1-1	18	34	-large root fragment in spoon
500 Year Scour		15						
55								
	-trace silt and clay, no organic; firm; light gray (SP)	20	7		5-5-6	18		
50								
	-silty-some clay; tan (SM)	25	8		7-7-10	18		
45								
	-medium dense	30	9		10-9-14	18		
40								PPR= Pocket Penetrometer Reading TSF= Tons per Square Foot
	-firm; light gray	35	10		5-8-10	18		
35								BR000-0001-00(216) P.I.NO. 0001216 APPLING/TOOMBS COUNTIES
	-medium dense	40	11		8-10-16	18		
30								

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BORING LOG

CONTRACTED WITH: HEATH & LINEBACK ENGINEERS, INC. BORING NO.: BENT 6
PROJECT NAME: SR 4 (US 1) OVER ALTAMAHA RIVER, BRIDGE 1 DATE: 06/21/2012
JOB NO.: 2012.3351.01 DRILLER: Josh RIG: CME-45 LOGGED BY: SRF

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	RECOV.	W	NOTES
	-some silt; trace clay; very dense	45	12		50/5.5	5		
25		50	13		50/0	0		
20		55	14		16-50/3	8		
15	-dense	60	15		10-17-25	18	34	
10	-very dense	65	16		17-20-36	18		
5	-dense	70	17		17-20-25	18		
0	BORING TERMINATED AT 70'							
-5		75						
-10		80						BR000-0001-00(216) P.I.NO. 0001216 APPLING/TOOMBS COUNTIES

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BORING LOG

CONTRACTED WITH: HEATH & LINEBACK ENGINEERS, INC. BORING NO.: BENT 7
PROJECT NAME: SR 4 (US 1) OVER ALTAMAHA RIVER, BRIDGE 1 DATE: 06/20/2012
JOB NO.: 2012.3351.01 DRILLER: Josh RIG: CME-45 LOGGED BY: SRF

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	RECOV.	W	NOTES
	No Topsoil	0						Station 55+25 18' Right
	Clay-some silt and sand, trace root hair; stiff; tan gray (Coastal) (CL)		1		4-5-6-10	15		PPR= 2.75 TSF
75			2		11-7-11-12	24		
500 Year Scour	Sand-some silt, trace clay; firm; tan (SM)	5	3		4-6-13-16	20		
	-medium dense		4		15-10-12-15	16		
70	-firm; gray-tan		5		7-7-8-6	20		
		10						
		▼						Groundwater measured at 11.7' after 24 hours, borehole caved- in at 14'
65	-gray	C 15	6		9-8-7	10		-coarse sand
60								
	-trace silt and gravel (SP)	20	7		7-9-7	6		-coarse sand
55								
		25	8		7-6-4	4		-coarse sand
50								
	-silty; some clay; light gray (SM)	30	9		5-4-7	18		
45								PPR= Pocket Penetrometer Reading TSF= Tons per Square Foot
	Clay-sandy, trace silt; very stiff; tan (CH)	35	10		7-7-12	18	90	
40								BR000-0001-00(216) P.I.NO. 0001216 APPLING/TOOMBS COUNTIES
	-some clay and silt; dense	40	11		10-14-17	18		

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BORING LOG

CONTRACTED WITH: HEATH & LINEBACK ENGINEERS, INC. BORING NO.: BENT 7
PROJECT NAME: SR 4 (US 1) OVER ALTAMAHA RIVER, BRIDGE 1 DATE: 06/20/2012
JOB NO.: 2012.3351.01 DRILLER: Josh RIG: CME-45 LOGGED BY: SRF

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	RECOV.	W	NOTES
35								
	Sand-trace silt and clay; dense; tan (SP-SM)	45	12		11-16-28	18		
30								
	-very dense	50	13		26-41-50/3	15	29	
25								
		55	14		21-40-50/3	15		
20								
		60	15		50/5	5		Difficult drilling from 59' to 63'
15								
		65	16		9-13-50/4	16		
	BORING TERMINATED AT 65'							
10								
		70						
5								
		75						
0								
		80						
-5								

BR000-0001-00(216)
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BORING LOG

CONTRACTED WITH: HEATH & LINEBACK ENGINEERS, INC.
PROJECT NAME: SR 4 (US 1) OVER ALTAMAHA RIVER, BRIDGE 1
JOB NO.: 2012.3351.01 DRILLER: LEON RIG: D-50

BORING NO.: BENT 8
DATE: 06/21/2012
LOGGED BY: AW

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	RECOV.	W	NOTES
	2" Topsoil/Grass	0						Sta. 56+10 28' Right
	Clay-some sand and silt, trace root hair; very stiff; orange- brown (CL) (Coastal)		1		4-9-10-18	18		PPR= 4.0 TSF
	-no root hair; hard		2		14-25-28-28	18		PPR> 4.5 TSF
75		5	3		12-19-25-28	24		PPR> 4.5 TSF
500 Year Scour								
	Sand-trace silt; dense; orange brown (SP)		4		10-14-16-13	24		
70	-some silt, trace clay; medium dense (SP-SM)		5		14-11-16-3	24		PPR= 1.0 TSF
		10						
65	-trace silt; brown (SP)	15	6		10-9-12	6		Coarse Sand
								Groundwater measured at 13.6' after 24 hours, borehole caved-in at 14'
60	-firm	20	7		5-7-10	12		Coarse sand
55	-dense; gray	25	8		15-15-16	8		Coarse sand
50	-some clay and silt; medium dense; greenish gray (SC)	30	9		9-9-12	18	23	
45		35	10		7-12-14	18		PPR= Pocket Penetrometer Reading
								TSF= Tons per Square Foot
40	-light gray	40	11		7-9-11	18		BR000-0001-00(216) P.I.NO.0001216 APPLING/TOOMBS COUNTIES

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BORING LOG

CONTRACTED WITH: HEATH & LINEBACK ENGINEERS, INC. BORING NO.: BENT 8
PROJECT NAME: SR 4 (US 1) OVER ALTAMAHA RIVER, BRIDGE 1 DATE: 06/21/2012
JOB NO.: 2012.3351.01 DRILLER: LEON RIG: D-50 LOGGED BY: AW

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	RECOV.	W	NOTES
35	-dense	45	12		7-10-28	18		
30	-trace clay; very dense (SM)	50	13		21-35-50/5	17		
25		55	14		25-39-50/5	17		
20		60	15		29-45-50/6	18		
15	-trace silt; dense	65	16		7-15-25	18	40	
10	-very dense	70	17		29-45-50/5	17		
	BORING TERMINATED AT 70'							
5		75						
0		80						BR000-0001-00(216) P.I.NO.0001216 APPLING/TOOMBS COUNTIES

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BORING LOG

CONTRACTED WITH: HEATH & LINEBACK ENGINEERS, INC.
PROJECT NAME: SR 4 (US 1) OVER ALTAMAHA RIVER, BRIDGE 1
JOB NO.: 2012.3351.01 DRILLER: Josh RIG: CME-45

BORING NO.: BENT 9
DATE: 06/20/2012
LOGGED BY: SRF

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	RECOV.	W	NOTES
	0.5" Topsoil/Grass	0						Station 56+95 28' Right
	Clay-sandy, some silt; stiff; tan-gray (CL) (Coastal)		1		5-7-8-11	15		PPR= 4.25 TSF
75			2		11-11-11-11	24		
500 Year Scour	Sand-some silt and clay, trace root hairs; medium dense; tan-gray (SM)	5	3		5-6-9-11	24	8	
	-trace clay; firm; light tan							Groundwater measured at 8' after 24 hours; borehole caved-in at 10.1'
	-tan		4		12-10-8-8	18		
70	-loose; gray		5		4-3-2-1	18		-coarse sand
		10						
65	-trace silt; firm; tan-gray (SP)	15	6		9-8-10	12		-coarse sand
60		20	7		4-6-8	10		-coarse sand
55		25	8		6-8-10	8		-coarse sand
50	-some clay and silt; dense; greenish-gray (SC)	30	9		12-13-17	18		PPR= Pocket Penetrometer Reading TSF= Tons per Square Foot
45	-firm	35	10		5-7-7	18		
40	-medium dense; light tan	40	11		9-9-18	18	27	BR000-0001-00(216) P.I.NO. 0001216 APPLING/TOOMBS COUNTIES

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BORING LOG

CONTRACTED WITH: HEATH & LINEBACK ENGINEERS, INC. BORING NO.: BENT 9
PROJECT NAME: SR 4 (US 1) OVER ALTAMAHA RIVER, BRIDGE 1 DATE: 06/20/2012
JOB NO.: 2012.3351.01 DRILLER: Josh RIG: CME-45 LOGGED BY: SRF

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	RECOV.	W	NOTES
35	-trace clay; dense; tan (SM)	45	12		7-13-18	18		
30	-very dense; gray-tan	50	13		19-25-50/5	17		
25		55	14		18-25-36	18		
20		60	15		20-32-50/5	17		
15		65	16		14-23-27	18		
	BORING TERMINATED AT 65'							
10		70						
5		75						
0		80						BR000-0001-00(216) P.I.NO. 0001216 APPLING/TOOMBS COUNTIES

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BORING LOG

CONTRACTED WITH: HEATH & LINEBACK ENGINEERS, INC.
PROJECT NAME: SR 4 (US 1) OVER ALTAMAHA RIVER, BRIDGE 1
JOB NO.: 2012.3351.01 DRILLER: LEON RIG: D-50

BORING NO.: BENT 10
DATE: 06/20/2012
LOGGED BY: AW

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	RECOV.	W	NOTES
	1" Topsoil/Grass	0						Sta. 57+80 28' Right
	Clay-sandy, trace silt and root hair; very stiff; dark brown (CL) (Coastal)		1		9-12-12-20	10		PPR= 4.0 TSF
	Sand-some silt and clay; dense; brown (SM)		2		13-19-22-20	15		PPR= 2.0 TSF
75	-trace clay; medium dense	5	3		13-13-13-13	24		
500 Year Scour	-trace silt (SP)		4		9-11-15-13	12		
70		10	5		10-11-16-13	24	5	
								Groundwater measured at 12.6' after 24 hours, borehole caved-in at 13'
65	-firm; gray	15	6		6-8-8	12		Coarse Sand
60	-loose; gray-brown	20	7		5-4-2	6		Coarse sand
55	-medium dense	25	8		7-11-12	12		Coarse sand
50	-some clay and silt; firm; greenish gray (SC)	30	9		6-8-11	18	29	PPR= Pocket Penetrometer Reading
								TSF= Tons per Square Foot
45		35	10		5-7-9	18		
								BR000-0001-00(216) P.I.NO.0001216 APPLING/TOOMBS COUNTIES
40		40	11		6-7-9	18		

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BORING LOG

CONTRACTED WITH: HEATH & LINEBACK ENGINEERS, INC. BORING NO.: BENT 10
PROJECT NAME: SR 4 (US 1) OVER ALTAMAHA RIVER, BRIDGE 1 DATE: 06/20/2012
JOB NO.: 2012.3351.01 DRILLER: LEON RIG: D-50 LOGGED BY: AW

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	RECOV.	W	NOTES
35	-dense	45	12		7-13-28	18		
30	-trace clay; very dense (SM)	50	13		13-30-50/3	15		
25		55	14		36-49-50/4	16		
20	-some clay	60	15		19-37-50/5	17		
15		65	16		50/0	0		
	BORING TERMINATED AT 65'							
10		70						
5		75						
0		80						BR000-0001-00(216) P.I.NO.0001216 APPLING/TOOMBS COUNTIES

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BORING LOG

CONTRACTED WITH: HEATH & LINEBACK ENGINEERS, INC.
PROJECT NAME: SR 4 (US 1) OVER ALTAMAHA RIVER, BRIDGE 1
JOB NO.: 2012.3351.01 DRILLER: Josh RIG: CME-45

BORING NO.: BENT 11
DATE: 06/20/2012
LOGGED BY: SRF

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	RECOV.	W	NOTES
	1.5" Topsoil/Grass	0						Station 58+65 28' Right
	Sand-silty, some clay, trace root hair; firm; brown-tan (SM) (Coastal)		1		6-6-8-11	12		
75	-some silt, trace clay; tan		2		8-7-8-6	18		
500 Year Scour	-loose; tan-gray	5	3		4-4-4-7	24		
70	-silty; firm		4		8-6-8-7	24		
	-some silt; medium dense	10	5		5-8-13-14	24		-coarse sand
								Groundwater measure at 10.3' after 24 hours, borehole caved-in at 11'
65	-some gravel, trace silt; firm (SP)	15	6		5-7-8	18	17	-coarse sand
60	-organics, no gravel; loose	20	7		3-3-4	18		Sample recovery was 18 inches of wood
55	-no organics; medium dense; gray	25	8		6-10-11	18		-coarse sand
50	-some silt and clay; loose; light gray (SM)	30	9		6-3-3	18		
45	-firm	35	10		4-4-8	18		
40	-medium dense	40	11		7-9-14	18		BR000-0001-00(216) P.I.NO. 0001216 APPLING/TOOMBS COUNTIES

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BORING LOG

CONTRACTED WITH: HEATH & LINEBACK ENGINEERS, INC. BORING NO.: BENT 11
PROJECT NAME: SR 4 (US 1) OVER ALTAMAHA RIVER, BRIDGE 1 DATE: 06/20/2012
JOB NO.: 2012.3351.01 DRILLER: Josh RIG: CME-45 LOGGED BY: SRF

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	RECOV.	W	NOTES
35								
	-trace silt, gravel and clay; gray (SP-SM)	45	12		7-10-15	18	33	
30								
	-very dense; tan-gray	50	13		17-27-43	18		
25								
		55	14		32-31-41	18		
20								
		60	15		50/0	0		
15								
		65	16		16-21-37	18		
	BORING TERMINATED AT 65'							
10								
		70						
5								
		75						
0								
		80						
-5								

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P.I.NO. 0001216
APPLING/TOOMBS
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BORING LOG

CONTRACTED WITH: HEATH & LINEBACK ENGINEERS, INC.
PROJECT NAME: SR 4 (US 1) OVER ALTAMAHA RIVER, BRIDGE 1
JOB NO.: 2012.3351.02 DRILLER: LEON RIG: D-50

BORING NO.: BENT 11 L
DATE: 04/09/2013
LOGGED BY: AW

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	RECOV.	W	NOTES
	1.5" Topsoil/Grass	0						Station 58+65, 25' Right
75	Sand-silty, some clay, trace root hair; firm; brown-tan (SM) (Coastal)		1		3-4-7	10		
500 Year Scour		5						
70								
	-clayey, some silt, no root hair; tan-gray (SC)		2		3-3-10	18		Coarse sand from 10'
		10						
65								
		15						
60								
	-trace silt and clay; medium dense; gray (SP)		3		7-11-9	12		Coarse sand
		20						
55								
		25						
50								
	-some silt and clay, trace rock fragments; loose; light gray (SM)		4		4-3-2	15		
		30						
45								
		35						
40								BR000-0001-00(216) P.I.NO. 0001216 APPLING/TOOMBS COUNTIES
	-no rock fragmnets; firm		5		5-8-10	18		
		40						

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BORING LOG

CONTRACTED WITH: HEATH & LINEBACK ENGINEERS, INC. BORING NO.: BENT 11 L
PROJECT NAME: SR 4 (US 1) OVER ALTAMAHA RIVER, BRIDGE 1 DATE: 04/09/2013
JOB NO.: 2012.3351.02 DRILLER: LEON RIG: D-50 LOGGED BY: AW

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	RECOV.	W	NOTES
35								
		45						
30								
	-trace clay; medium dense (SP- SM)	50	6		7-9-16	18		
25								
		55						
20								
	-very dense	60	7		50/5	5		
15								
		65	8		9-15-50/5	17		
10								
		70	9		21-37-50/6	18		
5								
	-trace rock fragments (SM)	75	10		50/4	2		
0								
	-some clay and rock fragments	80	11		50/5	5		BR000-0001-00(216) P.I.NO. 0001216 APPLING/TOOMBS COUNTIES
-5								

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BORING LOG

CONTRACTED WITH: HEATH & LINEBACK ENGINEERS, INC. BORING NO.: BENT 11 L
PROJECT NAME: SR 4 (US 1) OVER ALTAMAHA RIVER, BRIDGE 1 DATE: 04/09/2013
JOB NO.: 2012.3351.02 DRILLER: LEON RIG: D-50 LOGGED BY: AW

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	RECOV.	W	NOTES
	Silt-some clay and sand; hard; greenish gray (MH)	85	12		50/5	5	31.7	PPR= 2.0 TSF
-10		90	13		50/6	6		PPR= 1.5 TSF
-15		95	14		50/5	5		PPR= 3.25 TSF
-20		100	15		50/6	6		PPR= 4.5 TSF
-25		105	16		50/6	3		PPR= 1.5 TSF
-30	Sand-some silt, trace clay; very dense; greenish gray (SM)	110	17		50/6	3		PPR=Pocket Penetrometer Reading TSF=Tons per Square Foot
-35		115	18		50/3	3	40.8	
-40		120	19		50/6	6		BR000-0001-00(216) P.I.NO. 0001216 APPLING/TOOMBS COUNTIES
-45	Clay-sandy, some silt; hard; dark gray (CH)		20		23-42-50/5	17		PPR= 1.75 TSF

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BORING LOG

CONTRACTED WITH: HEATH & LINEBACK ENGINEERS, INC. BORING NO.: BENT 11 L
PROJECT NAME: SR 4 (US 1) OVER ALTAMAHA RIVER, BRIDGE 1 DATE: 04/09/2013
JOB NO.: 2012.3351.02 DRILLER: LEON RIG: D-50 LOGGED BY: AW

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	RECOV.	W	NOTES
-50								
		130	21		50/5	5	48.3	PPR= 3.0 TSF
-55								
		135	22		50/5	0		No recovery
	BORING TERMINATED AT 135'							
-60								
		140						
-65								
		145						
-70								
		150						
-75								
		155						
-80								
		160						
-85								
		165						
								BR000-0001-00(216) P.I.NO. 0001216 APPLING/TOOMBS COUNTIES

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BORING LOG

CONTRACTED WITH: HEATH & LINEBACK ENGINEERS, INC.
PROJECT NAME: SR 4 (US 1) OVER ALTAMAHA RIVER, BRIDGE 1
JOB NO.: 2012.3351.01 DRILLER: LEON RIG: D-50

BORING NO.: BENT 12
DATE: 06/20/2012
LOGGED BY: AW

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	RECOV.	W	NOTES
	2" Topsoil/Grass	0						Sta. 59+50 28' Right
	Clay-some sand and silt, trace root hair; very stiff; orange-brown, gray (CL) (Coastal)		1		4-6-12-14	18		PPR= 3.25 TSF
75	Sand-some silt, trace clay; dense; orange-brown (SM)		2		16-17-18-13	12		Groundwater encountered at 6' at time of drilling
500 Year Scour	-medium dense	5	3		13-12-13-13	24		Wet/caved-in at 6.6' after 24 hours
	Clay-silty, trace sand; firm; orange-brown, gray (CH)		4		4-3-4-5	15	37	PPR= 1.5 TSF
70	-stiff		5		5-5-5-7	24		PPR= 1.0 TSF
		10						
65	Sand-trace silt; medium dense; gray (SP)		6		12-12-16	18		Coarse Sand
		15						
60	-firm		7		8-9-6	18		Coarse sand
		20						
55			8		7-8-11	18		Coarse sand
		25						
50			9		8-9-5	5		Coarse sand
		30						
45	-some gravel, trace clay (SM)		10		7-6-8	12	28	PPR= Pocket Penetrometer Reading TSF= Tons per Square Foot
		35						
40	-clayey, some silt, no gravel; dense (SC)		11		11-19-21	12		BR000-0001-00(216) P.I.NO.0001216 APPLING/TOOMBS COUNTIES
		40						

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BORING LOG

CONTRACTED WITH: HEATH & LINEBACK ENGINEERS, INC. BORING NO.: BENT 12
PROJECT NAME: SR 4 (US 1) OVER ALTAMAHA RIVER, BRIDGE 1 DATE: 06/20/2012
JOB NO.: 2012.3351.01 DRILLER: LEON RIG: D-50 LOGGED BY: AW

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	RECOV.	W	NOTES
35								
	-some clay (SM)	45	12		10-13-21	18		
30								
	-very dense	50	13		21-39-50/6	18		
25								
	-trace clay	55	14		50/3	1		
20								
		60	15		36-39-50/4	16		
15								
		65	16		22-50/5	11		
	BORING TERMINATED AT 65'							
10								
		70						
5								
		75						
0								
		80						
-5								BR000-0001-00(216) P.I.NO.0001216 APPLING/TOOMBS COUNTIES

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BORING LOG

CONTRACTED WITH: HEATH & LINEBACK ENGINEERS, INC.
PROJECT NAME: SR 4 (US 1) OVER ALTAMAHA RIVER, BRIDGE 1
JOB NO.: 2012.3351.01 DRILLER: LEON RIG: D-50

BORING NO.: BENT 13
DATE: 06/20/2012
LOGGED BY: AW

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	RECOV.	W	NOTES
	3" Topsoil/Grass	0						Sta. 60+35 28' Right
75	Clay-some sand and silt, trace root hair; very stiff; orange-brown, gray (CL) (Coastal)		1		4-6-11-15	12		PPR= 3.25 TSF
	Sand-some silt, trace clay; dense; gray, brown (SM)		2		13-16-16-12	15		Groundwater encountered at 5.2' at time of drilling
500 Year Scour	-medium dense		3		12-18-11-16	10		Wet/caved-in at 4.7' after 24 hours
70	Clay-silty, trace sand; brown, firm; gray(CH)		4		3-3-5-13	24		PPR= 1.0 TSF
	Sand-trace silt; dense; brown (SP-SM)	10	5		14-17-22-23	24	16	Coarse sand
65	-firm	15	6		10-10-9	10		Coarse Sand
60	-medium dense	20	7		7-10-13	12		Coarse sand
55		25	8		10-13-14	12		Coarse sand
50	-loose	30	9		9-4-5	3		Coarse sand
45	-some silt, trace clay; medium dense (SM)	35	10		11-10-15	6		PPR= Pocket Penetrometer Reading
40	-dense	40	11		12-17-28	2		TSF= Tons per Square Foot BR000-0001-00(216) P.I.NO.0001216 APPLING/TOOMBS COUNTIES

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BORING LOG

CONTRACTED WITH: HEATH & LINEBACK ENGINEERS, INC. BORING NO.: BENT 13
PROJECT NAME: SR 4 (US 1) OVER ALTAMAHA RIVER, BRIDGE 1 DATE: 06/20/2012
JOB NO.: 2012.3351.01 DRILLER: LEON RIG: D-50 LOGGED BY: AW

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	RECOV.	W	NOTES
35								
	-trace silt; very dense	45	12		11-20-30	18	36	
30		50	13		29-50/6	12		
25		55	14		21-47-50/5	17		
20		60	15		50/0	0		
15	BORING TERMINATED AT 60'	65						
10		70						
5		75						
0		80						BR000-0001-00(216) P.I.NO.0001216 APPLING/TOOMBS COUNTIES
-5								

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BORING LOG

CONTRACTED WITH: HEATH & LINEBACK ENGINEERS, INC.
PROJECT NAME: SR 4 (US 1) OVER ALTAMAHA RIVER, BRIDGE 1
JOB NO.: 2012.3351.01 DRILLER: Josh RIG: CME-45

BORING NO.: BENT 14
DATE: 06/19/2012
LOGGED BY: SRF

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	RECOV.	W	NOTES
	2" Topsoil/Grass	0						Station 61+20 38' Right
75	Clay-sandy, some silt, trace root hair; stiff; tan-gray (CL) (Coastal)		1		4-6-5-7	18		PPR> 4.5 TSF
	Sand-some silt, trace clay; medium dense; tan-gray (SM)		2		10-12-12-12	20		
500 Year Scour		5	3		8-10-13-12	24		Groundwater measured at 4' after 24 hours, borehole caved-in at 4.5'
70	-loose		4		9-5-4-5	24		
	-trace silt; medium dense; gray		5		8-12-11-7	15		-coarse sand
		10						
65								
	-firm		6		6-6-7	8		-coarse sand
		15						
60								
	(SP)		7		5-5-10	8	16	-coarse sand
		20						
55								
			8		11-8-9	10		-coarse sand
		25						
50								
	-silty (SM)		9		9-5-6	18		
		30						
45								PPR= Pocket Penetrometer Reading
								TSF= Tons per Square Foot
	-some silt; medium dense		10		7-9-13	18		
		35						
40								
								BR000-0001-00(216)
								P.I.NO. 0001216
	-very dense		11		7-38-20	18		APPLING/TOOMBS COUNTIES
		40						
35								

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BORING LOG

CONTRACTED WITH: HEATH & LINEBACK ENGINEERS, INC. BORING NO.: BENT 14
PROJECT NAME: SR 4 (US 1) OVER ALTAMAHA RIVER, BRIDGE 1 DATE: 06/19/2012
JOB NO.: 2012.3351.01 DRILLER: Josh RIG: CME-45 LOGGED BY: SRF

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	RECOV.	W	NOTES
	-dense	45	12		10-14-21	18		
30								
	-trace silt; very dense; light gray (SP-SM)	50	13		30-36-50/3	15	28	
25								
		55	14		50/5	5		
20								
		60	15		50/0	0		
15								
		65	16		16-18-32	18		
10	BORING TERMINATED AT 65'							
		70						
5								
		75						
0								
		80						
-5								

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BORING LOG

CONTRACTED WITH: HEATH & LINEBACK ENGINEERS, INC.
PROJECT NAME: SR 4 (US 1) OVER ALTAMAHA RIVER, BRIDGE 1
JOB NO.: 2012.3351.01 DRILLER: Josh RIG: CME-45

BORING NO.: BENT 16
DATE: 06/19/2012
LOGGED BY: SRF

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	RECOV.	W	NOTES
75	Topsoil = 2 inches	0						Station 62+40 38' Right
	Clay-some silt and sand, trace root hair; soft; brown-gray (CL) (Coastal)		1		2-2-2-3	24		PPR= 0.75 TSF
500 Year Scour	Sand-some silt, trace clay; firm; tan-gray (SM)		2		5-5-6-7	20		
70		5 ▽	3		7-7-8-6	16		Groundwater and caved-in measured at 5.5' after 24 hours
	Clay-silty, trace sand; stiff; gray-tan (CH)		4		6-5-5-5	24	37	PPR= 1.0 TSF
	Sand-trace silt; firm; gray (SP)		5		2-9-8-8	24		-coarse sand
65		10						
			6		8-6-8	10		-coarse sand
60		15						
	-trace gravel; loose		7		6-3-4	10		-coarse sand
55		20						
			8		4-4-4	18		-coarse sand
50		25						
	-trace clay, no gravel (SM)		9		2-3-6	18	38	
45		30						PPR= Pocket Penetrometer Reading
	-firm		10		8-6-7	18		TSF= Tons per Square Foot
40		35						
	-dense		11		13-19-21	18		BR000-0001-00(216) P.I.NO. 0001216 APPLING/TOOMBS COUNTIES
35		40						

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BORING LOG

CONTRACTED WITH: HEATH & LINEBACK ENGINEERS, INC. BORING NO.: BENT 16
PROJECT NAME: SR 4 (US 1) OVER ALTAMAHA RIVER, BRIDGE 1 DATE: 06/19/2012
JOB NO.: 2012.3351.01 DRILLER: Josh RIG: CME-45 LOGGED BY: SRF

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	RECOV.	W	NOTES
30	-medium dense	45	12		8-9-15	18		
25	-very dense (SP-SM)	50	13		18-28-29	18		
20		55	14		19-30-50/5.5	17		
15		60	15		50/0	0		
10		65	16		18-18-36	18		
5	'BORING TERMINATED AT 65	70						
0		75						
-5		80						BR000-0001-00(216) P.I.NO. 0001216 APPLING/TOOMBS COUNTIES

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BORING LOG

CONTRACTED WITH: HEATH & LINEBACK ENGINEERS, INC.
PROJECT NAME: SR 4 (US 1) OVER ALTAMAHA RIVER, BRIDGE 1
JOB NO.: 2012.3351.01 DRILLER: Josh RIG: CME-45

BORING NO.: BENT 18
DATE: 06/19/2012
LOGGED BY: SRF

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	RECOV.	W	NOTES
75	2" Topsoil/Grass	0						Station 63+60 28' Right
	Clay-some silt and sand; trace root hair; firm; tan-gray (CL) (Coastal)		1		3-2-3-3	20		PPR= 1.0 TSF
	-sandy; soft; gray-tan		2		3-2-2-2	20	24	PPR= 0.5 TSF
500 Year Scour								
70	-firm	5	3		2-3-3-4	24		PPR= 0.75 TSF
			4		5-17-17-13	24		
	Sand-some silt and clay; dense; gray (SM)							-coarse sand
	-trace silt and clay; firm	10	5		6-5-10-9	15		Groundwater measured at 9.2' after 24 hours, borehole caved-in at 10'
65								
	(SP)	15	6		8-7-5	6		-coarse sand
60								
	-some organics; loose	20	7		7-3-2	12		-large root fragments in shoe of spoon
55								
	-silty, some clay, no organic; very loose; light gray (SM)	25	8		7-2-1	18		-several 2-3" lenses of silt in sample
50								
	-some silt, trace clay; loose	30	9		2-4-2	18		-several 2-3" lenses of silt in sample
45								
	-firm	35	10		5-5-9	18		PPR= Pocket Penetrometer Reading TSF= Tons per Square Foot
40								
	-medium dense	40	11		6-10-13	18	33	BR000-0001-00(216) P.I.NO. 0001216 APPLING/TOOMBS COUNTIES
35								

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BORING LOG

CONTRACTED WITH: HEATH & LINEBACK ENGINEERS, INC. BORING NO.: BENT 18
PROJECT NAME: SR 4 (US 1) OVER ALTAMAHA RIVER, BRIDGE 1 DATE: 06/19/2012
JOB NO.: 2012.3351.01 DRILLER: Josh RIG: CME-45 LOGGED BY: SRF

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	RECOV.	W	NOTES
30	-very dense	45	12		10-20-42	18		
25		50	13		21-26-30	18		
20	-trace silt (SP-SM)	55	14		23-26-31	18		
15		60	15		17-18-35	18		
10		65	16		15-23-50/5	17		
	BORING TERMINATED AT 65'							
5		70						
0		75						
-5		80						BR000-0001-00(216) P.I.NO. 0001216 APPLING/TOOMBS COUNTIES

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BORING LOG

CONTRACTED WITH: HEATH & LINEBACK ENGINEERS, INC.
PROJECT NAME: SR 4 (US 1) OVER ALTAMAHA RIVER, BRIDGE 1
JOB NO.: 2012.3351.01 DRILLER: LEON RIG: D-50

BORING NO.: BENT 20
DATE: 06/19/2012
LOGGED BY: AW

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	RECOV.	W	NOTES
75	2" Topsoil/Grass	0						Sta. 64+80 25' Right
	Clay-silty, trace sand and root hair; stiff; orange-gray (CH) (Coastal)		1		4-5-7-9	15		PPR= 2.0 TSF
	-very stiff		2		8-9-11-10	6		PPR= 2.5 TSF
500 Year Scour 70	-some silt, no root hair; stiff	5	3		5-5-10-8	10	31	PPR= 2.5 TSF
	-some sand	▽	4		4-5-9-4	20		PPR= 2.0 TSF
65	Sand-some clay, trace silt; firm; gray (SC)	▽ 10	5		3-3-7-12	15		Groundwater encountered at 6' at time of drilling and measured at 9.3 after 24 hours, borehole caved-in at 10.5'
60	-trace silt and clay (SP)	15	6		7-8-9	18		Coarse Sand
55	-medium dense	20	7		11-13-9	18		Coarse sand
50	-firm	25	8		7-10-8	18		Coarse sand
45	-silty, some clay (SM)	30	9		4-9-6	18		PPR= Pocket Penetrometer Reading
40	-some silt, trace clay; medium dense	35	10		4-7-13	18		TSF= Tons per Square Foot
35	-some clay; very dense	40	11		13-22-30	15		BR000-0001-00(216) P.I.NO.0001216 APPLING/TOOMBS COUNTIES

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BORING LOG

CONTRACTED WITH: HEATH & LINEBACK ENGINEERS, INC. BORING NO.: BENT 20
PROJECT NAME: SR 4 (US 1) OVER ALTAMAHA RIVER, BRIDGE 1 DATE: 06/19/2012
JOB NO.: 2012.3351.01 DRILLER: LEON RIG: D-50 LOGGED BY: AW

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	RECOV.	W	NOTES
30	-trace silt, clay and gravel (SP-SM)	45	12		10-31-50/3	15	36	
25	-no gravel	50	13		20-40-50/3	15		
20		55	14		10-31-50/3	15		
15		60	15		50/1	0		
	BORING TERMINATED AT 60'							
10		65						
5		70						
0		75						
-5		80						BR000-0001-00(216) P.I.NO.0001216 APPLING/TOOMBS COUNTIES

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BORING LOG

CONTRACTED WITH: HEATH & LINEBACK ENGINEERS, INC.
BORING NO.: BENT 22
PROJECT NAME: SR 4 (US 1) OVER ALTAMAHA RIVER, BRIDGE 1
DATE: 06/19/2012
JOB NO.: 2012.3351.01 DRILLER: LEON RIG: D-50
LOGGED BY: AW

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	RECOV.	W	NOTES
75	2" Topsoil/Grass	0						Sta. 66+00 18' Right
	Clay-silty, trace sand and root hair; firm; orange-brown, gray (CH) (Coastal)		1		3-3-5-8	12		PPR= 1.5 TSF
500 Year Scour	-no root hair; stiff		2		5-6-6-6	2		PPR= 1.5 TSF
70		5	3		6-7-7-9	24		PPR= 2.0 TSF
	Sand-trace silt and clay; dense; brown (SP-SM)		4		5-21-25-36	24		Coarse sand
65			5		6-15-20-18	10	17	Groundwater encountered at 6' at time of drilling and measured at 9.5 after 24 hours, borehole caved-in at 10.5'
	-medium dense; gray (SP)	15	6		9-10-10	15		Coarse Sand
60								
	-firm	20	7		7-8-9	18		Coarse sand
55								
	-medium dense	25	8		10-12-15	18		Coarse sand
50								
	-some silt; firm (SM)	30	9		7-7-6	18		
45								
	-some clay	35	10		4-7-8	18		PPR= Pocket Penetrometer Reading
40								TSF= Tons per Square Foot
	-trace clay; medium dense	40	11		7-8-12	18		BR000-0001-00(216) P.I.NO.0001216 APPLING/TOOMBS COUNTIES
35								

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BORING LOG

CONTRACTED WITH: HEATH & LINEBACK ENGINEERS, INC. BORING NO.: BENT 22
PROJECT NAME: SR 4 (US 1) OVER ALTAMAHA RIVER, BRIDGE 1 DATE: 06/19/2012
JOB NO.: 2012.3351.01 DRILLER: LEON RIG: D-50 LOGGED BY: AW

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	RECOV.	W	NOTES
30	-trace silt; very dense (SP-SM)	45	12		15-46-50/4	16	30	
25		50	13		15-29-37	18		
20		55	14		33-50/3	9		
15		60	15		50/2	0		
10	BORING TERMINATED AT 60'	65						
5		70						
0		75						
-5		80						BR000-0001-00(216) P.I.NO.0001216 APPLING/TOOMBS COUNTIES

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BORING LOG

CONTRACTED WITH: HEATH & LINEBACK ENGINEERS, INC.
PROJECT NAME: SR 4 (US 1) OVER ALTAMAHA RIVER, BRIDGE 1
JOB NO.: 2012.3351.01 DRILLER: LEON RIG: D-50

BORING NO.: BENT 24
DATE: 06/19/2012
LOGGED BY: AW

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	RECOV.	W	NOTES
75	2" Topsoil/Grass	0						Sta. 67+20 28' Right
	Clay-silty, trace sand and root hair; firm; orange-brown, gray (CH) (Coastal)		1		2-2-3-2	24		PPR= 1.0 TSF
	-stiff		2		6-6-8-7	24		PPR= 2.0 TSF
500 Year Scour 70	-some sand and silt, no root hair (CL)	5 ▽	3		3-5-6-6	18		PPR= 2.5 TSF
	Sand-trace silt; dense; brown (SP)		4		15-20-16-24	24		Coarse sand
	-medium dense							Coarse sand
65		10	5		8-12-15-16	18		Groundwater encountered at 5.5' at time of drilling and measured at 8.5 after 24 hours, borehole caved-in at 9.1'
60	-trace clay; firm (SP-SM)	15	6		7-5-6	18	25	
55	-medium dense (SP)	20	7		7-10-12	18		Coarse sand
50		25	8		8-11-11	15		Coarse sand
45	-loose	30	9		6-3-4	10		Coarse sand
								PPR= Pocket Penetrometer Reading
40	-trace clay; medium dense (SP-SC)	35	10		7-12-15	18	38	TSF= Tons per Square Foot
								BR000-0001-00(216) P.I.NO.0001216 APPLING/TOOMBS COUNTIES
35	-dense (SP-SM)	40	11		9-15-23	18		

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BORING LOG

CONTRACTED WITH: HEATH & LINEBACK ENGINEERS, INC. BORING NO.: BENT 24
PROJECT NAME: SR 4 (US 1) OVER ALTAMAHA RIVER, BRIDGE 1 DATE: 06/19/2012
JOB NO.: 2012.3351.01 DRILLER: LEON RIG: D-50 LOGGED BY: AW

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	RECOV.	W	NOTES
30	-very dense	45	12		50/4	0		
25		50	13		20-41-48	18		
20		55	14		25-50/6	12		
15	-silty (SM)	60	15		10-25-50/5	17		
	BORING TERMINATED AT 60'							
10		65						
5		70						
0		75						
-5		80						BR000-0001-00(216) P.I.NO.0001216 APPLING/TOOMBS COUNTIES

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BORING LOG

CONTRACTED WITH: HEATH & LINEBACK ENGINEERS, INC.
PROJECT NAME: SR 4 (US 1) OVER ALTAMAHA RIVER, BRIDGE 1
JOB NO.: 2012.3351.01 DRILLER: Josh RIG: CME-45

BORING NO.: BENT 26
DATE: 06/19/2012
LOGGED BY: SRF

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	RECOV.	W	NOTES
75	Topsoil = 2 inches	0						Station 68+40 28' Right
	Clay-some silt and sand; trace root hair; stiff; gray-tan (CH) (Coastal)		1		4-5-6-6	12		PPR= 1.0 TSF
			2		5-5-7-12	20		PPR= 1.5 TSF
500 Year Scour 70		5	3		3-7-9-6	24		
	Sand-some silt, trace clay; firm; gray-tan (SM)		4		13-17-17-16	20		
	-dense; gray							Groundwater measured at 7.1' after 24 hours
	-trace silt; firm (SP-SM)		5		9-8-7-6	12		-coarse sand
65		10						
	(SP)		6		7-7-7	10		-coarse sand
60		15						
			7		6-7-9	10		-coarse sand
55		20						
			8		6-8-8	12	16	-coarse sand
50		25						
			9		9-9-10	15		
45		30						PPR= Pocket Penetrometer Reading
								TSF= Tons per Square Foot
	-silty, some clay; loose; light gray (SM)		10		3-4-4	18		
40		35						
								BR000-0001-00(216)
								P.I.NO. 0001216
	-some silt, trace clay; medium dense; gray		11		8-10-18	18		APPLING/TOOMBS COUNTIES
35		40						

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BORING LOG

CONTRACTED WITH: HEATH & LINEBACK ENGINEERS, INC. BORING NO.: BENT 26
PROJECT NAME: SR 4 (US 1) OVER ALTAMAHA RIVER, BRIDGE 1 DATE: 06/19/2012
JOB NO.: 2012.3351.01 DRILLER: Josh RIG: CME-45 LOGGED BY: SRF

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	RECOV.	W	NOTES
30	-trace silt; very dense (SP-SM)	45	12		50/4	4		
25	(SP)	50	13		16-27-42	18	28	
20		55	14		28-39-50/3	15		
15	-some silt; tan (SM)	60	15		12-25-25	18		
10	BORING TERMINATED AT 60'	65						
5		70						
0		75						
-5		80						BR000-0001-00(216) P.I.NO. 0001216 APPLING/TOOMBS COUNTIES

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BORING LOG

CONTRACTED WITH: HEATH & LINEBACK ENGINEERS, INC.
BORING NO.: BENT 28
PROJECT NAME: SR 4 (US 1) OVER ALTAMAHA RIVER, BRIDGE 1
DATE: 06/14/2012
JOB NO.: 2012.3351.01 DRILLER: Josh RIG: CME-45
LOGGED BY: SRF

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	RECOV.	W	NOTES
75	2" Topsoil/Grass	0						Station 69+60 28' Right
	Clay-silty, trace sand and root hair; soft; gray-tan (CH) (Coastal)		1		2-2-2-7	15		PPR= 1.5 TSF
	-firm		2		6-4-4-5	12		PPR= 2.25 TSF
500 Year Scour		5	3		3-3-4-4	20		
70	Sand-trace silt and clay; loose; tan (SP-SM)							Groundwater measured at 4' after 24 hours, borehole caved-in at 4.1'
	-some clay; firm; gray (SC)		4		6-6-4-3	24		
	-some silt, trace organic; very loose; dark gray	10	5		WOH/12"-1-7	24	35	
65								
	-trace silt and gravel, no organic; firm; gray-tan (SP)	15	6		8-8-8	6		-coarse sand
60								
	-medium dense	20	7		7-9-11	12		-coarse sand
55								
	-firm	25	8		3-5-5	6		-coarse sand
50								
		30	9		7-5-8	10		
45								PPR= Pocket Penetrometer Reading
								TSF= Tons per Square Foot
	-some clay; gray (SC)	35	10		6-5-6	18	32	
40								
								BR000-0001-00(216)
								P.I.NO. 0001216
	-some silt, trace clay (SM)	40	11		5-5-7	18		APPLING/TOOMBS COUNTIES
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BORING LOG

CONTRACTED WITH: HEATH & LINEBACK ENGINEERS, INC. BORING NO.: BENT 28
PROJECT NAME: SR 4 (US 1) OVER ALTAMAHA RIVER, BRIDGE 1 DATE: 06/14/2012
JOB NO.: 2012.3351.01 DRILLER: Josh RIG: CME-45 LOGGED BY: SRF

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	RECOV.	W	NOTES
30	-very dense	45	12		50/4	4		
25	-gray-tan (SP-SM)	50	13		22-30-30	18		
20		55	14		29-21-31	18		
15		60	15		50/0.5	0		
10	BORING TERMINATED AT 60'	65						
5		70						
0		75						
-5		80						BR000-0001-00(216) P.I.NO. 0001216 APPLING/TOOMBS COUNTIES

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BORING LOG

CONTRACTED WITH: HEATH & LINEBACK ENGINEERS, INC.
PROJECT NAME: SR 4 (US 1) OVER ALTAMAHA RIVER, BRIDGE 1
JOB NO.: 2012.3351.01 DRILLER: LEON RIG: D-50

BORING NO.: BENT 30
DATE: 06/18/2012
LOGGED BY: AW

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	RECOV.	W	NOTES
75	2" Topsoil/Grass	0						Sta. 70+80 28' Right
	Clay-some silt and sand, trace root hair; firm; brown (CH) (Coastal)		1		3-3-4-4	8		PPR= 2.0 TSF
	-stiff; orange		2		4-5-7-8	18		PPR= 2.0 TSF
500 Year Scour								
70	-sandy, no root hair; very stiff (CL)	5	3		13-12-9-9	20		PPR= 1.75 TSF
	Sand-some silt, trace clay; loose; gray (SP-SM)	▼	4		4-3-2-2	6		Groundwater measured at 7.3' after 24 hours, borehole caved-in at 9'
	Clay-some silt, trace sand and organic; very soft; gray (CH)	C	5		WOR-1-1-2	12		PPR= 0.25 TSF
65		10						WOR= Weight of Rod
	Sand-trace silt; firm; orange- brown (SP)		6		7-10-9	12		Coarse Sand
60		15						
	-gray-brown		7		3-4-6	12		Coarse sand
55		20						
			8		5-6-6	12		Coarse sand
50		25						
	-some gravel; medium dense		9		12-12-11	10	19	Coarse sand
45		30						
	-some clay and silt, no gravel; firm; gray (SC)		10		5-5-9	18		PPR= Pocket Penetrometer Reading
40		35						TSF= Tons per Square Foot
	-medium dense		11		8-10-13	18		BR000-0001-00(216) P.I.NO.0001216 APPLING/TOOMBS COUNTIES
35		40						

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BORING LOG

CONTRACTED WITH: HEATH & LINEBACK ENGINEERS, INC. BORING NO.: BENT 30
PROJECT NAME: SR 4 (US 1) OVER ALTAMAHA RIVER, BRIDGE 1 DATE: 06/18/2012
JOB NO.: 2012.3351.01 DRILLER: LEON RIG: D-50 LOGGED BY: AW

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	RECOV.	W	NOTES
30	-trace silt and clay, very dense (SP-SM)	45	12		50/6	6		
25		50	13		20-28-43	18	29	
20		55	14		21-50/5	11		
15	-some silt; tan (SM)	60	15		11-15-50/5	17		
10	BORING TERMINATED AT 60'	65						
5		70						
0		75						
-5		80						BR000-0001-00(216) P.I.NO.0001216 APPLING/TOOMBS COUNTIES

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BORING LOG

CONTRACTED WITH: HEATH & LINEBACK ENGINEERS, INC.
BORING NO.: BENT 32
PROJECT NAME: SR 4 (US 1) OVER ALTAMAHA RIVER, BRIDGE 1
DATE: 06/15/2012
JOB NO.: 2012.3351.01 DRILLER: LEON RIG: D-50
LOGGED BY: AW

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	RECOV.	W	NOTES
75	3" Topsoil/Grass	0						Sta. 72+00 28' Right
	Clay-silty, some sand; firm ; red-brown, gray (CH) (Coastal)		1		2-2-4-4	15		PPR= 1.5 TSF
	-very stiff		2		4-6-18-21	18		PPR= 3.5 TSF
500 Year Scour								
70	Sand-some silt and clay; medium dense; gray (SM)	5	3		6-7-16-13	18	12	
	-trace clay; firm		4		6-10-8-8	10		
	-trace silt; dense (SP)		5		11-12-18-18	15		Coarse sand
65		10						Groundwater measured at 9.2' after 24 hours, borehole caved-in at 9.8'
	-firm	15	6		9-9-10	15		Coarse Sand
60								
	-medium dense; light gray, brown	20	7		6-9-11	10		Coarse sand
55								
	-firm; gray	25	8		5-6-5	18		Coarse sand
50								
	-medium dense	30	9		8-12-16	18		Coarse sand
45								PPR= Pocket Penetrometer Reading
	-clayey; firm (SC)	35	10		6-6-6	18		TSF= Tons per Square Foot
40								BR000-0001-00(216) P.I.NO.0001216 APPLING/TOOMBS COUNTIES
	-some silt, trace clay; medium dense (SP-SM)	40	11		7-9-14	18	33	
35								

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BORING LOG

CONTRACTED WITH: HEATH & LINEBACK ENGINEERS, INC. BORING NO.: BENT 32
PROJECT NAME: SR 4 (US 1) OVER ALTAMAHA RIVER, BRIDGE 1 DATE: 06/15/2012
JOB NO.: 2012.3351.01 DRILLER: LEON RIG: D-50 LOGGED BY: AW

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	RECOV.	W	NOTES
30	-very dense	45	12		50/4	4		
25		50	13		27-50/6	8		
20		55	14		50/6	3		
15		60	15		16-33-50/4	17		
	BORING TERMINATED AT 60'							
10		65						
5		70						
0		75						
-5		80						BR000-0001-00(216) P.I.NO.0001216 APPLING/TOOMBS COUNTIES

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BORING LOG

CONTRACTED WITH: HEATH & LINEBACK ENGINEERS, INC. BORING NO.: BENT 34
PROJECT NAME: SR 4 (US 1) OVER ALTAMAHA RIVER, BRIDGE 1 DATE: 06/14/2012
JOB NO.: 2012.3351.01 DRILLER: Josh RIG: CME-45 LOGGED BY: SRF

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	RECOV.	W	NOTES
75	1.5" Topsoil/Grass	0						Station 73+20 28' Right
	Clay-silty, trace sand and root hair; soft; tan gray (CH) (Coastal)		1		2-2-2-3	20		PPR= 1.25 TSF
500 Year Scour	Sand-some silt and clay; dense; gray-tan (SM)		2		15-21-28-26	24		
70	-trace clay; medium dense	5	3		10-9-12-12	15		
	-firm		4		12-6-5-5	10		
	-trace silt; gray (SP-SM)	▽	5		7-9-8-10	20		Groundwater measured at 8.4' after 24 hours, borehole caved-in at 9.1'
65		10						
	-trace gravel; light gray (SP)		6		6-5-6	12	20	-coarse sand
60		15						
	-medium dense		7		8-12-13	15		-coarse sand
55		20						
	-firm		8		10-9-9	15		-coarse sand
50		25						
	-medium dense; gray		9		8-12-11	16		-coarse sand
45		30						
	-some silt and clay, no gravel; firm; light gray (SM)		10		6-6-9	18		PPR= Pocket Penetrometer Reading TSF= Tons per Square Foot
40		35						
	-trace clay; gray; medium dense		11		5-8-16	18		BR000-0001-00(216) P.I.NO. 0001216 APPLING/TOOMBS COUNTIES
35		40						

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BORING LOG

CONTRACTED WITH: HEATH & LINEBACK ENGINEERS, INC. BORING NO.: BENT 34
PROJECT NAME: SR 4 (US 1) OVER ALTAMAHA RIVER, BRIDGE 1 DATE: 06/14/2012
JOB NO.: 2012.3351.01 DRILLER: Josh RIG: CME-45 LOGGED BY: SRF

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	RECOV.	W	NOTES
30	-trace silt; very dense (SP-SM)	45	12	■	12-13-50/1	13		
25		50	13	■	20-28-42	18	26	
20		55	14	▨	50/0.5	0		
15		60	15	■	12-40-50/4	16		
10	BORING TERMINATED AT 60'	65						
5		70						
0		75						
-5		80						BR000-0001-00(216) P.I.NO. 0001216 APPLING/TOOMBS COUNTIES

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BORING LOG

CONTRACTED WITH: HEATH & LINEBACK ENGINEERS, INC.
PROJECT NAME: SR 4 (US 1) OVER ALTAMAHA RIVER, BRIDGE 1
JOB NO.: 2012.3351.01 DRILLER: Josh RIG: CME-45

BORING NO.: BENT 36
DATE: 06/25/2012
LOGGED BY: SRF

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	RECOV.	W	NOTES
75	2" Topsoil/Grass							Station 74+40 28' Right
	Clay-some silt and sand, trace root hair; firm; gray- tan (CH) (Coastal)		1		2-4-4-5	24		PPR= 2.0 TSF
	Sand-some silt, trace clay; firm; gray-tan (SM)		2		7-7-7-7	20	15	Groundwater at surface at time of drilling and measured at 6" after 24 hours
500 Year Scour								
70	-trace silt; medium dense; gray (SP-SM)	5	3		9-12-15-15	24		
	(SP)		4		12-15-10-10	20		-coarse sand
	-firm		5		5-7-7-9	24		-coarse sand
65		10						
60	-trace gravel; loose	15	6		6-5-4	18		-coarse sand
55		20	7		6-4-5	6		-coarse sand
50	-medium dense	25	8		9-11-10	18		-coarse sand
45	-firm	30	9		5-6-13	18		-coarse sand
								PPR= Pocket Penetrometer Reading
40	-some clay and silt, no gravel; light gray (SC)	35	10		3-5-5	18		TSF= Tons per Square Foot
								BR000-0001-00(216)
35	-trace clay; medium dense; gray (SM)	40	11		8-11-16	18		P.I.NO. 0001216 APPLING/TOOMBS COUNTIES

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BORING LOG

CONTRACTED WITH: HEATH & LINEBACK ENGINEERS, INC. BORING NO.: BENT 36
PROJECT NAME: SR 4 (US 1) OVER ALTAMAHA RIVER, BRIDGE 1 DATE: 06/25/2012
JOB NO.: 2012.3351.01 DRILLER: Josh RIG: CME-45 LOGGED BY: SRF

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	RECOV.	W	NOTES
30	-trace silt; very dense (SP-SM)	45	12		12-17-50/3	15	27	
25		50	13		50/5	4		
20		55	14		50/0	0		
15	-silty, some clay (SM)	60	15		12-37-50/5	17		
	BORING TERMINATED AT 60'							
10		65						
5		70						
0		75						
-5		80						BR000-0001-00(216) P.I.NO. 0001216 APPLING/TOOMBS COUNTIES

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BORING LOG

CONTRACTED WITH: HEATH & LINEBACK ENGINEERS, INC.
PROJECT NAME: SR 4 (US 1) OVER ALTAMAHA RIVER, BRIDGE 1
JOB NO.: 2012.3351.01 DRILLER: LEON RIG: D-50

BORING NO.: BENT 38
DATE: 06/21/2012
LOGGED BY: AW

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	RECOV.	W	NOTES
75	2" Topsoil/Grass							Sta. 75+60 28' Right
	Clay-sandy, some silt, trace root hair; stiff; brown (CL) (Coastal)		1		4-4-6-9	20		PPR= 2.5 TSF
500 Year Scour	Sand-clayey, trace silt; medium dense; brown (SC)		2		9-7-13-13	18		PPR= 3.5 TSF
70	-some clay; gray	5	3		10-12-13-10	24	15	PPR= 3.0 TSF
	-trace clay; dense (SP-SC)		4		11-17-18-15	24		Water 3" above surface at time of drilling
65	-firm (SP)	10	5		6-5-5-6	12		Coarse sand
								Groundwater measured at 2.6 after one week , borehole caved-in at 3.1'
60		15	6		9-9-9	18		Coarse Sand
55	-medium dense	20	7		8-13-14	10		Coarse sand
50	-dense	25	8		12-12-18	18		Coarse sand
45		30	9		13-18-28	15		Coarse sand
								PPR= Pocket Penetrometer Reading
40	-firm (SP-SC)	35	10		3-5-9	18	30	TSF= Tons per Square Foot
								BR000-0001-00(216) P.I.NO.0001216 APPLING/TOOMBS COUNTIES
35	-dense (SP-SM)	40	11		9-14-18	18		

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BORING LOG

CONTRACTED WITH: HEATH & LINEBACK ENGINEERS, INC. BORING NO.: BENT 38
PROJECT NAME: SR 4 (US 1) OVER ALTAMAHA RIVER, BRIDGE 1 DATE: 06/21/2012
JOB NO.: 2012.3351.01 DRILLER: LEON RIG: D-50 LOGGED BY: AW

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	RECOV.	W	NOTES
30	-very dense	45	12		50/5	5		
25		50	13		29-45-50/5	17		
20		55	14		21-50/5	11		
15	-some silt (SM)	60	15		11-25-50/5	17		
	BORING TERMINATED AT 60'							
10		65						
5		70						
0		75						
-5		80						BR000-0001-00(216) P.I.NO.0001216 APPLING/TOOMBS COUNTIES

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BORING LOG

CONTRACTED WITH: HEATH & LINEBACK ENGINEERS, INC.
BORING NO.: BENT 40
PROJECT NAME: SR 4 (US 1) OVER ALTAMAHA RIVER, BRIDGE 1
DATE: 06/14/2012
JOB NO.: 2012.3351.01 DRILLER: LEON RIG: D-50
LOGGED BY: AW

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	RECOV.	W	NOTES
75	3" Topsoil/Grass	0						Sta. 76+80 28' Right
	Clay-some sand and silt; firm; orange-brown, gray (CL) (Coastal)		1		2-3-3-5	15		PPR= 1.5 TSF
500 Year Scour	Sand-trace silt and clay; medium dense; gray-brown (SM)	▽	2		6-10-13-12	24		Groundwater measured at 3.3' after 24 hours, borehole caved-in at 6'
70	-clayey (SC)	5	3		6-10-13-12	18		
	-trace clay (SP-SM)		4		10-14-12-11	18	20	
	-gray (SP)	10	5		9-12-9-6	15		Coarse sand
65								
60		15	6		6-10-10	15		Coarse Sand
	-firm	20	7		5-6-13	12		Coarse sand
55								
	-medium dense	25	8		8-10-16	15		Coarse sand
50								
	-dense	30	9		8-11-20	18		Coarse sand
45								PPR= Pocket Penetrometer Reading
	-loose (SP-SC)	35	10		5-3-5	18		TSF= Tons per Square Foot
40								
	-firm (SP-SM)	40	11		6-6-8	18		BR000-0001-00(216) P.I.NO.0001216 APPLING/TOOMBS COUNTIES
35								

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BORING LOG

CONTRACTED WITH: HEATH & LINEBACK ENGINEERS, INC. BORING NO.: BENT 40
PROJECT NAME: SR 4 (US 1) OVER ALTAMAHA RIVER, BRIDGE 1 DATE: 06/14/2012
JOB NO.: 2012.3351.01 DRILLER: LEON RIG: D-50 LOGGED BY: AW

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	RECOV.	W	NOTES
30	-dense; greenish gray	45	12		8-15-29	18	28	
25	-very dense	50	13		17-40-49	18		
20		55	14		15-21-45	18		
15	-dense	60	15		7-20-26	18		
10	-very dense	65	16		16-35-50/4	16		
	BORING TERMINATED AT 65'							
5		70						
0		75						
-5		80						

BR000-0001-00(216)
P.I.NO.0001216
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BORING LOG

CONTRACTED WITH: HEATH & LINEBACK ENGINEERS, INC.
PROJECT NAME: SR 4 (US 1) OVER ALTAMAHA RIVER, BRIDGE 1
JOB NO.: 2012.3351.01 DRILLER: Josh RIG: CME-45

BORING NO.: BENT 42
DATE: 06/14/2012
LOGGED BY: SRF

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	RECOV.	W	NOTES
	1" Topsoil/Grass	0						Station 78+00 28' Right
	Sand-some silt and clay; trace root hair; medium dense; brown-gray (SM) (Coastal)		1		7-10-12-19	24		
75	-trace clay; very dense; tan		2		27-32-28-22	24		
500 Year Scour	-trace silt; medium dense; light tan (SP-SM)	5	3		19-17-23-20	24		
			4		32-22-17-15	24		Groundwater encountered at 8' at time of drilling
70	-firm (SP)	▽	5		7-8-11-13	10		-coarse sand
		10 ▽						Groundwater and caved-in measured at 10.5' after 24 hours
65	-medium dense	15	6		7-10-15	10		-coarse sand
60	-some gravel; firm	20	7		6-5-5	8		-coarse sand
55	-trace gravel	25	8		9-8-7	15		
50	-no gravel; medium dense; gray (SP-SM)	30	9		11-12-10	16	19	
45		35	10		12-12-16	15		
40	-some silt and clay; loose (SM)	40	11		3-2-3	18		BR000-0001-00(216) P.I.NO. 0001216 APPLING/TOOMBS COUNTIES

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BORING LOG

CONTRACTED WITH: HEATH & LINEBACK ENGINEERS, INC. BORING NO.: BENT 42
PROJECT NAME: SR 4 (US 1) OVER ALTAMAHA RIVER, BRIDGE 1 DATE: 06/14/2012
JOB NO.: 2012.3351.01 DRILLER: Josh RIG: CME-45 LOGGED BY: SRF

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	RECOV.	W	NOTES
35								
	-medium dense	45	12		5-10-10	18		
30								
	-dense	50	13		8-13-29	18		
25								
	-very dense	55	14		19-22-33	18		
20								
	-dense	60	15		13-14-21	18		
15								
	-trace clay	65	16		8-15-22	18	42	
10								
	-very dense	70	17		22-33-50/5"	17		
5								
		75	18		12-28-50/1"	12		
	BORING TERMINATED AT 75'							
0		80						BR000-0001-00(216) P.I.NO. 0001216 APPLING/TOOMBS COUNTIES
-5								

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BORING LOG

CONTRACTED WITH: HEATH & LINEBACK ENGINEERS, INC.
PROJECT NAME: SR 4 (US 1) OVER ALTAMAHA RIVER, BRIDGE 1
JOB NO.: 2012.3351.01 DRILLER: Josh RIG: CME-45

BORING NO.: BENT 44
DATE: 06/14/2012
LOGGED BY: SRF

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	RECOV.	W	NOTES
	0.5" Topsoil/Grass	0						Station 79+20 28' Right
	Sand-some silt and clay; trace root hair; firm; brown-tan (SM) (Coastal)		1		4-5-8-9	20		
75			2		7-7-7-9	24		
500 Year Scour	-medium dense	5	3		8-9-11-13	24		
			4		6-5-10-13	24		PPR= 1.75 TSF
70	Clay-sandy, some silt; stiff; tan-gray (CL)							
	Sand-trace silt; medium dense; light tan (SP-SM)		5		11-11-11-11	6		
		10 C						No groundwater measured after 24 hours, borehole caved-in at 10.8'
65	-firm; light gray	▽ 15	6		3-4-6	6		-coarse sand Groundwater encountered at 13.5' at time of drilling
60	-loose (SP)	20	7		5-4-3	6	21	-coarse sand
55		25	8		6-5-4	6		-coarse sand
50		30	9		5-4-3	5		-coarse sand
45	-dense; gray	35	10		8-13-18	10		-coarse sand
40	-silty, some clay; loose (SM)	40	11		3-3-3	18		BR000-0001-00(216) P.I.NO. 0001216 APPLING/TOOMBS COUNTIES

PPR= Pocket Penetrometer Reading
TSF= Tons per Square Foot

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BORING LOG

CONTRACTED WITH: HEATH & LINEBACK ENGINEERS, INC. BORING NO.: BENT 44
PROJECT NAME: SR 4 (US 1) OVER ALTAMAHA RIVER, BRIDGE 1 DATE: 06/14/2012
JOB NO.: 2012.3351.01 DRILLER: Josh RIG: CME-45 LOGGED BY: SRF

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	RECOV.	W	NOTES
35								
	-some silt; firm	45	12		4-5-7	18		
30								
	-trace silt and clay; dense (SP-SM)	50	13		10-12-20	18		Difficult drilling from 50.5' to 53'
25								
		55	14		15-16-17	18	27	
20								
	-very dense	60	15		50/0.5	0		
15								
		65	16		12-23-50/5	17		
10								
	-some silt (SM)	70	17		12-25-50/4	15		
5								
		75	18		16-34-50/5	17		
	BORING TERMINATED AT 75'							
0								
		80						BR000-0001-00(216) P.I.NO. 0001216 APPLING/TOOMBS COUNTIES
-5								

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BORING LOG

CONTRACTED WITH: HEATH & LINEBACK ENGINEERS, INC.
PROJECT NAME: SR 4 (US 1) OVER ALTAMAHA RIVER, BRIDGE 1
JOB NO.: 2012.3351.01 DRILLER: LEON RIG: D-50

BORING NO.: BENT 46
DATE: 06/14/2012
LOGGED BY: AW

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	RECOV.	W	NOTES
	2" Topsoil/Grass	0						Sta. 80+40 8' Right
	Sand-some silt and clay; loose; brown (SM) (Coastal)		1		3-4-4-5	15		PPR= 2.0 TSF
75	-trace clay; medium dense		2		8-10-10-10	18		PPR= 1.5 TSF
500 Year Scour	-firm; orange-brown	5	3		5-5-8-10	20		
	-trace silt; medium dense; brown (SP)		4		9-11-11--11	24	14	Coarse sand
70			5		8-10-13-13	20		Coarse sand
		10						No Groundwater measured after 24 hours, wet and caved-in at 10.5'
65	-firm	15	6		9-10-9	15		Coarse Sand
60		20	7		6-8-10	18		Coarse sand
55		25	8		7-6-5	18		Coarse sand
50	-medium dense; light gray	30	9		8-11-15	18		Coarse sand
								PPR= Pocket Penetrometer Reading
45								TSF= Tons per Square Foot
		35	10		11-11-16	18		Coarse sand
40								BR000-0001-00(216) P.I.NO.0001216 APPLING/TOOMBS COUNTIES
	-some clay and silt; firm; greenish gray (SC)	40	11		5-6-8	18	33	

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BORING LOG

CONTRACTED WITH: HEATH & LINEBACK ENGINEERS, INC. BORING NO.: BENT 46
PROJECT NAME: SR 4 (US 1) OVER ALTAMAHA RIVER, BRIDGE 1 DATE: 06/14/2012
JOB NO.: 2012.3351.01 DRILLER: LEON RIG: D-50 LOGGED BY: AW

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	RECOV.	W	NOTES
35								
		45	12		7-7-11	18		
30								
	-trace clay; dense (SM)	50	13		10-16-29	18		
25								
	-very dense	55	14		50/5	3		
20								
		60	15		50/0	0		
15								
	-silty	65	16		13-30-42	18		
	BORING TERMINATED AT 65'							
10								
		70						
5								
		75						
0								
		80						
-5								BR000-0001-00(216) P.I.NO.0001216 APPLING/TOOMBS COUNTIES

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BORING LOG

CONTRACTED WITH: HEATH & LINEBACK ENGINEERS, INC.
PROJECT NAME: SR 4 (US 1) OVER ALTAMAHA RIVER, BRIDGE 1
JOB NO.: 2012.3351.01 DRILLER: LEON RIG: D-50

BORING NO.: BENT 48
DATE: 06/19/2012
LOGGED BY: AW

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	RECOV.	W	NOTES
	3" Topsoil/Grass	0						Sta. 81+60 28' Right
	Sand-some silt and clay, trace root hair; loose; brown (SC) (Coastal)		1		2-4-5-7	10		PPR= 2.5 TSF
75	-clayey, no root hair; dense; orange, gray		2		10-15-20-29	10		PPR= 4.0 TSF
500 Year Scour	-some clay; very dense	5	3		15-22-28-27	15		PPR> 4.5 TSF
	-trace clay; dense		4		15-15-15-19	18		PPR> 4.5 TSF
70			5		14-23-23-23	6		PPR= 4.0 TSF
		10						No Groundwater measured after 24 hours, wet and caved-in at 10.3'
65								
	-trace silt; medium dense; light gray (SP)		6		6-8-12	18		Coarse sand
		15						
60								
	-firm; brown		7		6-6-5	5		Coarse sand
		20						
55								
	-trace gravel		8		7-9-7	12	20	Coarse sand
		25						
50								
	-no gravel; medium dense; gray		9		10-11-17	18		Coarse sand
		30						PPR= Pocket Penetrometer Reading
45								TSF= Tons per Square Foot
			10		9-11-17	18		Coarse sand
		35						
40								BR000-0001-00(216) P.I.NO.0001216 APPLING/TOOMBS COUNTIES
	-firm (SP-SM)		11		10-10-7	15		
		40						

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BORING LOG

CONTRACTED WITH: HEATH & LINEBACK ENGINEERS, INC. BORING NO.: BENT 48
PROJECT NAME: SR 4 (US 1) OVER ALTAMAHA RIVER, BRIDGE 1 DATE: 06/19/2012
JOB NO.: 2012.3351.01 DRILLER: LEON RIG: D-50 LOGGED BY: AW

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	RECOV.	W	NOTES
35								
	-very dense	45	12		16-23-34	18		
30								
		50	13		15-28-40	8	36	
25								
		55	14		50/1	0		
20								
		60	15		16-45-50/3	15		
	BORING TERMINATED AT 60'							
15		65						
10		70						
5		75						
0		80						
-5								BR000-0001-00(216) P.I.NO.0001216 APPLING/TOOMBS COUNTIES

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BORING LOG

CONTRACTED WITH: HEATH & LINEBACK ENGINEERS, INC.
PROJECT NAME: SR 4 (US 1) OVER ALTAMAHA RIVER, BRIDGE 1
JOB NO.: 2012.3351.01 DRILLER: Josh RIG: CME-45

BORING NO.: BENT 50
DATE: 06/13/2012
LOGGED BY: SRF

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	RECOV.	W	NOTES
	2" Topsoil/Grass	0						Station 82+80 23' Right
	Clay-some silt and sand; stiff; brown-gray (CL) (Coastal)		1		3-4-5-6	20		PPR= 1.5 TSF
75	Sand-some silt and clay; firm; tan-brown (SM)		2		7-7-11-12	20		
500 Year Scour	-trace silt and clay; firm (SP-SM)	5	3		3-6-8-8	20		
	-medium dense		4		10-12-11-11	15		
70	-firm	▽	5		8-7-10-11	12		Groundwater encountered at 8' at time of drilling and measured at 9.6' after 24 hours, borehole caved-in at 10.7'
		▽						
65								
	-light gray (SP)	15	6		6-8-8	15		-coarse sand
60								
		20	7		7-7-7	15		-coarse sand
55								
		25	8		5-4-6	8		-coarse sand
50								
	-medium dense; gray	30	9		13-10-14	8		-coarse sand
								PPR= Pocket Penetrometer Reading
45								TSF= Tons per Square Foot
		35	10		8-12-12	6		-coarse sand
40								BR000-0001-00(216)
	-loose (SP-SM)	40	11		4-3-5	18	33	P.I.NO. 0001216 APPLING/TOOMBS COUNTIES

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BORING LOG

CONTRACTED WITH: HEATH & LINEBACK ENGINEERS, INC. BORING NO.: BENT 50
PROJECT NAME: SR 4 (US 1) OVER ALTAMAHA RIVER, BRIDGE 1 DATE: 06/13/2012
JOB NO.: 2012.3351.01 DRILLER: Josh RIG: CME-45 LOGGED BY: SRF

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	RECOV.	W	NOTES
35								
	-very dense; light gray	45	12		50/3	3		
30								
	-dense; gray	50	13		12-15-24	18		
25								
	-very dense	55	14		17-24-50/5	16		
20								
		60	15		50/3	1		
15								
	-some silt (SM)	65	16		12-18-33	18	34	
10								
		70	17		12-30-50/4	16		
	BORING TERMINATED AT 70'							
5								
		75						
0								
		80						BR000-0001-00(216) P.I.NO. 0001216 APPLING/TOOMBS COUNTIES
-5								

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BORING LOG

CONTRACTED WITH: HEATH & LINEBACK ENGINEERS, INC.
BORING NO.: BENT 52
PROJECT NAME: SR 4 (US 1) OVER ALTAMAHA RIVER, BRIDGE 1
DATE: 06/13/2012
JOB NO.: 2012.3351.01 DRILLER: Josh RIG: CME-45
LOGGED BY: SRF

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	RECOV.	W	NOTES
	1" Topsoil/Grass	0						Station 84+00 28' Right
75	Sand-clayey, some silt, trace root hair; loose; tan-gray (Coastal) (SC)		1		2-3-3-6	24		
	-firm		2		6-7-11-20	24		
500 Year Scour	-trace clay; medium dense; tan-light gray (SM)	5	3		9-11-13-15	20		
70	-trace silt; tan (SP-SM)		4		11-11-10-10	12		
		▽	5		9-11-11-11	15		Groundwater encountered at 8' at time of drilling and measured at 9.7' after 24 hours, borehole caved-in at 10.2'
65								
	-firm; light gray (SP)	15	6		5-5-8	10	22	-coarse sand
60								
		20	7		7-6-6	8		-coarse sand
55								
	-some gravel	25	8		6-5-6	10		-coarse sand
50								
	-dense	30	9		13-16-15	18		-coarse sand
45								
	-no gravel; firm; gray (SP-SM)	35	10		7-7-9	18		
40								
	-silty; some clay (SM)	40	11		5-8-8	18		BR000-0001-00(216) P.I.NO. 0001216 APPLING/TOOMBS COUNTIES

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BORING LOG

CONTRACTED WITH: HEATH & LINEBACK ENGINEERS, INC. BORING NO.: BENT 52
PROJECT NAME: SR 4 (US 1) OVER ALTAMAHA RIVER, BRIDGE 1 DATE: 06/13/2012
JOB NO.: 2012.3351.01 DRILLER: Josh RIG: CME-45 LOGGED BY: SRF

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	RECOV.	W	NOTES
35								
	-trace silt and clay; medium dense (SP-SM)	45	12		14-11-17	18		
30								
	-dense	50	13		10-11-21	18		
25								
	-very dense	55	14		22-29-50/4	16	28	
20								
		60	15		50/1	0		
15								
	-medium dense; some gravel	65	16		28-10-14	18		
10								
	-some silt; very dense; light greenish gray (SM)	70	17		14-22-36	17		
5								
		75	18		50/3	3		
	BORING TERMINATED AT 75'							
0								
		80						BR000-0001-00(216) P.I.NO. 0001216 APPLING/TOOMBS COUNTIES
-5								

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BORING LOG

CONTRACTED WITH: HEATH & LINEBACK ENGINEERS, INC.
BORING NO.: BENT 54
PROJECT NAME: SR 4 (US 1) OVER ALTAMAHA RIVER, BRIDGE 1
DATE: 06/13/2012
JOB NO.: 2012.3351.01 DRILLER: Josh RIG: CME-45
LOGGED BY: SRF

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	RECOV.	W	NOTES
75	1" Topsoil/Grass	0						Station 85+20 18' Right
	Clay-some silt and sand; firm; gray-tan (CL) (Coastal)		1		3-2-3-5	24		PPR= 1.25 TSF
500 Year Scour	Sand-some silt and clay; trace root hair; medium dense; tan-gray (SM)		2		9-10-12-15	20		Standing water at surface at time of drilling
70	-trace silt and clay, no root hair; dense; light tan (SP-SM)	5	3		2-11-22-20	10		Groundwater encountered at 8' at time of drilling and measured at 8.8' after 24 hours, borehole caved-in at 24.2'
			4		17-16-16-14	12		
	-firm; gray-tan (SP)	10	5		10-10-9-8	12	19	-coarse sand
65								
	-light tan	15	6		7-6-8	12		-coarse sand
60								
	-light tan-gray	20	7		10-9-10	6		-coarse sand
55								
	-medium dense	25	8		10-15-8	8		-coarse sand
50								
		30	9		12-12-15	10		-coarse sand
45								
	-some clay (SC)	35	10		7-8-18	18	46	PPR= Pocket Penetrometer Reading TSF= Tons per Square Foot
40								
	-clayey; light gray	40	11		10-12-14	18		BR000-0001-00(216) P.I.NO. 0001216 APPLING/TOOMBS COUNTIES
35								

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BORING LOG

CONTRACTED WITH: HEATH & LINEBACK ENGINEERS, INC. BORING NO.: BENT 54
PROJECT NAME: SR 4 (US 1) OVER ALTAMAHA RIVER, BRIDGE 1 DATE: 06/13/2012
JOB NO.: 2012.3351.01 DRILLER: Josh RIG: CME-45 LOGGED BY: SRF

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	RECOV.	W	NOTES
30	-trace clay; gray (SP-SM)	45	12		10-13-16	18		
25	-very dense	50	13		17-23-38	18		
20		55	14		50/5.5	5		
15		60	15		50/5.5	5		
10		65	16		50/5.5	5		
	BORING TERMINATED AT 65'							
5		70						
0		75						
-5		80						BR000-0001-00(216) P.I.NO. 0001216 APPLING/TOOMBS COUNTIES

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BORING LOG

CONTRACTED WITH: HEATH & LINEBACK ENGINEERS, INC.
PROJECT NAME: SR 4 (US 1) OVER ALTAMAHA RIVER, BRIDGE 1
JOB NO.: 2012.3351.01 DRILLER: Josh RIG: CME-45

BORING NO.: BENT 56
DATE: 06/12/2012
LOGGED BY: SRF

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	RECOV.	W	NOTES
75	2" Topsoil/Grass							Station 86+45 18' Right
	Clay-sandy, some silt, trace organic; soft; gray-brown (CL) (Coastal)		1		1-1-3-2	24		PPR= 1.25 TSF
	-stiff		2		3-5-6-8	24		PPR= 1.5 TSF
500 Year Scour		5						
70	Sand-some clay, trace silt; dense; gray (SC)		3		8-16-29-12	20	15	Standing water at surface at time of drilling
	-trace clay; medium dense (SP- SM)		4		8-13-16-16	20		Groundwater measured at 6" after 24 hours
	-firm		5		12-8-8-8	24		
65		10						
	-tan (SP)		6		5-7-7	12		-coarse sand
60		15						
			7		2-4-6	14		-coarse sand
55		20						
			8		5-6-5	12		-coarse sand
50		25						
	-some silt; medium dense; gray (SM)		9		6-9-11	18	23	
45		30						PPR= Pocket Penetrometer Reading
								TSF= Tons per Square Foot
	-trace silt and gravel; firm		10		11-10-3	8		
40		35						
								BR000-0001-00(216)
								P.I.NO. 0001216
	-some gravel; medium dense (SP)		11		5-7-15	12		APPLING/TOOMBS COUNTIES
35		40						

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BORING LOG

CONTRACTED WITH: HEATH & LINEBACK ENGINEERS, INC. BORING NO.: BENT 56
PROJECT NAME: SR 4 (US 1) OVER ALTAMAHA RIVER, BRIDGE 1 DATE: 06/12/2012
JOB NO.: 2012.3351.01 DRILLER: Josh RIG: CME-45 LOGGED BY: SRF

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	RECOV.	W	NOTES
30		45	12		11-11-16	11		
25	-some silt; very dense (SM)	50	13		11-22-50/5.5	17		
20		55	14		50/3	3		
15		60	15		41-50/1	6		
10		65	16		15-32-50/5	17		
	BORING TERMINATED AT 65'							
5		70						
0		75						
-5		80						

BR000-0001-00(216)
P.I.NO. 0001216
APPLING/TOOMBS
COUNTIES

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BORING LOG

CONTRACTED WITH: HEATH & LINEBACK ENGINEERS, INC.
PROJECT NAME: SR 4 (US 1) OVER ALTAMAHA RIVER, BRIDGE 1
JOB NO.: 2012.3351.01 DRILLER: Josh RIG: CME-45

BORING NO.: BENT 58
DATE: 06/25/2012
LOGGED BY: SRF

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	RECOV.	W	NOTES
	2" Topsoil/Grass	0						Station 87+60 28' Right
	Sand-some silt, trace clay and root hair; loose; tan (Fill) (SM)		1		4-4-3-4	12		
75	Clay-some silt and sand; firm; gray-brown (CH)		2		3-3-3-3	24		PPR= 0.5 TSF
500 Year Scour		5	3		3-2-5-8	24		
	Sand-some silt, trace clay; loose; tan (SM) (Coastal)							
	-medium dense		4		7-11-11-11	10		
70	-trace silt; firm (SP-SM)		5		8-8-9-7	20	21	
		10						
65								
	-gray (SP)		6		8-9-8	10		-coarse sand
		15						
60								
			7		8-8-10	18		-coarse sand
		20						
55								
			8		9-6-8	10		-coarse sand
		25						
50								
			9		6-7-11	18		-coarse sand
		30						
45								PPR= Pocket Penetrometer Reading TSF= Tons per Square Foot
	-medium dense		10		10-11-12	10		
		35						
40								BR000-0001-00(216) P.I.NO. 0001216 APPLING/TOOMBS COUNTIES
	-firm		11		5-6-6	6	21	
		40						

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BORING LOG

CONTRACTED WITH: HEATH & LINEBACK ENGINEERS, INC. BORING NO.: BENT 58
PROJECT NAME: SR 4 (US 1) OVER ALTAMAHA RIVER, BRIDGE 1 DATE: 06/25/2012
JOB NO.: 2012.3351.01 DRILLER: Josh RIG: CME-45 LOGGED BY: SRF

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	RECOV.	W	NOTES
35								
	-some silt; medium dense (SM)	45	12		5-8-15	18		
30								
	-dense	50	13		11-17-28	18		
25								
		55	14		20-37-50/4	16		
20								
		60	15		50/0	0		
15								
		65	16		50/2	2		
	BORING TERMINATED AT 65'							
10								
		70						
5								
		75						
0								
		80						BR000-0001-00(216) P.I.NO. 0001216 APPLING/TOOMBS COUNTIES
-5								

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BORING LOG

CONTRACTED WITH: HEATH & LINEBACK ENGINEERS, INC.
BORING NO.: BENT 59
PROJECT NAME: SR 4 (US 1) OVER ALTAMAHA RIVER, BRIDGE 1
DATE: 06/19/2012
JOB NO.: 2012.3351.01 DRILLER: Josh RIG: CME-45
LOGGED BY: SRF

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	RECOV.	W	NOTES
	1.5" Topsoil/Grass	0						Sta. 88+20 58' Right
	Sand-some silt, trace clay and gravel; firm; brown (SM) (Fill)		1		10-7-8-12	20		
80			2		10-5-8-10	18		
	-trace silt, no gravel (SP-SM)	5	3		5-5-7-7	24		
	Sand-some clay and silt; firm; brown (SC) (Coastal)		4		7-10-8-14	20		
75	-dense; gray-brown		5		10-15-20-33	18		
		10						
70								
	Clay-sandy, trace silt; very stiff; gray (CL)		6		10-10-12	18		
		15						
65								
	Sand-trace silt and clay; medium dense; light gray (SP- SM)		7		10-10-12	18	18	
		20						
60								
	-loose (SP)		8		10-6-3	18		Coarse sand
		25						
55								
	-firm (SP-SM)		9		7-7-8	18		
		30						
50								
			10		8-8-10	18		
		35						
45								BR000-0001-00(216) P.I.NO.0001216 APPLING/TOOMBS COUNTIES
			11		11-8-9	15		
		40						

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BORING LOG

CONTRACTED WITH: HEATH & LINEBACK ENGINEERS, INC. BORING NO.: BENT 59
PROJECT NAME: SR 4 (US 1) OVER ALTAMAHA RIVER, BRIDGE 1 DATE: 06/19/2012
JOB NO.: 2012.3351.01 DRILLER: Josh RIG: CME-45 LOGGED BY: SRF

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	RECOV.	W	NOTES
40								
	-gray	45	12		10-7-8	18		
35								
	-some clay; dense (SC)	50	13		11-16-18	18	23	
30								
	-some silt, trace clay; very dense (SM)	55	14		15-32-34	18		
25								
		60	15		26-43-50/3	15		
20								
		65	16		50/2	2		
15								
		70	17		14-33-46	18		
	BORING TERMINATED AT 70'							
10								
		75						
5								
		80						BR000-0001-00(216) P.I.NO.0001216 APPLING/TOOMBS COUNTIES
0								

5SUMMARY OF USCS TESTS

Project No.: 2012.3351.01
Project Name: SR 4 (US 1) Over Altamaha River, Bridge 1

Contract No.: BR000-0001-00(216)
P.I. NO. 0001216
Counties: Appling/ Toombs

Lab. No.	59	60	61	62
Sample No.	1	2	3	4
Station	47+40 48' Right	47+40 48' Right	48+80 22' Left	48+80 22' Left
Location	Bent 1 20' Right	Bent 1 20' Right	Bent 2 50' Left	Bent 2 50' Left
Depth (ft)	8-10	23.5-25	108.5-110	123.5-125
PHYSICAL TESTS				
2-1/2" Sieve	100	100	100	100
1-1/2" Sieve	100	100	100	100
#10 Sieve	99.3	99.0	99.7	100
#40 Sieve	87.5	68.6	93.3	99.8
#60 Sieve	76.4	37.8	78.8	99.3
#200 Sieve	50.4	16.5	14.0	55.1
Liquid Lmt. (%)	64	NP	NP	71
Plast. Index (%)	48	NP	NP	50
Moisture (%)	18.9	11.8	35.0	52.6
Organics (%)	-	-	-	-
Unified Soil Classification	CH	SM	SM	CH
TESTING DATES				
Date Sampled	06/29/2012	06/29/2012	06/28/2012	06/28/2012
Date Completed	07/27/2012	07/27/2012	07/27/2012	07/27/2012
Date Received	07/12/2012	07/12/2012	07/12/2012	07/12/2012

Remarks: _____

Respectfully Submitted: _____

NP: Non-Plastic

SUMMARY OF USCS TESTS

Project No.: 2012.3351.01
Project Name: SR 4 (US 1) Over Altamaha River, Bridge 1

Contract No.: BR000-0001-00(216)
P.I. NO. 0001216
Counties: Appling/ Toombs

Lab. No.	63	64	65	66
Sample No.	5	6	7	8
Station	50+20 22' Left	50+20 22' Left	51+60 22' Left	51+60 22' Left
Location	Bent 3 50' Left	Bent 3 50' Left	Bent 4 50' Left	Bent 4 50' Left
Depth (ft)	103.5-105	123.5-125	78.5-80	113.5-115
PHYSICAL TESTS				
2-1/2" Sieve	100	100	100	100
1-1/2" Sieve	100	100	100	100
#10 Sieve	99.8	96.7	100	100
#40 Sieve	96.5	93.7	99.5	99.7
#60 Sieve	75.0	92.5	98.8	96.6
#200 Sieve	14.7	51.3	52.4	11.3
Liquid Lmt. (%)	NP	89	148	34
Plast. Index (%)	NP	64	111	10
Moisture (%)	31.6	58.0	65.0	25.7
Organics (%)	-	-	-	-
Unified Soil Classification	SM	CH	CH	SP-SC
TESTING DATES				
Date Sampled	06/27/2012	06/27/2012	06/27/2012	06/27/2012
Date Completed	07/27/2012	07/27/2012	07/27/2012	07/27/2012
Date Received	07/12/2012	07/12/2012	07/12/2012	07/12/2012

Remarks: _____

Respectfully Submitted: _____

NP: Non-Plastic

SUMMARY OF USCS TESTS

Project No.: 2012.3351.01
Project Name: SR 4 (US 1) Over Altamaha River, Bridge 1

Contract No.: BR000-0001-00(216)
P.I. NO. 0001216
Counties: Appling/ Toombs

Lab. No.	23	24	67	68
Sample No.	9	10	11	12
Station	53+00 28' Right	53+00 28' Right	54+40 8' Right	54+40 8' Right
Location	Bent 5 Centerline	Bent 5 Centerline	Bent 6 20' Left	Bent 6 20' Left
Depth (ft)	4-6	43.5-45	13.5-15	58.5-60
PHYSICAL TESTS				
2-1/2" Sieve	100	100	100	100
1-1/2" Sieve	100	100	100	100
#10 Sieve	100	99.8	94.9	99.3
#40 Sieve	99.6	81.6	78.5	94.4
#60 Sieve	99.1	52.5	60.3	76.2
#200 Sieve	89.2	8.9	24.9	12.9
Liquid Lmt. (%)	50	NP	30	NP
Plast. Index (%)	30	NP	15	NP
Moisture (%)	38.3	31.9	33.9	33.2
Organics (%)	-	-	-	-
Unified Soil Classification	CH	SP-SM	SC	SM
TESTING DATES				
Date Sampled	06/31/2012	06/31/2012	06/21/2012	06/21/2012
Date Completed	07/27/2012	07/27/2012	07/27/2012	07/27/2012
Date Received	06/22/2012	06/22/2012	07/12/2012	07/12/2012

Remarks: _____

Respectfully Submitted: _____

NP: Non-Plastic

SUMMARY OF USCS TESTS

Project No.: 2012.3351.01
Project Name: SR 4 (US 1) Over Altamaha River, Bridge 1

Contract No.: BR000-0001-00(216)
P.I. NO. 0001216
Counties: Appling/ Toombs

Lab. No.	25	26	27	28
Sample No.	13	14	15	16
Station	55+25 18' Right	55+25 18' Right	56+10 28' Right	56+10 28' Right
Location	Bent 7 10' Left	Bent 7 10' Left	Bent 8 Centerline	Bent 8 Centerline
Depth (ft)	33.5-35	48.5-50	28.5-30	63.5-65
PHYSICAL TESTS				
2-1/2" Sieve	100	100	100	100
1-1/2" Sieve	100	100	100	100
#10 Sieve	99.0	98.0	100	99.8
#40 Sieve	91.9	85.6	97.2	93.9
#60 Sieve	90.1	54.3	89.2	72.4
#200 Sieve	54.0	7.9	34.6	13.5
Liquid Lmt. (%)	104	NP	39	NP
Plast. Index (%)	70	NP	18	NP
Moisture (%)	90.4	28.9	23.3	39.5
Organics (%)	-	-	-	-
Unified Soil Classification	CH	SP-SM	SC	SM
TESTING DATES				
Date Sampled	06/20/2012	06/20/2012	06/21/2012	06/21/2012
Date Completed	07/27/2012	07/27/2012	07/27/2012	07/27/2012
Date Received	06/22/2012	06/22/2012	06/22/2012	06/22/2012

Remarks: _____

Respectfully Submitted: _____

NP: Non-Plastic

SUMMARY OF USCS TESTS

Project No.: 2012.3351.01
Project Name: SR 4 (US 1) Over Altamaha River, Bridge 1

Contract No.: BR000-0001-00(216)
P.I. NO. 0001216
Counties: Appling/ Toombs

Lab. No.	29	30	31	32
Sample No.	17	18	19	20
Station	56+95 28' Right	56+95 28' Right	57+80 28' Right	57+80 28' Right
Location	Bent 9 Centerline	Bent 9 Centerline	Bent 10 Centerline	Bent 10 Centerline
Depth (ft)	4-6	38.5-40	8-10	28.5-30
PHYSICAL TESTS				
2-1/2" Sieve	100	100	100	100
1-1/2" Sieve	100	100	100	100
#10 Sieve	100	93.3	93.6	98.9
#40 Sieve	100	79.9	38.7	96.9
#60 Sieve	97.1	64.9	15.0	89.6
#200 Sieve	20.3	30.4	4.3	35.5
Liquid Lmt. (%)	NP	42	NP	39
Plast. Index (%)	NP	25	NP	26
Moisture (%)	8.4	27.2	5.3	28.8
Organics (%)	-	-	-	-
Unified Soil Classification	SM	SC	SP	SC
TESTING DATES				
Date Sampled	06/20/2012	06/20/2012	06/20/2012	06/20/2012
Date Completed	07/27/2012	07/27/2012	07/27/2012	07/27/2012
Date Received	06/22/2012	06/22/2012	06/22/2012	06/22/2012

Remarks: _____

Respectfully Submitted: _____

NP: Non-Plastic

SUMMARY OF USCS TESTS

Project No.: 2012.3351.01
Project Name: SR 4 (US 1) Over Altamaha River, Bridge 1

Contract No.: BR000-0001-00(216)
P.I. NO. 0001216
Counties: Appling/ Toombs

Lab. No.	33	34	35	36
Sample No.	21	22	23	24
Station	58+65 28' Right	58+65 28' Right	59+50 28' Right	59+50 28' Right
Location	Bent 11 Centerline	Bent 11 Centerline	Bent 12 Centerline	Bent 12 Centerline
Depth (ft)	13.5-15	53.5-55	6-8	33.5-35
PHYSICAL TESTS				
2-1/2" Sieve	100	100	100	100
1-1/2" Sieve	100	100	100	100
#10 Sieve	68.4	91.0	100	80.1
#40 Sieve	32.0	77.6	99.2	68.9
#60 Sieve	12.9	52.9	98.6	63.0
#200 Sieve	4.2	8.2	90.0	12.3
Liquid Lmt. (%)	NP	NP	63	NP
Plast. Index (%)	NP	NP	41	NP
Moisture (%)	17.4	32.9	36.8	28.3
Organics (%)	-	-	-	-
Unified Soil Classification	SP	SP-SM	CH	SM
TESTING DATES				
Date Sampled	06/20/2012	06/20/2012	06/20/2012	06/20/2012
Date Completed	07/27/2012	07/27/2012	07/27/2012	07/27/2012
Date Received	06/22/2012	06/22/2012	06/22/2012	06/22/2012

Remarks: _____

Respectfully Submitted: _____

NP: Non-Plastic

SUMMARY OF USCS TESTS

Project No.: 2012.3351.01
Project Name: SR 4 (US 1) Over Altamaha River, Bridge 1

Contract No.: BR000-0001-00(216)
P.I. NO. 0001216
Counties: Appling/ Toombs

Lab. No.	37	38	39	40
Sample No.	25	26	27	28
Station	60+35 28' Right	60+35 28' Right	61+20 38' Right	61+20 38' Right
Location	Bent 13 Centerline	Bent 13 Centerline	Bent 14 10' Right	Bent 14 10' Right
Depth (ft)	8-10	43.5-45	18.5-20	48.5-50
PHYSICAL TESTS				
2-1/2" Sieve	100	100	100	100
1-1/2" Sieve	100	100	100	100
#10 Sieve	97.8	99.6	82.8	99.6
#40 Sieve	40.8	88.5	27.8	95.9
#60 Sieve	16.4	65.7	10.0	45.6
#200 Sieve	7.7	14.5	3.5	10.0
Liquid Lmt. (%)	NP	NP	NP	NP
Plast. Index (%)	NP	NP	NP	NP
Moisture (%)	16.1	35.8	16.3	27.6
Organics (%)	-	-	-	-
Unified Soil Classification	SP-SM	SM	SP	SP-SM
TESTING DATES				
Date Sampled	06/20/2012	06/20/2012	06/19/2012	06/19/2012
Date Completed	07/27/2012	07/27/2012	07/27/2012	07/27/2012
Date Received	06/22/2012	06/22/2012	06/22/2012	06/22/2012

Remarks: _____

Respectfully Submitted: _____

NP: Non-Plastic

SUMMARY OF USCS TESTS

Project No.: 2012.3351.01
Project Name: SR 4 (US 1) Over Altamaha River, Bridge 1

Contract No.: BR000-0001-00(216)
P.I. NO. 0001216
Counties: Appling/ Toombs

Lab. No.	41	42	43	44
Sample No.	29	30	31	32
Station	62+40 38' Right	62+40 38' Right	63+60 28' Right	63+60 28' Right
Location	Bent 16 10' Right	Bent 16 10' Right	Bent 18 Centerline	Bent 18 Centerline
Depth (ft)	6-8	28.5-30	2-4	38.5-40
PHYSICAL TESTS				
2-1/2" Sieve	100	100	100	100
1-1/2" Sieve	100	100	100	100
#10 Sieve	100	100	99.8	99.6
#40 Sieve	99.4	90.4	89.1	79.7
#60 Sieve	99.1	60.3	79.5	51.7
#200 Sieve	98.0	12.1	63.0	14.6
Liquid Lmt. (%)	76	NP	49	NP
Plast. Index (%)	50	NP	32	NP
Moisture (%)	37.3	38.0	24.4	33.2
Organics (%)	-	-	-	-
Unified Soil Classification	CH	SM	CL	SM
TESTING DATES				
Date Sampled	06/19/2012	06/19/2012	06/19/2012	06/19/2012
Date Completed	07/27/2012	07/27/2012	07/27/2012	07/27/2012
Date Received	06/22/2012	06/22/2012	06/22/2012	06/22/2012

Remarks: _____

Respectfully Submitted: _____

NP: Non-Plastic

SUMMARY OF USCS TESTS

Project No.: 2012.3351.01
Project Name: SR 4 (US 1) Over Altamaha River, Bridge 1

Contract No.: BR000-0001-00(216)
P.I. NO. 0001216
Counties: Appling/ Toombs

Lab. No.	45	46	47	47
Sample No.	33	34	35	36
Station	64+80 25' Right	64+80 25' Right	66+00 18' Right	66+00 18' Right
Location	Bent 20 3' Left	Bent 20 3' Left	Bent 22 10' Left	Bent 22 10' Left
Depth (ft)	4-6	43.5-45	8-10	48.5-50
PHYSICAL TESTS				
2-1/2" Sieve	100	100	100	100
1-1/2" Sieve	100	100	100	100
#10 Sieve	99.9	95.8	99.5	99.2
#40 Sieve	99.6	77.1	54.7	87.0
#60 Sieve	99.2	48.6	24.9	51.3
#200 Sieve	98.5	11.4	9.5	9.3
Liquid Lmt. (%)	68	NP	NP	NP
Plast. Index (%)	43	NP	NP	NP
Moisture (%)	30.6	35.9	16.6	30.1
Organics (%)	-	-	-	-
Unified Soil Classification	CH	SP-SM	SP-SM	SP-SM
TESTING DATES				
Date Sampled	06/19/2012	06/19/2012	06/19/2012	06/19/2012
Date Completed	07/27/2012	07/27/2012	07/27/2012	07/27/2012
Date Received	06/22/2012	06/22/2012	06/22/2012	06/22/2012

Remarks: _____

Respectfully Submitted: _____

NP: Non-Plastic

SUMMARY OF USCS TESTS

Project No.: 2012.3351.01
Project Name: SR 4 (US 1) Over Altamaha River, Bridge 1

Contract No.: BR000-0001-00(216)
P.I. NO. 0001216
Counties: Appling/ Toombs

Lab. No.	49	50	51	52
Sample No.	37	38	39	40
Station	67+20 28' Right	67+20 28' Right	68+40 28' Right	68+40 28' Right
Location	Bent 24 Centerline	Bent 24 Centerline	Bent 26 Centerline	Bent 26 Centerline
Depth (ft)	13.5-15	33.5-35	23.5-25	48.5-50
PHYSICAL TESTS				
2-1/2" Sieve	100	100	100	100
1-1/2" Sieve	100	100	100	100
#10 Sieve	98.2	99.0	89.1	98.8
#40 Sieve	73.9	89.1	16.2	70.2
#60 Sieve	47.7	72.4	8.6	39.8
#200 Sieve	5.3	11.7	4.6	3.2
Liquid Lmt. (%)	NP	52	NP	NP
Plast. Index (%)	NP	31	NP	NP
Moisture (%)	25.3	37.9	16.4	27.9
Organics (%)	-	-	-	-
Unified Soil Classification	SP-SM	SP-SC	SP	SP
TESTING DATES				
Date Sampled	06/19/2012	06/19/2012	06/19/2012	06/19/2012
Date Completed	07/27/2012	07/27/2012	07/27/2012	07/27/2012
Date Received	06/22/2012	06/22/2012	06/22/2012	06/22/2012

Remarks: _____

Respectfully Submitted: _____

NP: Non-Plastic

SUMMARY OF USCS TESTS

Project No.: 2012.3351.01
Project Name: SR 4 (US 1) Over Altamaha River, Bridge 1

Contract No.: BR000-0001-00(216)
P.I. NO. 0001216
Counties: Appling/ Toombs

Lab. No.	53	54	55	56
Sample No.	41	42	43	44
Station	69+60 28' Right	69+60 28' Right	70+80 28' Right	70+80 28' Right
Location	Bent 28 Centerline	Bent 28 Centerline	Bent 30 Centerline	Bent 30 Centerline
Depth (ft)	8-10	33.5-35	28.5-30	48.5-50
PHYSICAL TESTS				
2-1/2" Sieve	100	100	100	100
1-1/2" Sieve	100	100	100	100
#10 Sieve	96.8	91.4	84.2	100
#40 Sieve	79.5	75.6	47.1	89.6
#60 Sieve	69.0	59.4	30.2	57.0
#200 Sieve	26.6	18.1	4.7	8.2
Liquid Lmt. (%)	30	45	NP	NP
Plast. Index (%)	17	30	NP	NP
Moisture (%)	34.9	31.6	19.1	29.1
Organics (%)	-	-	-	-
Unified Soil Classification	SC	SC	SP	SP-SM
TESTING DATES				
Date Sampled	06/14/2012	06/14/2012	06/18/2012	06/18/2012
Date Completed	07/27/2012	07/27/2012	07/27/2012	07/27/2012
Date Received	06/22/2012	06/22/2012	06/22/2012	06/22/2012

Remarks: _____

Respectfully Submitted: _____

NP: Non-Plastic

SUMMARY OF USCS TESTS

Project No.: 2012.3351.01
Project Name: SR 4 (US 1) Over Altamaha River, Bridge 1

Contract No.: BR000-0001-00(216)
P.I. NO. 0001216
Counties: Appling/ Toombs

Lab. No.	1	2	3	4
Sample No.	45	46	47	48
Station	72+00 28' Right	72+00 28' Right	73+20 28' Right	73+20 28' Right
Location	Bent 32 Centerline	Bent 32 Centerline	Bent 34 Centerline	Bent 34 Centerline
Depth (ft)	4-6	38.5-40	13.5-15	48.5-50
PHYSICAL TESTS				
2-1/2" Sieve	100	100	100	100
1-1/2" Sieve	100	100	100	100
#10 Sieve	100	99.2	87.5	99.8
#40 Sieve	99.6	84.5	37.7	83.1
#60 Sieve	90.5	55.1	12.4	47.0
#200 Sieve	24.4	12.0	3.7	9.8
Liquid Lmt. (%)	NP	NP	NP	NP
Plast. Index (%)	NP	NP	NP	NP
Moisture (%)	11.8	33.0	19.5	25.7
Organics (%)	-	-	-	-
Unified Soil Classification	SM	SP-SM	SP	SP-SM
TESTING DATES				
Date Sampled	06/15/2012	06/15/2012	06/14/2012	06/14/2012
Date Completed	07/27/2012	07/27/2012	07/27/2012	07/27/2012
Date Received	06/15/2012	06/15/2012	06/15/2012	06/15/2012

Remarks: _____

Respectfully Submitted: _____

NP: Non-Plastic

SUMMARY OF USCS TESTS

Project No.: 2012.3351.01
Project Name: SR 4 (US 1) Over Altamaha River, Bridge 1

Contract No.: BR000-0001-00(216)
P.I. NO. 0001216
Counties: Appling/ Toombs

Lab. No.	69	70	57	58
Sample No.	49	50	51	52
Station	74+40 28' Right	74+40 28' Right	75+60 28' Right	75+60 28' Right
Location	Bent 36 Centerline	Bent 36 Centerline	Bent 38 Centerline	Bent 38 Centerline
Depth (ft)	2-4	43.5-45	4-6	33.5-35
PHYSICAL TESTS				
2-1/2" Sieve	100	100	100	100
1-1/2" Sieve	100	100	100	100
#10 Sieve	99.0	99.9	99.3	99.7
#40 Sieve	54.3	81.3	52.1	88.7
#60 Sieve	24.4	42.7	30.6	56.1
#200 Sieve	16.3	9.9	15.4	7.9
Liquid Lmt. (%)	NP	NP	31	38
Plast. Index (%)	NP	NP	19	15
Moisture (%)	15.3	27.1	15.2	29.6
Organics (%)	-	-	-	-
Unified Soil Classification	SM	SP-SM	SC	SP-SC
TESTING DATES				
Date Sampled	06/25/2012	06/25/2012	06/21/2012	06/21/2012
Date Completed	07/27/2012	07/27/2012	07/27/2012	07/27/2012
Date Received	07/12/2012	07/12/2012	06/22/2012	06/22/2012

Remarks: _____

Respectfully Submitted: _____

NP: Non-Plastic

SUMMARY OF USCS TESTS

Project No.: 2012.3351.01
Project Name: SR 4 (US 1) Over Altamaha River, Bridge 1

Contract No.: BR000-0001-00(216)
P.I. NO. 0001216
Counties: Appling/ Toombs

Lab. No.	5	6	7	8
Sample No.	53	54	55	56
Station	76+80 28' Right	76+80 28' Right	78+00 28' Right	78+00 28' Right
Location	Bent 40 Centerline	Bent 40 Centerline	Bent 42 Centerline	Bent 42 Centerline
Depth (ft)	6-8	43.5-45	28.5-30	63.5-65
PHYSICAL TESTS				
2-1/2" Sieve	100	100	100	100
1-1/2" Sieve	100	100	100	100
#10 Sieve	100	100	97.2	99.9
#40 Sieve	64.8	80.7	44.7	96.4
#60 Sieve	29.8	43.4	16.4	84.7
#200 Sieve	7.3	9.9	5.7	31.0
Liquid Lmt. (%)	NP	NP	NP	NP
Plast. Index (%)	NP	NP	NP	NP
Moisture (%)	20.2	28.4	19.3	42.0
Organics (%)	-	-	-	-
Unified Soil Classification	SP-SM	SP-SM	SP-SM	SM
TESTING DATES				
Date Sampled	06/14/2012	06/14/2012	06/14/2012	06/14/2012
Date Completed	07/27/2012	07/27/2012	07/27/2012	07/27/2012
Date Received	06/15/2012	06/15/2012	06/15/2012	06/15/2012

Remarks: _____

Respectfully Submitted: _____

NP: Non-Plastic

SUMMARY OF USCS TESTS

Project No.: 2012.3351.01
Project Name: SR 4 (US 1) Over Altamaha River, Bridge 1

Contract No.: BR000-0001-00(216)
P.I. NO. 0001216
Counties: Appling/ Toombs

Lab. No.	9	10	11	12
Sample No.	57	58	59	60
Station	79+20 28'Right	79+20 28'Right	80+40 8' Right	80+40 8' Right
Location	Bent 44 Centerline	Bent 44 Centerline	Bent 46 20' Left	Bent 46 20' Left
Depth (ft)	18.5-20	53.5-55	6-8	38.5-40
PHYSICAL TESTS				
2-1/2" Sieve	100	100	100	100
1-1/2" Sieve	100	100	100	100
#10 Sieve	89.2	100	99.9	97.8
#40 Sieve	25.1	82.0	80.4	83.8
#60 Sieve	9.8	38.6	29.3	55.9
#200 Sieve	3.1	9.9	4.6	28.2
Liquid Lmt. (%)	NP	NP	NP	38
Plast. Index (%)	NP	NP	NP	21
Moisture (%)	20.5	26.6	13.6	32.6
Organics (%)	-	-	-	-
Unified Soil Classification	SP	SP-SM	SP	SC
TESTING DATES				
Date Sampled	06/14/2012	06/14/2012	06/14/2012	06/14/2012
Date Completed	07/27/2012	07/27/2012	07/27/2012	07/27/2012
Date Received	06/15/2012	06/15/2012	06/15/2012	06/15/2012

Remarks: _____

Respectfully Submitted: _____

NP: Non-Plastic

SUMMARY OF USCS TESTS

Project No.: 2012.3351.01
Project Name: SR 4 (US 1) Over Altamaha River, Bridge 1

Contract No.: BR000-0001-00(216)
P.I. NO. 0001216
Counties: Appling/ Toombs

Lab. No.	13	14	15	16
Sample No.	61	62	63	64
Station	81+60 28' Right	81+60 28' Right	82+80 23' Right	82+80 23' Right
Location	Bent 48 Centerline	Bent 48 Centerline	Bent 50 5' Left	Bent 50 5' Left
Depth (ft)	23.5-25	48.5-50	38.5-40	63.5-65
PHYSICAL TESTS				
2-1/2" Sieve	100	100	100	100
1-1/2" Sieve	100	100	100	100
#10 Sieve	93.0	99.5	99.8	99.7
#40 Sieve	37.1	71.9	48.8	84.8
#60 Sieve	12.9	35.6	29.9	69.2
#200 Sieve	3.0	8.8	11.0	12.3
Liquid Lmt. (%)	NP	NP	NP	NP
Plast. Index (%)	NP	NP	NP	NP
Moisture (%)	19.5	35.6	33.0	34.4
Organics (%)	-	-	-	-
Unified Soil Classification	SP	SP-SM	SP-SM	SM
TESTING DATES				
Date Sampled	06/19/2012	06/19/2012	06/13/2012	06/13/2012
Date Completed	07/27/2012	07/27/2012	07/27/2012	07/27/2012
Date Received	06/15/2012	06/15/2012	06/15/2012	06/15/2012

Remarks: _____

Respectfully Submitted: _____

NP: Non-Plastic

SUMMARY OF USCS TESTS

Project No.: 2012.3351.01
Project Name: SR 4 (US 1) Over Altamaha River, Bridge 1

Contract No.: BR000-0001-00(216)
P.I. NO. 0001216
Counties: Appling/ Toombs

Lab. No.	17	18	19	20
Sample No.	65	66	67	68
Station	84+00 28' Right	84+00 28' Right	85+20 18' Right	85+20 18' Right
Location	Bent 52 Centerline	Bent 52 Centerline	Bent 54 10' Left	Bent 54 10' Left
Depth (ft)	13.5-15	53.5-55	8.5-10	33.5-35
PHYSICAL TESTS				
2-1/2" Sieve	100	100	100	100
1-1/2" Sieve	100	100	100	100
#10 Sieve	96.9	99.5	98.3	96.2
#40 Sieve	54.6	79.7	61.0	82.7
#60 Sieve	18.0	39.7	20.7	50.6
#200 Sieve	3.5	8.5	4.3	24.9
Liquid Lmt. (%)	NP	NP	NP	44
Plast. Index (%)	NP	NP	NP	27
Moisture (%)	21.6	27.9	19.3	45.6
Organics (%)	-	-	-	-
Unified Soil Classification	SP	SP-SM	SP	SC
TESTING DATES				
Date Sampled	06/13/2012	06/13/2012	06/13/2012	06/13/2012
Date Completed	07/27/2012	07/27/2012	07/27/2012	07/27/2012
Date Received	06/15/2012	06/15/2012	06/15/2012	06/15/2012

Remarks: _____

Respectfully Submitted: _____

NP: Non-Plastic

SUMMARY OF USCS TESTS

Project No.: 2012.3351.01
Project Name: SR 4 (US 1) Over Altamaha River, Bridge 1

Contract No.: BR000-0001-00(216)
P.I. NO. 0001216
Counties: Appling/ Toombs

Lab. No.	21	22	71	72
Sample No.	69	70	71	72
Station	86+45 18' Right	86+45 18' Right	87+60 28' Right	87+60 28' Right
Location	Bent 56 10' Left	Bent 56 10' Left	Bent 58 Centerline	Bent 58 Centerline
Depth (ft)	4-6	28.5-30	8-10	38.5-40
PHYSICAL TESTS				
2-1/2" Sieve	100	100	100	100
1-1/2" Sieve	100	100	100	100
#10 Sieve	99.6	92.4	100	95.1
#40 Sieve	76.6	61.7	92.3	48.2
#60 Sieve	46.5	51.3	44.6	17.7
#200 Sieve	23.5	21.1	10.2	3.3
Liquid Lmt. (%)	22	NP	NP	NP
Plast. Index (%)	12	NP	NP	NP
Moisture (%)	15.0	23.2	21.2	21.1
Organics (%)	-	-	-	-
Unified Soil Classification	SC	SM	SP-SM	SP
TESTING DATES				
Date Sampled	06/12/2012	06/12/2012	06/25/2012	06/25/2012
Date Completed	07/27/2012	07/27/2012	07/27/2012	07/27/2012
Date Received	06/15/2012	06/15/2012	07/12/2012	07/12/2012

Remarks: _____

Respectfully Submitted: _____

NP: Non-Plastic

SUMMARY OF USCS TESTS

Project No.: 2012.3351.01
Project Name: SR 4 (US 1) Over Altamaha River, Bridge 1

Contract No.: BR000-0001-00(216)
P.I. NO. 0001216
Counties: Appling/ Toombs

Lab. No.	73	74	75	76
Sample No.	73	74	75	76
Station	88+20 58' Right	88+20 58' Right	48+80 22' Left	50+20 22' Left
Location	Bent 59 30' Right	Bent 59 30' Right	Bent 2 50' Left	Bent 3 50' Left
Depth (ft)	18.5-20	48.5-50	75-77	80-82
PHYSICAL TESTS				
2-1/2" Sieve	100	100	100	100
1-1/2" Sieve	100	100	100	100
#10 Sieve	98.6	98.5	99.8	99.9
#40 Sieve	60.9	84.5	98.2	99.6
#60 Sieve	24.4	56.3	90.6	99.2
#200 Sieve	5.8	15.6	26.0	84.8
Liquid Lmt. (%)	NP	39	46	141
Plast. Index (%)	NP	23	24	86
Moisture (%)	18.4	22.9	48.3	99.8
Organics (%)	-	-	-	-
Unified Soil Classification	SP-SM	SC	SC	MH
TESTING DATES				
Date Sampled	06/29/2012	06/29/2012	06/28/2012	06/27/2012
Date Completed	07/27/2012	07/27/2012	08/27/2012	08/27/2012
Date Received	07/12/2012	07/12/2012	08/20/2012	08/20/2012

Remarks: _____

Respectfully Submitted: _____

NP: Non-Plastic

SUMMARY OF USCS TESTS

Project No.: 2012.3351.01
Project Name: SR 4 (US 1) Over Altamaha River, Bridge 1

Contract No.: BR000-0001-00(216)
P.I. NO. 0001216
Counties: Appling/ Toombs

Lab. No.	77	78	79	80
Sample No.	77	78	79	80
Station	48+80 3' Right	48+80 3' Right	48+80 3' Right	58+65 25' Right
Location	Bent 2 25' Left	Bent 2 25' Left	Bent 2 25' Left	Bent 11 3' Left
Depth (ft)	83.5-85	148.5-150	178.5-180	83.5-85
PHYSICAL TESTS				
2-1/2" Sieve	100	100	100	100
1-1/2" Sieve	100	100	100	100
#10 Sieve	77.2	100	99.9	100
#40 Sieve	75.4	99.3	97.7	95.1
#60 Sieve	72.2	98.8	95.9	91.4
#200 Sieve	26.8	77.7	50.1	75.0
Liquid Lmt. (%)	58	93	86	54
Plast. Index (%)	25	39	37	23
Moisture (%)	36.4	44.3	46.9	31.7
Organics (%)	-	-	-	-
Unified Soil Classification	SM	MH	MH	MH
TESTING DATES				
Date Sampled	04/27/2013	04/27/2013	04/27/2013	04/09/2013
Date Completed	05/08/2013	05/08/2013	05/08/2013	05/08/2013
Date Received	05/01/2013	05/01/2013	05/01/2013	05/01/2013

Remarks: _____

Respectfully Submitted: _____

SUMMARY OF USCS TESTS

Project No.: 2012.3351.01
Project Name: SR 4 (US 1) Over Altamaha River, Bridge 1

Contract No.: BR000-0001-00(216)
P.I. NO. 0001216
Counties: Appling/ Toombs

Lab. No.	81	82	-	-
Sample No.	81	82	-	-
Station	58+65 25' Right	58+65 25' Right	-	-
Location	Bent 11 3' Left	Bent 11 3' Left	-	-
Depth (ft)	113.5-115	128.5-130	-	-
PHYSICAL TESTS				
2-1/2" Sieve	100	100	100	100
1-1/2" Sieve	100	100	100	100
#10 Sieve	99.8	100	-	-
#40 Sieve	98.8	99.6	-	-
#60 Sieve	98.0	89.5	-	-
#200 Sieve	26.5	55.1	-	-
Liquid Lmt. (%)	NP	80	-	-
Plast. Index (%)	NP	53	-	-
Moisture (%)	40.8	48.3	-	-
Organics (%)	-	-	-	-
Unified Soil Classification	SM	CH	-	-
TESTING DATES				
Date Sampled	04/09/2013	04/09/2013	-	-
Date Completed	05/08/2013	05/08/2013	-	-
Date Received	05/01/2013	05/01/2013	-	-

Remarks: _____

Respectfully Submitted: _____

NP: Non-Plastic

FIELD EXPLORATION PROCEDURES

SPT Borings

Thirty nine (39) SPT borings, designated Bents 1, 2 and 2L, Bents 3 through 10, Bents 11, 11L, 12, 13, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58 and 59 were drilled along/near proposed bridge bents. The depths of borings ranged from 60 to 173 feet below the existing grades or river bed. The approximate locations of the borings are shown on the attached Subsurface Plan & Profile (Figure 2B thru 2G) provided in Appendix of this report.

Boring locations were established in the field by the Project Engineer using a measuring tape and hand held compass based on the provided Benchmark Location and existing site features.
The drilling and sampling were performed in general accordance with ASTM Standard D-1586. Soil samples obtained were observed by a Geotechnical Engineer and classified according to the visual manual procedures (ASTM D-2488-00). A narrative of field operations is also included in The Appendix.

LABORATORY TESTING PROCEDURES

Moisture Content

The moisture content was determined for selected soil samples obtained in the split-barrel sampler. A representative portion of each sample was weighed and then placed in an oven and dried at 110 degrees Centigrade for at least 15 to 16 hours. After removal from the oven, the soil was again weighed. The weight of the moisture lost during drying thus was determined. From this data, the moisture content of the sample was then calculated as the weight of moisture divided by dry weight of soil, expressed as a percentage. This test was conducted according to ASTM D 2216.

Moisture content is a useful index of a soil's compressibility. If the soil is to be used as fill, the moisture content may be compared to the range of water contents for which proper compaction may be achieved. These moisture contents may be found at the appropriate depths on the respective Boring Logs and are denoted by "w".

Unified Soil Classification System (USCS)

Soils to be classified as per Unified Soil classification System (USCS) are generally required to perform grain size analysis (particle size distribution), liquid limit and plasticity index tests when precise classification is required. After performing the required tests, the classification is generally performed in accordance with ASTM D 2487. These classification tests are also required by GDOT in the areas of construction of new pavement over existing paved shoulders, areas of muck, swamp, lake/pond bottom, etc.

Grain Size (Sieve) Analysis with or without Hydrometer

Grain Size Analysis tests were performed to determine the particle size distribution of selected samples tested. The grain size distribution of soils coarser than a number 200 sieve was determined by passing the samples through a standard set of nested sieves. Materials finer than the number 200 sieves were suspended in water and the grain size distribution computed from the time rate of settlement of the different size particles. Air-dried soil passed through #200 sieve. 50 grams of that must soak in s/c agent for a minimum of 8 hours. Soil is then put in graduated cylinder with a hydrometer. Readings are taken at specified times. A graph is drawn from data. These tests were similar to those described by ASTM D 421 and D 422. The data obtained are summarized on the enclosed Summary of USCS Test Data.

Liquid and Plastic Limits (Atterberg Limits)

Liquid Limit and Plastic Limit tests aid in the classification of the soils and provide an indication of the soil behavior with moisture change. The Plasticity Index is calculated by subtracting the Plastic Limit (PL) from the Liquid Limit (LL). The Liquid Limit is the moisture content at which the soil will flow as a heavy viscous fluid and is the upper limit of the plastic range, as determined in accordance with ASTM D 4318. The Plastic Limit is the moisture content at which the soil begins to lose its plasticity, as determined in accordance with ASTM D 4318. The Liquidity Index is the ratio of the difference between the in-place moisture and the plastic limit to the Plasticity Limit. The data obtained are summarized on the enclosed Summary of USCS Test Data.

Looking in increasing station from existing bridge centerline at station 47+40

Looking in decreasing station from existing bridge centerline at station 88+20

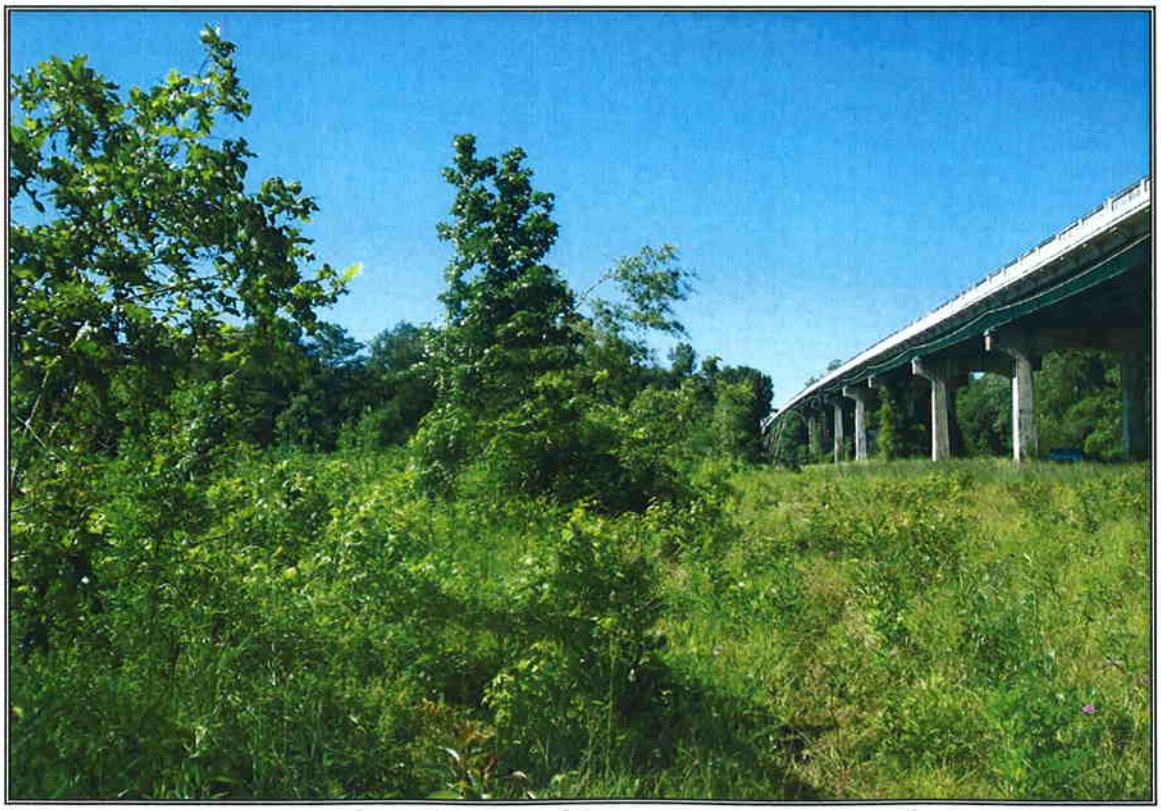
Looking in decreasing station from existing bridge centerline at station 51+60

Looking in increasing station from existing bridge centerline at station 51+60

Looking in decreasing station from proposed Bent 5 Centerline

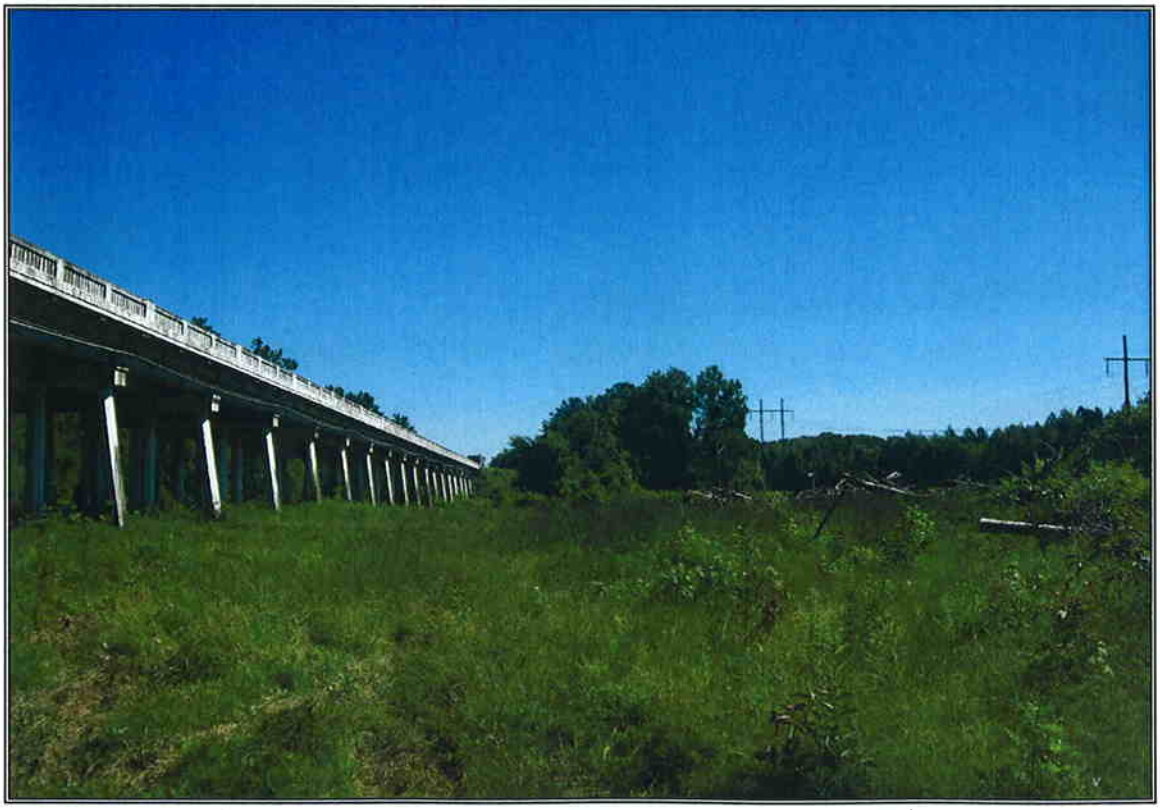
Looking in increasing station from proposed Bent 5 Centerline

Looking at existing bridge from proposed Bent 8 Centerline



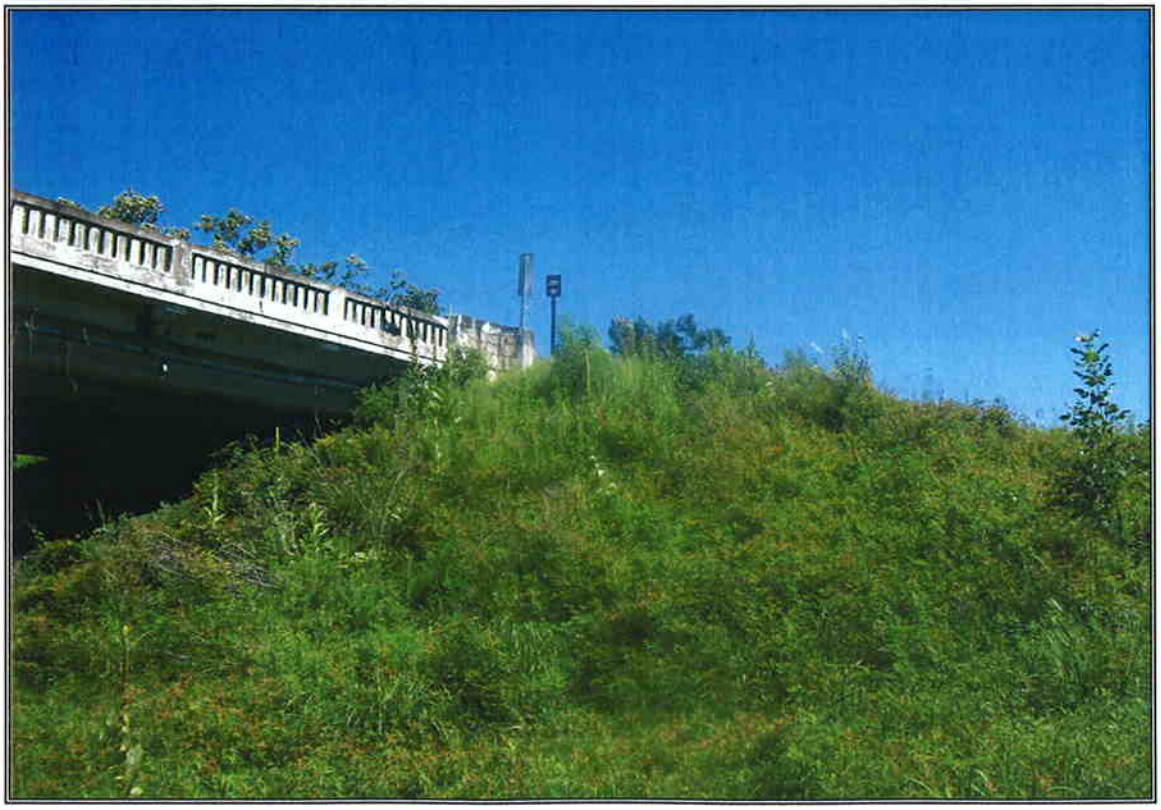
Looking in decreasing station from proposed Bent 13 Centerline

Looking in increasing station from proposed Bent 13 Centerline



Looking in increasing station from proposed Bent 48 Centerline

Looking in decreasing station from proposed Bent 58 Centerline



Looking at existing bridge end bent from proposed Bent 58 Centerline

DRIVEN 1.0

GENERAL PROJECT INFORMATION

Filename: C:\DOCUME~1\AWIJAYA\DESKTOP\DRIVEN\ALTAMA~1\BENT1~1.DVN
Project Name: Altamaha River - BENT 1 Project Date: 06/29/2012
Project Client: Heath Lineback
Computed By: SRF
Project Manager: SS

PILE INFORMATION

Pile Type: Concrete Pile
Top of Pile: 5.00 ft
Length of Square Side: 24.00 in

ULTIMATE CONSIDERATIONS

Water Table Depth At Time Of:	- Drilling:	23.00 ft
	- Driving/Restrike	0.00 ft
	- Ultimate:	20.00 ft
Ultimate Considerations:	- Local Scour:	0.00 ft
	- Long Term Scour:	0.00 ft
	- Soft Soil:	0.00 ft

ULTIMATE PROFILE

Layer	Type	Thickness	Driving Loss	Unit Weight	Strength	Ultimate Curve
1	Cohesionless	6.00 ft	0.00%	110.00 pcf	30.2/30.1	Nordlund
2	Cohesive	2.00 ft	0.00%	120.00 pcf	0.00 psf	User Def.
3	Cohesive	5.00 ft	0.00%	120.00 pcf	0.00 psf	User Def.
4	Cohesive	5.00 ft	0.00%	120.00 pcf	0.00 psf	User Def.
5	Cohesive	5.00 ft	0.00%	130.00 pcf	0.00 psf	User Def.
6	Cohesionless	20.00 ft	0.00%	130.00 pcf	36.0/36.0	Nordlund
7	Cohesionless	5.00 ft	0.00%	120.00 pcf	31.5/31.5	Nordlund
8	Cohesionless	5.00 ft	0.00%	130.00 pcf	35.6/35.6	Nordlund
9	Cohesionless	7.00 ft	0.00%	120.00 pcf	31.2/31.2	Nordlund

RESTRIKE - SKIN FRICTION

Depth	Soil Type	Effective Stress At Midpoint	Sliding Friction Angle	Adhesion	Skin Friction
0.01 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
4.99 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
5.00 ft	Cohesionless	238.00 psf	27.58	N/A	0.00 Kips
5.99 ft	Cohesionless	261.56 psf	27.58	N/A	1.27 Kips
6.01 ft	Cohesive	N/A	N/A	1000.00 psf	1.36 Kips
7.99 ft	Cohesive	N/A	N/A	1000.00 psf	17.20 Kips
8.01 ft	Cohesive	N/A	N/A	1300.00 psf	17.39 Kips
12.99 ft	Cohesive	N/A	N/A	1300.00 psf	69.18 Kips
13.01 ft	Cohesive	N/A	N/A	1038.00 psf	69.36 Kips
17.99 ft	Cohesive	N/A	N/A	1038.00 psf	110.72 Kips
18.01 ft	Cohesive	N/A	N/A	1300.00 psf	110.91 Kips
22.99 ft	Cohesive	N/A	N/A	1300.00 psf	162.70 Kips
23.01 ft	Cohesionless	1315.14 psf	32.90	N/A	162.94 Kips
32.01 ft	Cohesionless	1619.34 psf	32.90	N/A	311.86 Kips
41.01 ft	Cohesionless	1923.54 psf	32.90	N/A	516.73 Kips
42.99 ft	Cohesionless	1990.46 psf	32.90	N/A	569.31 Kips
43.01 ft	Cohesionless	2667.09 psf	28.83	N/A	569.74 Kips
47.99 ft	Cohesionless	2810.51 psf	28.83	N/A	652.10 Kips
48.01 ft	Cohesionless	2955.14 psf	32.57	N/A	652.56 Kips
52.99 ft	Cohesionless	3123.46 psf	32.57	N/A	802.20 Kips
53.01 ft	Cohesionless	3293.09 psf	28.53	N/A	802.70 Kips
59.99 ft	Cohesionless	3494.11 psf	28.53	N/A	940.28 Kips

RESTRIKE - END BEARING

Depth	Soil Type	Effective Stress At Tip	Bearing Cap. Factor	Limiting End Bearing	End Bearing
0.01 ft	Cohesionless	0.00 psf	30.68	57.10 Kips	0.00 Kips
4.99 ft	Cohesionless	0.00 psf	30.68	57.10 Kips	0.00 Kips
5.00 ft	Cohesionless	238.00 psf	30.68	57.10 Kips	17.02 Kips
5.99 ft	Cohesionless	285.12 psf	30.68	57.10 Kips	20.40 Kips
6.01 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
7.99 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
8.01 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
12.99 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
13.01 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
17.99 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
18.01 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
22.99 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
23.01 ft	Cohesionless	1315.48 psf	77.60	606.40 Kips	283.10 Kips
32.01 ft	Cohesionless	1923.88 psf	77.60	606.40 Kips	414.04 Kips
41.01 ft	Cohesionless	2532.28 psf	77.60	606.40 Kips	544.84 Kips
42.99 ft	Cohesionless	2666.12 psf	77.60	606.40 Kips	573.37 Kips
43.01 ft	Cohesionless	2667.38 psf	38.01	106.24 Kips	106.24 Kips
47.99 ft	Cohesionless	2954.22 psf	38.01	106.24 Kips	106.24 Kips
48.01 ft	Cohesionless	2955.48 psf	72.57	541.28 Kips	541.28 Kips
52.99 ft	Cohesionless	3292.12 psf	72.57	541.28 Kips	541.28 Kips
53.01 ft	Cohesionless	3293.38 psf	36.29	88.82 Kips	88.82 Kips
59.99 ft	Cohesionless	3695.42 psf	36.29	88.82 Kips	88.82 Kips

RESTRIKE - SUMMARY OF CAPACITIES

Depth	Skin Friction	End Bearing	Total Capacity
0.01 ft	0.00 Kips	0.00 Kips	0.00 Kips
4.99 ft	0.00 Kips	0.00 Kips	0.00 Kips
5.00 ft	0.00 Kips	17.02 Kips	17.02 Kips
5.99 ft	1.27 Kips	20.40 Kips	21.66 Kips
6.01 ft	1.36 Kips	0.00 Kips	1.36 Kips
7.99 ft	17.20 Kips	0.00 Kips	17.20 Kips
8.01 ft	17.39 Kips	0.00 Kips	17.39 Kips
12.99 ft	69.18 Kips	0.00 Kips	69.18 Kips
13.01 ft	69.36 Kips	0.00 Kips	69.36 Kips
17.99 ft	110.72 Kips	0.00 Kips	110.72 Kips
18.01 ft	110.91 Kips	0.00 Kips	110.91 Kips
22.99 ft	162.70 Kips	0.00 Kips	162.70 Kips
23.01 ft	162.94 Kips	283.10 Kips	446.04 Kips
32.01 ft	311.86 Kips	414.04 Kips	725.90 Kips
41.01 ft	516.73 Kips	544.84 Kips	1061.58 Kips
42.99 ft	569.31 Kips	573.37 Kips	1142.68 Kips
43.01 ft	569.74 Kips	106.24 Kips	675.98 Kips
47.99 ft	652.10 Kips	106.24 Kips	758.34 Kips
48.01 ft	652.56 Kips	541.28 Kips	1193.84 Kips
52.99 ft	802.20 Kips	541.28 Kips	1343.48 Kips
53.01 ft	802.70 Kips	88.82 Kips	891.53 Kips
59.99 ft	940.28 Kips	88.82 Kips	1029.10 Kips

DRIVING - SKIN FRICTION

Depth	Soil Type	Effective Stress At Midpoint	Sliding Friction Angle	Adhesion	Skin Friction
0.01 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
4.99 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
5.00 ft	Cohesionless	238.00 psf	27.58	N/A	0.00 Kips
5.99 ft	Cohesionless	261.56 psf	27.58	N/A	1.27 Kips
6.01 ft	Cohesive	N/A	N/A	1000.00 psf	1.36 Kips
7.99 ft	Cohesive	N/A	N/A	1000.00 psf	17.20 Kips
8.01 ft	Cohesive	N/A	N/A	1300.00 psf	17.39 Kips
12.99 ft	Cohesive	N/A	N/A	1300.00 psf	69.18 Kips
13.01 ft	Cohesive	N/A	N/A	1038.00 psf	69.36 Kips
17.99 ft	Cohesive	N/A	N/A	1038.00 psf	110.72 Kips
18.01 ft	Cohesive	N/A	N/A	1300.00 psf	110.91 Kips
22.99 ft	Cohesive	N/A	N/A	1300.00 psf	162.70 Kips
23.01 ft	Cohesionless	1315.14 psf	32.90	N/A	162.94 Kips
32.01 ft	Cohesionless	1619.34 psf	32.90	N/A	311.86 Kips
41.01 ft	Cohesionless	1923.54 psf	32.90	N/A	516.73 Kips
42.99 ft	Cohesionless	1990.46 psf	32.90	N/A	569.31 Kips
43.01 ft	Cohesionless	2667.09 psf	28.83	N/A	569.74 Kips
47.99 ft	Cohesionless	2810.51 psf	28.83	N/A	652.10 Kips
48.01 ft	Cohesionless	2955.14 psf	32.57	N/A	652.56 Kips
52.99 ft	Cohesionless	3123.46 psf	32.57	N/A	802.20 Kips
53.01 ft	Cohesionless	3293.09 psf	28.53	N/A	802.70 Kips
59.99 ft	Cohesionless	3494.11 psf	28.53	N/A	940.28 Kips

DRIVING - END BEARING

Depth	Soil Type	Effective Stress At Tip	Bearing Cap. Factor	Limiting End Bearing	End Bearing
0.01 ft	Cohesionless	0.00 psf	30.68	57.10 Kips	0.00 Kips
4.99 ft	Cohesionless	0.00 psf	30.68	57.10 Kips	0.00 Kips
5.00 ft	Cohesionless	238.00 psf	30.68	57.10 Kips	17.02 Kips
5.99 ft	Cohesionless	285.12 psf	30.68	57.10 Kips	20.40 Kips
6.01 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
7.99 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
8.01 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
12.99 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
13.01 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
17.99 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
18.01 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
22.99 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
23.01 ft	Cohesionless	1315.48 psf	77.60	606.40 Kips	283.10 Kips
32.01 ft	Cohesionless	1923.88 psf	77.60	606.40 Kips	414.04 Kips
41.01 ft	Cohesionless	2532.28 psf	77.60	606.40 Kips	544.84 Kips
42.99 ft	Cohesionless	2666.12 psf	77.60	606.40 Kips	573.37 Kips
43.01 ft	Cohesionless	2667.38 psf	38.01	106.24 Kips	106.24 Kips
47.99 ft	Cohesionless	2954.22 psf	38.01	106.24 Kips	106.24 Kips
48.01 ft	Cohesionless	2955.48 psf	72.57	541.28 Kips	541.28 Kips
52.99 ft	Cohesionless	3292.12 psf	72.57	541.28 Kips	541.28 Kips
53.01 ft	Cohesionless	3293.38 psf	36.29	88.82 Kips	88.82 Kips
59.99 ft	Cohesionless	3695.42 psf	36.29	88.82 Kips	88.82 Kips

DRIVING - SUMMARY OF CAPACITIES

Depth	Skin Friction	End Bearing	Total Capacity
0.01 ft	0.00 Kips	0.00 Kips	0.00 Kips
4.99 ft	0.00 Kips	0.00 Kips	0.00 Kips
5.00 ft	0.00 Kips	17.02 Kips	17.02 Kips
5.99 ft	1.27 Kips	20.40 Kips	21.66 Kips
6.01 ft	1.36 Kips	0.00 Kips	1.36 Kips
7.99 ft	17.20 Kips	0.00 Kips	17.20 Kips
8.01 ft	17.39 Kips	0.00 Kips	17.39 Kips
12.99 ft	69.18 Kips	0.00 Kips	69.18 Kips
13.01 ft	69.36 Kips	0.00 Kips	69.36 Kips
17.99 ft	110.72 Kips	0.00 Kips	110.72 Kips
18.01 ft	110.91 Kips	0.00 Kips	110.91 Kips
22.99 ft	162.70 Kips	0.00 Kips	162.70 Kips
23.01 ft	162.94 Kips	283.10 Kips	446.04 Kips
32.01 ft	311.86 Kips	414.04 Kips	725.90 Kips
41.01 ft	516.73 Kips	544.84 Kips	1061.58 Kips
42.99 ft	569.31 Kips	573.37 Kips	1142.68 Kips
43.01 ft	569.74 Kips	106.24 Kips	675.98 Kips
47.99 ft	652.10 Kips	106.24 Kips	758.34 Kips
48.01 ft	652.56 Kips	541.28 Kips	1193.84 Kips
52.99 ft	802.20 Kips	541.28 Kips	1343.48 Kips
53.01 ft	802.70 Kips	88.82 Kips	891.53 Kips
59.99 ft	940.28 Kips	88.82 Kips	1029.10 Kips

ULTIMATE - SKIN FRICTION

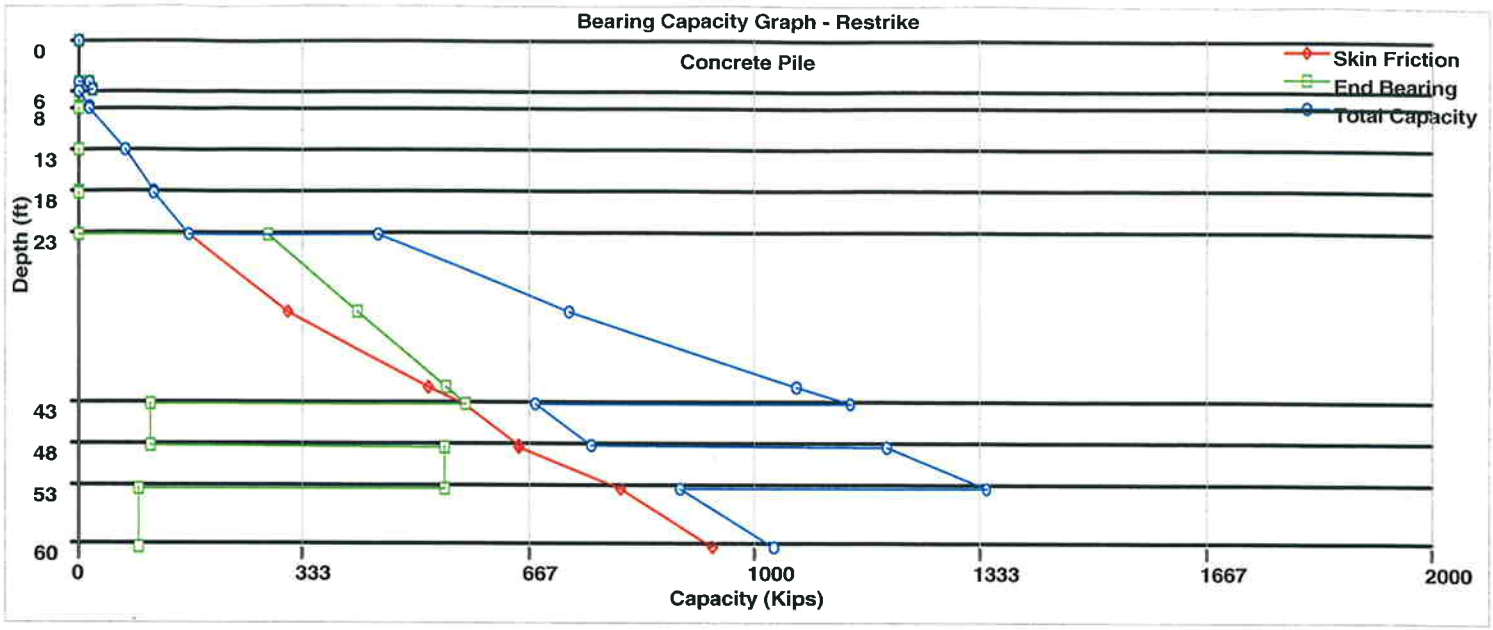
Depth	Soil Type	Effective Stress At Midpoint	Sliding Friction Angle	Adhesion	Skin Friction
0.01 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
4.99 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
5.00 ft	Cohesionless	550.00 psf	27.58	N/A	0.00 Kips
5.99 ft	Cohesionless	604.45 psf	27.58	N/A	2.93 Kips
6.01 ft	Cohesive	N/A	N/A	1000.00 psf	3.04 Kips
7.99 ft	Cohesive	N/A	N/A	1000.00 psf	18.88 Kips
8.01 ft	Cohesive	N/A	N/A	1300.00 psf	19.07 Kips
12.99 ft	Cohesive	N/A	N/A	1300.00 psf	70.86 Kips
13.01 ft	Cohesive	N/A	N/A	1038.00 psf	71.04 Kips
17.99 ft	Cohesive	N/A	N/A	1038.00 psf	112.40 Kips
18.01 ft	Cohesive	N/A	N/A	1300.00 psf	112.59 Kips
22.99 ft	Cohesive	N/A	N/A	1300.00 psf	164.38 Kips
23.01 ft	Cohesionless	2563.14 psf	32.90	N/A	164.74 Kips
32.01 ft	Cohesionless	2867.34 psf	32.90	N/A	428.42 Kips
41.01 ft	Cohesionless	3171.54 psf	32.90	N/A	748.05 Kips
42.99 ft	Cohesionless	3238.46 psf	32.90	N/A	825.87 Kips
43.01 ft	Cohesionless	3915.09 psf	28.83	N/A	826.50 Kips
47.99 ft	Cohesionless	4058.51 psf	28.83	N/A	945.43 Kips
48.01 ft	Cohesionless	4203.14 psf	32.57	N/A	946.08 Kips
52.99 ft	Cohesionless	4371.46 psf	32.57	N/A	1155.51 Kips
53.01 ft	Cohesionless	4541.09 psf	28.53	N/A	1156.20 Kips
59.99 ft	Cohesionless	4742.11 psf	28.53	N/A	1342.91 Kips

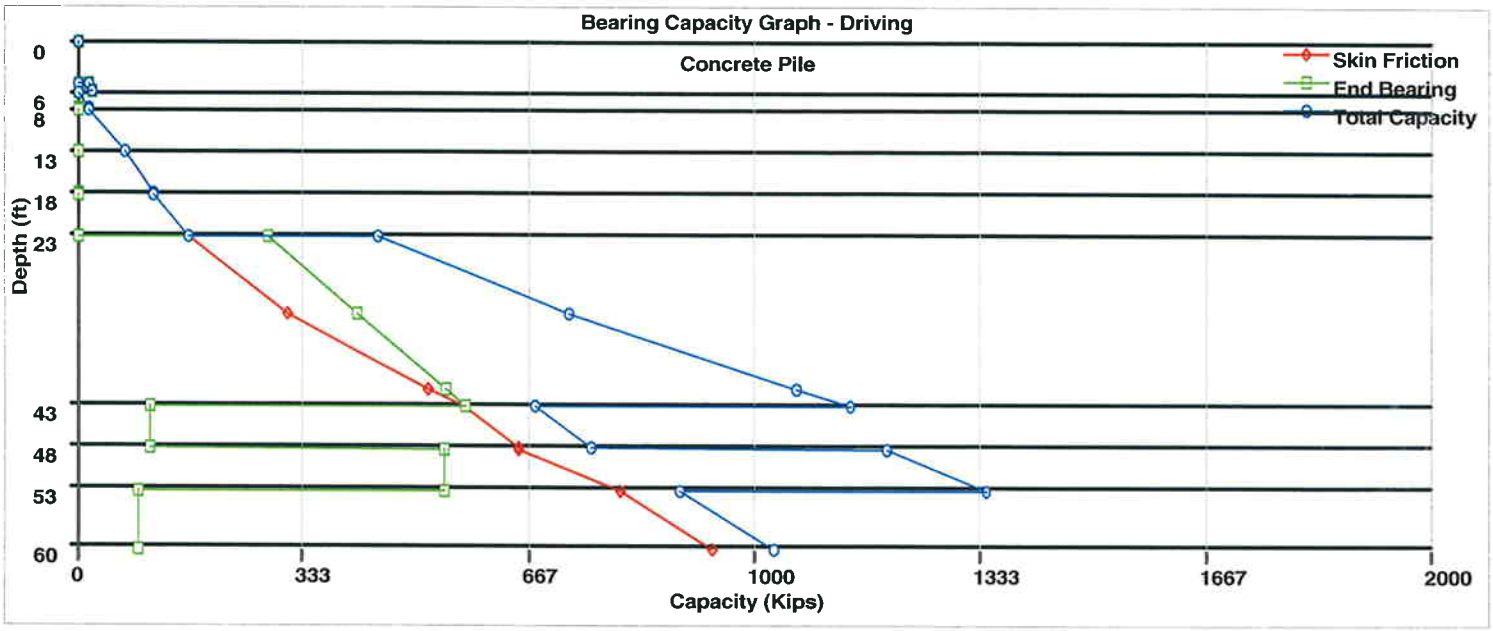
ULTIMATE - END BEARING

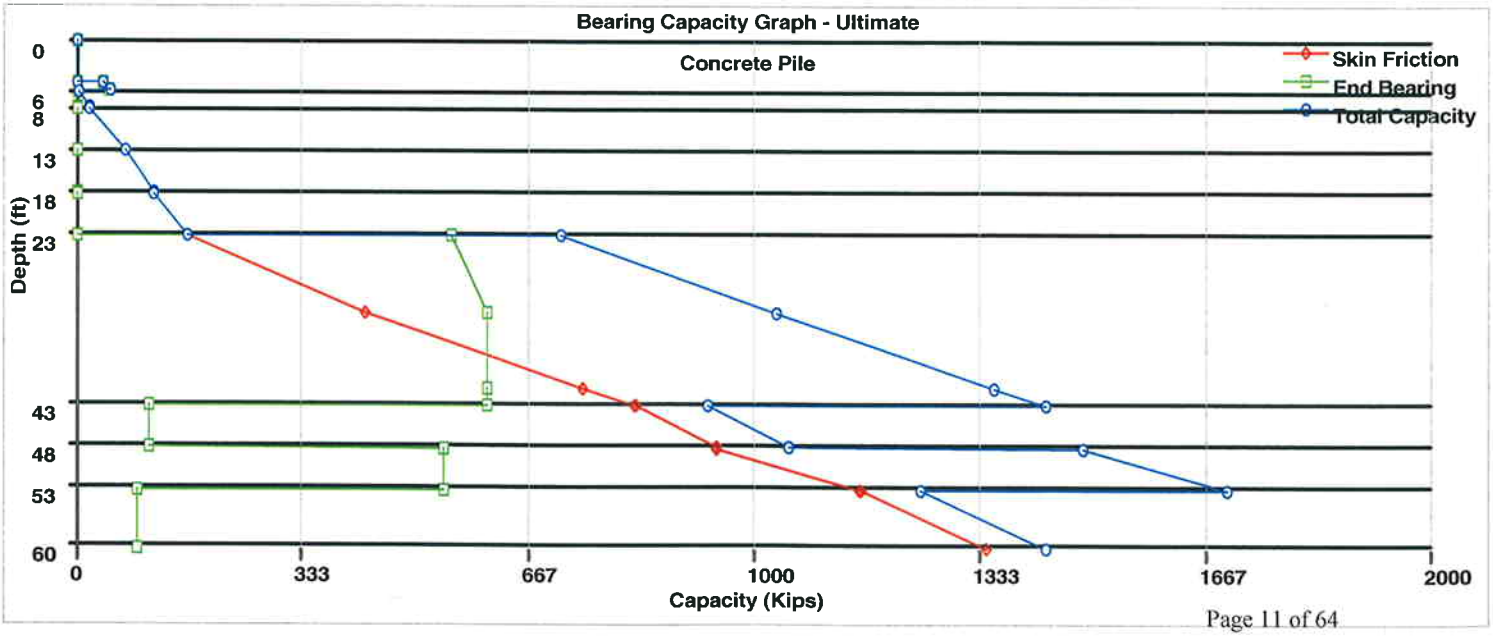
Depth	Soil Type	Effective Stress At Tip	Bearing Cap. Factor	Limiting End Bearing	End Bearing
0.01 ft	Cohesionless	0.00 psf	30.68	57.10 Kips	0.00 Kips
4.99 ft	Cohesionless	0.00 psf	30.68	57.10 Kips	0.00 Kips
5.00 ft	Cohesionless	550.00 psf	30.68	57.10 Kips	39.34 Kips
5.99 ft	Cohesionless	658.90 psf	30.68	57.10 Kips	47.13 Kips
6.01 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
7.99 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
8.01 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
12.99 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
13.01 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
17.99 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
18.01 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
22.99 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
23.01 ft	Cohesionless	2563.48 psf	77.60	606.40 Kips	551.69 Kips
32.01 ft	Cohesionless	3171.88 psf	77.60	606.40 Kips	606.40 Kips
41.01 ft	Cohesionless	3780.28 psf	77.60	606.40 Kips	606.40 Kips
42.99 ft	Cohesionless	3914.12 psf	77.60	606.40 Kips	606.40 Kips
43.01 ft	Cohesionless	3915.38 psf	38.01	106.24 Kips	106.24 Kips
47.99 ft	Cohesionless	4202.22 psf	38.01	106.24 Kips	106.24 Kips
48.01 ft	Cohesionless	4203.48 psf	72.57	541.28 Kips	541.28 Kips
52.99 ft	Cohesionless	4540.12 psf	72.57	541.28 Kips	541.28 Kips
53.01 ft	Cohesionless	4541.38 psf	36.29	88.82 Kips	88.82 Kips
59.99 ft	Cohesionless	4943.42 psf	36.29	88.82 Kips	88.82 Kips

ULTIMATE - SUMMARY OF CAPACITIES

Depth	Skin Friction	End Bearing	Total Capacity
0.01 ft	0.00 Kips	0.00 Kips	0.00 Kips
4.99 ft	0.00 Kips	0.00 Kips	0.00 Kips
5.00 ft	0.00 Kips	39.34 Kips	39.34 Kips
5.99 ft	2.93 Kips	47.13 Kips	50.06 Kips
6.01 ft	3.04 Kips	0.00 Kips	3.04 Kips
7.99 ft	18.88 Kips	0.00 Kips	18.88 Kips
8.01 ft	19.07 Kips	0.00 Kips	19.07 Kips
12.99 ft	70.86 Kips	0.00 Kips	70.86 Kips
13.01 ft	71.04 Kips	0.00 Kips	71.04 Kips
17.99 ft	112.40 Kips	0.00 Kips	112.40 Kips
18.01 ft	112.59 Kips	0.00 Kips	112.59 Kips
22.99 ft	164.38 Kips	0.00 Kips	164.38 Kips
23.01 ft	164.74 Kips	551.69 Kips	716.43 Kips
32.01 ft	428.42 Kips	606.40 Kips	1034.82 Kips
41.01 ft	748.05 Kips	606.40 Kips	1354.45 Kips
42.99 ft	825.87 Kips	606.40 Kips	1432.27 Kips
43.01 ft	826.50 Kips	106.24 Kips	932.74 Kips
47.99 ft	945.43 Kips	106.24 Kips	1051.67 Kips
48.01 ft	946.08 Kips	541.28 Kips	1487.36 Kips
52.99 ft	1155.51 Kips	541.28 Kips	1696.79 Kips
53.01 ft	1156.20 Kips	88.82 Kips	1245.02 Kips
59.99 ft	1342.91 Kips	88.82 Kips	1431.73 Kips


Bearing Capacity Graph - Restrike
Concrete Pile
Skin Friction
End Bearing
Total Capacity
Depth (ft)
0
6
8
13
18
23
43
48
53
60
0
333
667
1000
1333
1667
2000
Capacity (Kips)


Bearing Capacity Graph - Driving
Concrete Pile
Skin Friction
End Bearing
Total Capacity
Depth (ft)
0
6
8
13
18
23
43
48
53
60
0
333
667
1000
1333
1667
2000
Capacity (Kips)


Bearing Capacity Graph - Ultimate
Concrete Pile
Skin Friction
End Bearing
Total Capacity
Depth (ft)
0
6
8
13
18
23
43
48
53
60
0
333
667
1000
1333
1667
2000
Capacity (Kips)

DRIVEN 1.0

GENERAL PROJECT INFORMATION

Filename: C:\DOCUME~1\AWIJAYA\DESKTOP\DRIVEN\ALTAMA~1\BENT7~1.DVN
Project Name: Altamaha River - BENT 7 Project Date: 06/20/2012
Project Client: Heath Lineback
Computed By: AW
Project Manager: SS

PILE INFORMATION

Pile Type: Concrete Pile
Top of Pile: 0.00 ft
Length of Square Side: 18.00 in

ULTIMATE CONSIDERATIONS

Water Table Depth At Time Of:	- Drilling:	11.70 ft
	- Driving/Restrike	0.00 ft
	- Ultimate:	-18.50 ft
Ultimate Considerations:	- Local Scour:	4.46 ft
	- Long Term Scour:	0.00 ft
	- Soft Soil:	0.00 ft

ULTIMATE PROFILE

Layer	Type	Thickness	Driving Loss	Unit Weight	Strength	Ultimate Curve
1	Cohesive	3.00 ft	0.00%	120.00 pcf	0.00 psf	User Def.
2	Cohesionless	15.00 ft	0.00%	120.00 pcf	33.9/33.9	Nordlund
3	Cohesionless	5.00 ft	0.00%	120.00 pcf	31.9/31.9	Nordlund
4	Cohesionless	5.00 ft	0.00%	110.00 pcf	29.9/29.9	Nordlund
5	Cohesionless	5.00 ft	0.00%	120.00 pcf	30.1/30.1	Nordlund
6	Cohesive	5.00 ft	0.00%	120.00 pcf	0.00 psf	User Def.
7	Cohesive	5.00 ft	0.00%	130.00 pcf	0.00 psf	User Def.
8	Cohesionless	5.00 ft	0.00%	130.00 pcf	36.0/36.0	Nordlund
9	Cohesionless	17.00 ft	0.00%	130.00 pcf	36.0/36.0	Nordlund

RESTRIKE - SKIN FRICTION

Depth	Soil Type	Effective Stress At Midpoint	Sliding Friction Angle	Adhesion	Skin Friction
0.01 ft	Cohesive	N/A	N/A	1081.00 psf	0.06 Kips
2.99 ft	Cohesive	N/A	N/A	1081.00 psf	19.39 Kips
3.01 ft	Cohesionless	173.09 psf	30.97	N/A	19.47 Kips
12.01 ft	Cohesionless	432.29 psf	30.97	N/A	40.41 Kips
17.99 ft	Cohesionless	604.51 psf	30.97	N/A	68.21 Kips
18.01 ft	Cohesionless	1037.09 psf	29.15	N/A	68.31 Kips
22.99 ft	Cohesionless	1180.51 psf	29.15	N/A	93.70 Kips
23.01 ft	Cohesionless	1325.04 psf	27.36	N/A	93.80 Kips
27.99 ft	Cohesionless	1443.56 psf	27.36	N/A	117.96 Kips
28.01 ft	Cohesionless	1563.09 psf	27.55	N/A	118.06 Kips
32.99 ft	Cohesionless	1706.51 psf	27.55	N/A	147.35 Kips
33.01 ft	Cohesive	N/A	N/A	805.00 psf	147.47 Kips
37.99 ft	Cohesive	N/A	N/A	805.00 psf	171.52 Kips
38.01 ft	Cohesive	N/A	N/A	2100.00 psf	171.69 Kips
42.99 ft	Cohesive	N/A	N/A	2100.00 psf	234.44 Kips
43.01 ft	Cohesionless	2477.14 psf	32.90	N/A	234.74 Kips
47.99 ft	Cohesionless	2645.46 psf	32.90	N/A	328.07 Kips
48.01 ft	Cohesionless	2815.14 psf	32.90	N/A	328.47 Kips
57.01 ft	Cohesionless	3119.34 psf	32.90	N/A	527.34 Kips
64.99 ft	Cohesionless	3389.06 psf	32.90	N/A	736.12 Kips

RESTRIKE - END BEARING

Depth	Soil Type	Effective Stress At Tip	Bearing Cap. Factor	Limiting End Bearing	End Bearing
0.01 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
2.99 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
3.01 ft	Cohesionless	173.38 psf	54.65	156.71 Kips	14.09 Kips
12.01 ft	Cohesionless	691.78 psf	54.65	156.71 Kips	56.21 Kips
17.99 ft	Cohesionless	1036.22 psf	54.65	156.71 Kips	84.20 Kips
18.01 ft	Cohesionless	1037.38 psf	39.83	70.80 Kips	57.93 Kips
22.99 ft	Cohesionless	1324.22 psf	39.83	70.80 Kips	70.80 Kips
23.01 ft	Cohesionless	1325.28 psf	29.75	29.97 Kips	29.97 Kips
27.99 ft	Cohesionless	1562.32 psf	29.75	29.97 Kips	29.97 Kips
28.01 ft	Cohesionless	1563.38 psf	30.72	32.26 Kips	32.26 Kips
32.99 ft	Cohesionless	1850.22 psf	30.72	32.26 Kips	32.26 Kips
33.01 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
37.99 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
38.01 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
42.99 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
43.01 ft	Cohesionless	2477.48 psf	77.60	341.10 Kips	298.66 Kips
47.99 ft	Cohesionless	2814.12 psf	77.60	341.10 Kips	338.81 Kips
48.01 ft	Cohesionless	2815.48 psf	77.60	341.10 Kips	338.97 Kips
57.01 ft	Cohesionless	3423.88 psf	77.60	341.10 Kips	341.10 Kips
64.99 ft	Cohesionless	3963.32 psf	77.60	341.10 Kips	341.10 Kips

RESTRIKE - SUMMARY OF CAPACITIES

Depth	Skin Friction	End Bearing	Total Capacity
0.01 ft	0.06 Kips	0.00 Kips	0.06 Kips
2.99 ft	19.39 Kips	0.00 Kips	19.39 Kips
3.01 ft	19.47 Kips	14.09 Kips	33.55 Kips
12.01 ft	40.41 Kips	56.21 Kips	96.62 Kips
17.99 ft	68.21 Kips	84.20 Kips	152.41 Kips
18.01 ft	68.31 Kips	57.93 Kips	126.24 Kips
22.99 ft	93.70 Kips	70.80 Kips	164.50 Kips
23.01 ft	93.80 Kips	29.97 Kips	123.77 Kips
27.99 ft	117.96 Kips	29.97 Kips	147.93 Kips
28.01 ft	118.06 Kips	32.26 Kips	150.32 Kips
32.99 ft	147.35 Kips	32.26 Kips	179.61 Kips
33.01 ft	147.47 Kips	0.00 Kips	147.47 Kips
37.99 ft	171.52 Kips	0.00 Kips	171.52 Kips
38.01 ft	171.69 Kips	0.00 Kips	171.69 Kips
42.99 ft	234.44 Kips	0.00 Kips	234.44 Kips
43.01 ft	234.74 Kips	298.66 Kips	533.41 Kips
47.99 ft	328.07 Kips	338.81 Kips	666.88 Kips
48.01 ft	328.47 Kips	338.97 Kips	667.44 Kips
57.01 ft	527.34 Kips	341.10 Kips	868.44 Kips
64.99 ft	736.12 Kips	341.10 Kips	1077.22 Kips

DRIVING - SKIN FRICTION

Depth	Soil Type	Effective Stress At Midpoint	Sliding Friction Angle	Adhesion	Skin Friction
0.01 ft	Cohesive	N/A	N/A	1081.00 psf	0.06 Kips
2.99 ft	Cohesive	N/A	N/A	1081.00 psf	19.39 Kips
3.01 ft	Cohesionless	173.09 psf	30.97	N/A	19.47 Kips
12.01 ft	Cohesionless	432.29 psf	30.97	N/A	40.41 Kips
17.99 ft	Cohesionless	604.51 psf	30.97	N/A	68.21 Kips
18.01 ft	Cohesionless	1037.09 psf	29.15	N/A	68.31 Kips
22.99 ft	Cohesionless	1180.51 psf	29.15	N/A	93.70 Kips
23.01 ft	Cohesionless	1325.04 psf	27.36	N/A	93.80 Kips
27.99 ft	Cohesionless	1443.56 psf	27.36	N/A	117.96 Kips
28.01 ft	Cohesionless	1563.09 psf	27.55	N/A	118.06 Kips
32.99 ft	Cohesionless	1706.51 psf	27.55	N/A	147.35 Kips
33.01 ft	Cohesive	N/A	N/A	805.00 psf	147.47 Kips
37.99 ft	Cohesive	N/A	N/A	805.00 psf	171.52 Kips
38.01 ft	Cohesive	N/A	N/A	2100.00 psf	171.69 Kips
42.99 ft	Cohesive	N/A	N/A	2100.00 psf	234.44 Kips
43.01 ft	Cohesionless	2477.14 psf	32.90	N/A	234.74 Kips
47.99 ft	Cohesionless	2645.46 psf	32.90	N/A	328.07 Kips
48.01 ft	Cohesionless	2815.14 psf	32.90	N/A	328.47 Kips
57.01 ft	Cohesionless	3119.34 psf	32.90	N/A	527.34 Kips
64.99 ft	Cohesionless	3389.06 psf	32.90	N/A	736.12 Kips

DRIVING - END BEARING

Depth	Soil Type	Effective Stress At Tip	Bearing Cap. Factor	Limiting End Bearing	End Bearing
0.01 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
2.99 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
3.01 ft	Cohesionless	173.38 psf	54.65	156.71 Kips	14.09 Kips
12.01 ft	Cohesionless	691.78 psf	54.65	156.71 Kips	56.21 Kips
17.99 ft	Cohesionless	1036.22 psf	54.65	156.71 Kips	84.20 Kips
18.01 ft	Cohesionless	1037.38 psf	39.83	70.80 Kips	57.93 Kips
22.99 ft	Cohesionless	1324.22 psf	39.83	70.80 Kips	70.80 Kips
23.01 ft	Cohesionless	1325.28 psf	29.75	29.97 Kips	29.97 Kips
27.99 ft	Cohesionless	1562.32 psf	29.75	29.97 Kips	29.97 Kips
28.01 ft	Cohesionless	1563.38 psf	30.72	32.26 Kips	32.26 Kips
32.99 ft	Cohesionless	1850.22 psf	30.72	32.26 Kips	32.26 Kips
33.01 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
37.99 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
38.01 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
42.99 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
43.01 ft	Cohesionless	2477.48 psf	77.60	341.10 Kips	298.66 Kips
47.99 ft	Cohesionless	2814.12 psf	77.60	341.10 Kips	338.81 Kips
48.01 ft	Cohesionless	2815.48 psf	77.60	341.10 Kips	338.97 Kips
57.01 ft	Cohesionless	3423.88 psf	77.60	341.10 Kips	341.10 Kips
64.99 ft	Cohesionless	3963.32 psf	77.60	341.10 Kips	341.10 Kips

DRIVING - SUMMARY OF CAPACITIES

Depth	Skin Friction	End Bearing	Total Capacity
0.01 ft	0.06 Kips	0.00 Kips	0.06 Kips
2.99 ft	19.39 Kips	0.00 Kips	19.39 Kips
3.01 ft	19.47 Kips	14.09 Kips	33.55 Kips
12.01 ft	40.41 Kips	56.21 Kips	96.62 Kips
17.99 ft	68.21 Kips	84.20 Kips	152.41 Kips
18.01 ft	68.31 Kips	57.93 Kips	126.24 Kips
22.99 ft	93.70 Kips	70.80 Kips	164.50 Kips
23.01 ft	93.80 Kips	29.97 Kips	123.77 Kips
27.99 ft	117.96 Kips	29.97 Kips	147.93 Kips
28.01 ft	118.06 Kips	32.26 Kips	150.32 Kips
32.99 ft	147.35 Kips	32.26 Kips	179.61 Kips
33.01 ft	147.47 Kips	0.00 Kips	147.47 Kips
37.99 ft	171.52 Kips	0.00 Kips	171.52 Kips
38.01 ft	171.69 Kips	0.00 Kips	171.69 Kips
42.99 ft	234.44 Kips	0.00 Kips	234.44 Kips
43.01 ft	234.74 Kips	298.66 Kips	533.41 Kips
47.99 ft	328.07 Kips	338.81 Kips	666.88 Kips
48.01 ft	328.47 Kips	338.97 Kips	667.44 Kips
57.01 ft	527.34 Kips	341.10 Kips	868.44 Kips
64.99 ft	736.12 Kips	341.10 Kips	1077.22 Kips

ULTIMATE - SKIN FRICTION

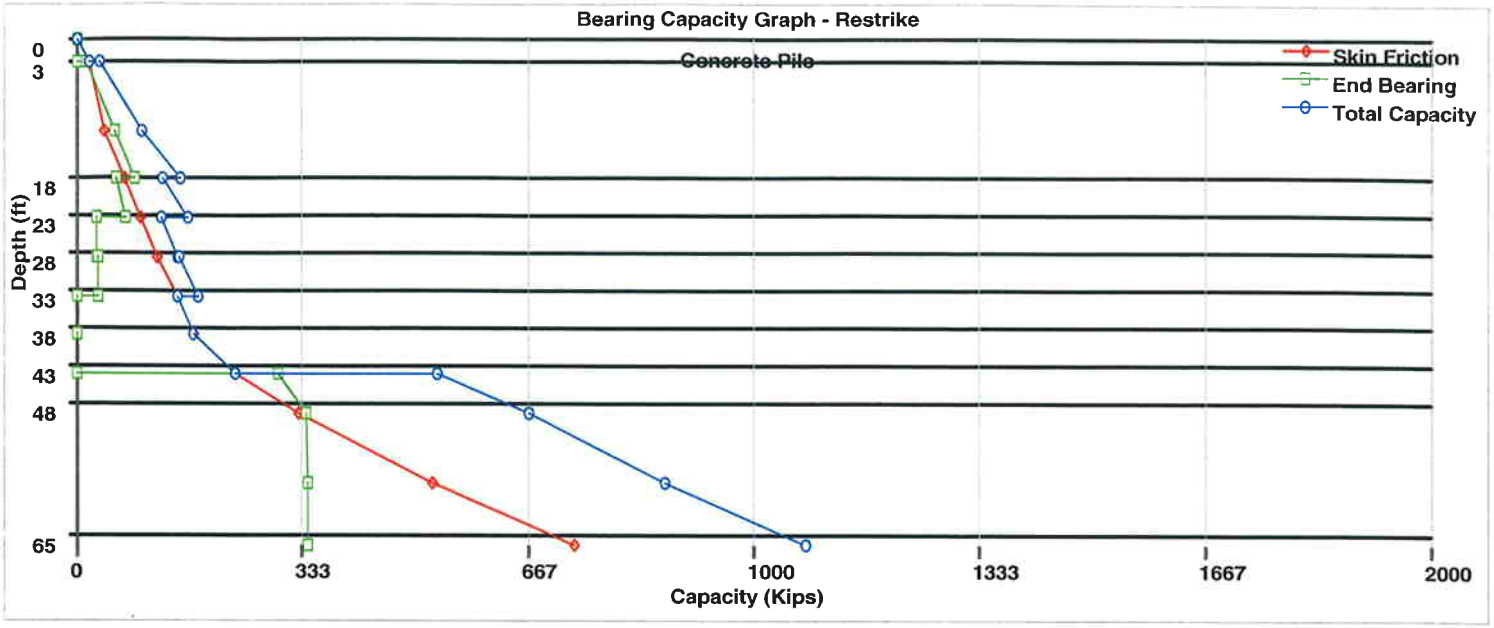
Depth	Soil Type	Effective Stress At Midpoint	Sliding Friction Angle	Adhesion	Skin Friction
0.01 ft	Cohesive	N/A	N/A	0.00 psf	0.00 Kips
2.99 ft	Cohesive	N/A	N/A	0.00 psf	0.00 Kips
3.01 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
4.45 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
4.46 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
12.01 ft	Cohesionless	474.34 psf	30.97	N/A	19.27 Kips
17.99 ft	Cohesionless	646.56 psf	30.97	N/A	47.07 Kips
18.01 ft	Cohesionless	1037.09 psf	29.15	N/A	47.17 Kips
22.99 ft	Cohesionless	1180.51 psf	29.15	N/A	72.55 Kips
23.01 ft	Cohesionless	1325.04 psf	27.36	N/A	72.65 Kips
27.99 ft	Cohesionless	1443.56 psf	27.36	N/A	96.81 Kips
28.01 ft	Cohesionless	1563.09 psf	27.55	N/A	96.92 Kips
32.99 ft	Cohesionless	1706.51 psf	27.55	N/A	126.21 Kips
33.01 ft	Cohesive	N/A	N/A	805.00 psf	126.32 Kips
37.99 ft	Cohesive	N/A	N/A	805.00 psf	150.37 Kips
38.01 ft	Cohesive	N/A	N/A	2100.00 psf	150.55 Kips
42.99 ft	Cohesive	N/A	N/A	2100.00 psf	213.30 Kips
43.01 ft	Cohesionless	2477.14 psf	32.90	N/A	213.60 Kips
47.99 ft	Cohesionless	2645.46 psf	32.90	N/A	306.93 Kips
48.01 ft	Cohesionless	2815.14 psf	32.90	N/A	307.32 Kips
57.01 ft	Cohesionless	3119.34 psf	32.90	N/A	506.20 Kips
64.99 ft	Cohesionless	3389.06 psf	32.90	N/A	714.97 Kips

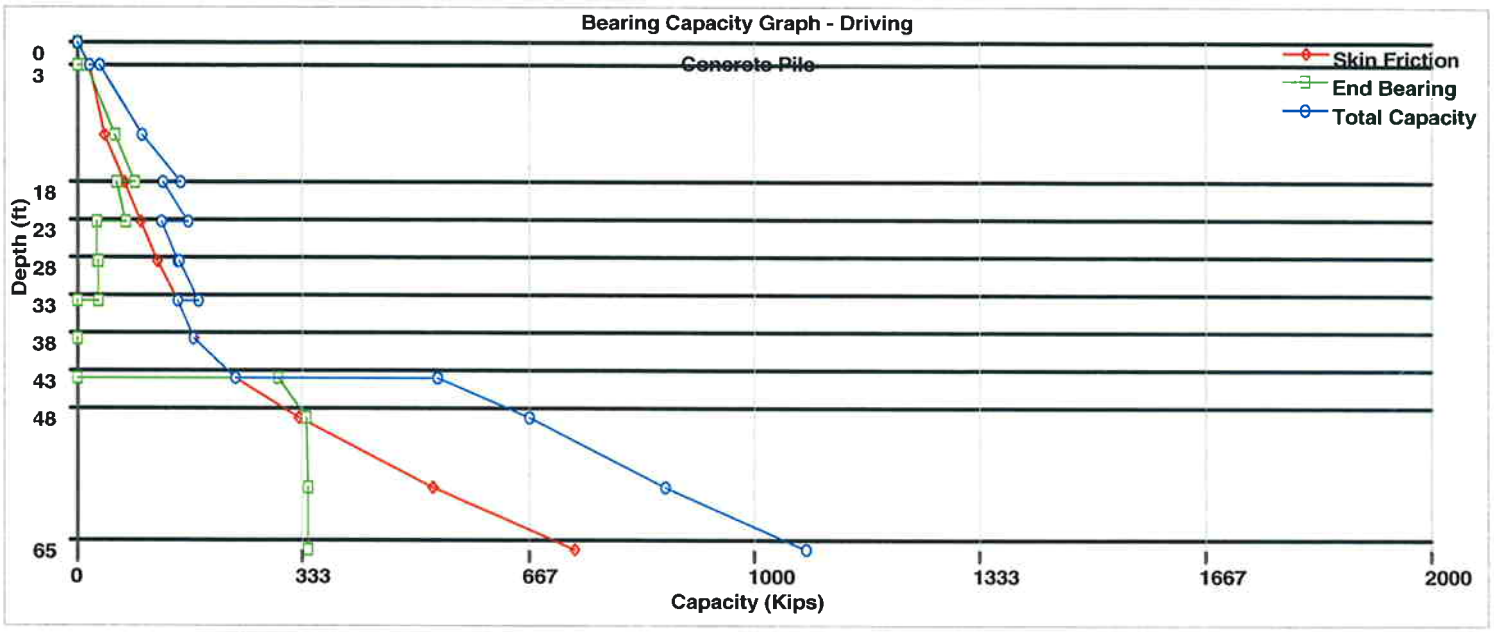
ULTIMATE - END BEARING

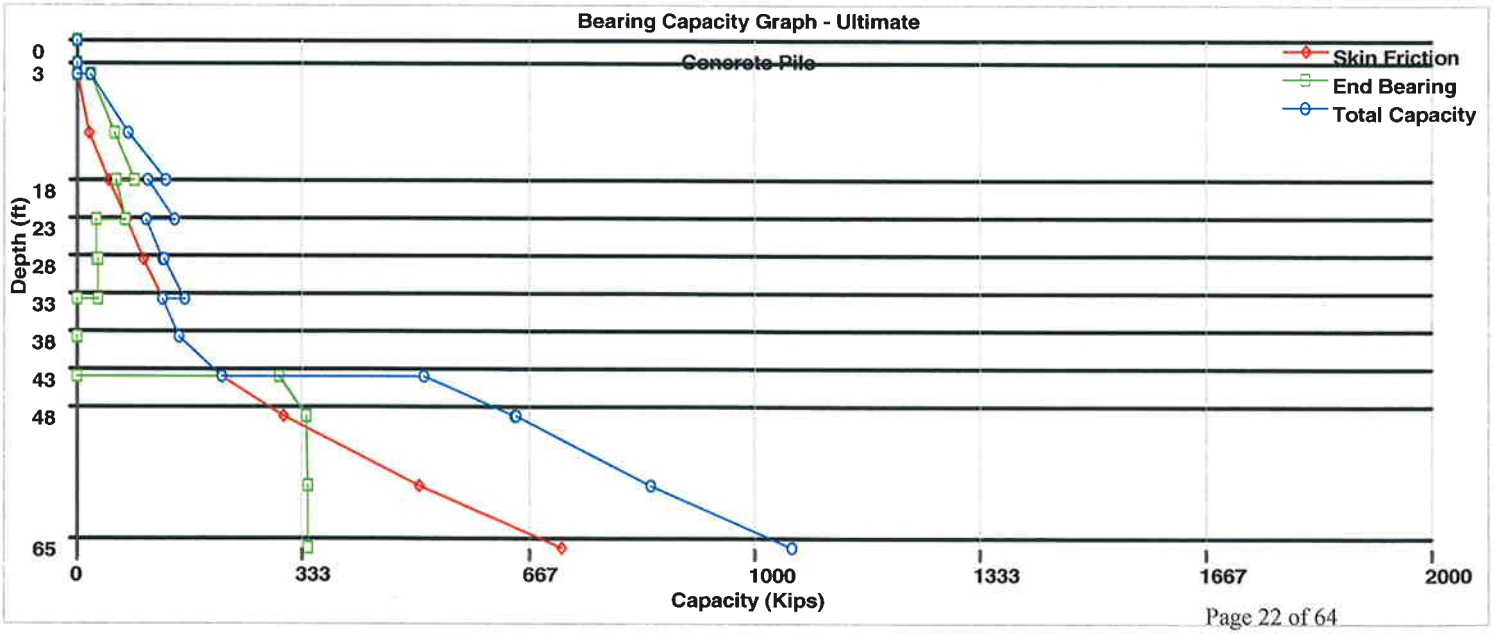
Depth	Soil Type	Effective Stress At Tip	Bearing Cap. Factor	Limiting End Bearing	End Bearing
0.01 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
2.99 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
3.01 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
4.45 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
4.46 ft	Cohesionless	256.90 psf	54.65	156.71 Kips	20.87 Kips
12.01 ft	Cohesionless	691.78 psf	54.65	156.71 Kips	56.21 Kips
17.99 ft	Cohesionless	1036.22 psf	54.65	156.71 Kips	84.20 Kips
18.01 ft	Cohesionless	1037.38 psf	39.83	70.80 Kips	57.93 Kips
22.99 ft	Cohesionless	1324.22 psf	39.83	70.80 Kips	70.80 Kips
23.01 ft	Cohesionless	1325.28 psf	29.75	29.97 Kips	29.97 Kips
27.99 ft	Cohesionless	1562.32 psf	29.75	29.97 Kips	29.97 Kips
28.01 ft	Cohesionless	1563.38 psf	30.72	32.26 Kips	32.26 Kips
32.99 ft	Cohesionless	1850.22 psf	30.72	32.26 Kips	32.26 Kips
33.01 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
37.99 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
38.01 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
42.99 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
43.01 ft	Cohesionless	2477.48 psf	77.60	341.10 Kips	299.09 Kips
47.99 ft	Cohesionless	2814.12 psf	77.60	341.10 Kips	339.19 Kips
48.01 ft	Cohesionless	2815.48 psf	77.60	341.10 Kips	339.35 Kips
57.01 ft	Cohesionless	3423.88 psf	77.60	341.10 Kips	341.10 Kips
64.99 ft	Cohesionless	3963.32 psf	77.60	341.10 Kips	341.10 Kips

ULTIMATE - SUMMARY OF CAPACITIES

Depth	Skin Friction	End Bearing	Total Capacity
0.01 ft	0.00 Kips	0.00 Kips	0.00 Kips
2.99 ft	0.00 Kips	0.00 Kips	0.00 Kips
3.01 ft	0.00 Kips	0.00 Kips	0.00 Kips
4.45 ft	0.00 Kips	0.00 Kips	0.00 Kips
4.46 ft	0.00 Kips	20.87 Kips	20.87 Kips
12.01 ft	19.27 Kips	56.21 Kips	75.48 Kips
17.99 ft	47.07 Kips	84.20 Kips	131.26 Kips
18.01 ft	47.17 Kips	57.93 Kips	105.10 Kips
22.99 ft	72.55 Kips	70.80 Kips	143.35 Kips
23.01 ft	72.65 Kips	29.97 Kips	102.62 Kips
27.99 ft	96.81 Kips	29.97 Kips	126.78 Kips
28.01 ft	96.92 Kips	32.26 Kips	129.18 Kips
32.99 ft	126.21 Kips	32.26 Kips	158.47 Kips
33.01 ft	126.32 Kips	0.00 Kips	126.32 Kips
37.99 ft	150.37 Kips	0.00 Kips	150.37 Kips
38.01 ft	150.55 Kips	0.00 Kips	150.55 Kips
42.99 ft	213.30 Kips	0.00 Kips	213.30 Kips
43.01 ft	213.60 Kips	299.09 Kips	512.69 Kips
47.99 ft	306.93 Kips	339.19 Kips	646.12 Kips
48.01 ft	307.32 Kips	339.35 Kips	646.67 Kips
57.01 ft	506.20 Kips	341.10 Kips	847.30 Kips
64.99 ft	714.97 Kips	341.10 Kips	1056.07 Kips


Bearing Capacity Graph - Restrike
Concrete Pile
Skin Friction
End Bearing
Total Capacity
Depth (ft)
0
3
18
23
28
33
38
43
48
65
0
333
667
1000
1333
1667
2000
Capacity (Kips)


Bearing Capacity Graph - Driving
Concrete Pile
Skin Friction
End Bearing
Total Capacity
Depth (ft)
0
3
18
23
28
33
38
43
48
65
0
333
667
1000
1333
1667
2000
Capacity (Kips)


Bearing Capacity Graph - Ultimate
Concrete Pile
Skin Friction
End Bearing
Total Capacity
Depth (ft)
0
3
18
23
28
33
38
43
48
65
0
333
667
1000
1333
1667
2000
Capacity (Kips)

DRIVEN 1.0

GENERAL PROJECT INFORMATION

Filename: C:\DOCUME~1\AWIJAYA\DESKTOP\DRIVEN\ALTAMA~1\BENT20~1.DVN
Project Name: Altamaha River - BENT 20 Project Date: 06/19/2012
Project Client: Heath Lineback
Computed By: AW
Project Manager: SS

PILE INFORMATION

Pile Type: Concrete Pile
Top of Pile: 0.00 ft
Length of Square Side: 20.00 in

ULTIMATE CONSIDERATIONS

Water Table Depth At Time Of:	- Drilling:	6.00 ft
	- Driving/Restrike	0.00 ft
	- Ultimate:	-21.00 ft
Ultimate Considerations:	- Local Scour:	3.49 ft
	- Long Term Scour:	0.00 ft
	- Soft Soil:	0.00 ft

ULTIMATE PROFILE

Layer	Type	Thickness	Driving Loss	Unit Weight	Strength	Ultimate Curve
1	Cohesive	2.00 ft	0.00%	120.00 pcf	0.00 psf	User Def.
2	Cohesive	2.00 ft	0.00%	120.00 pcf	0.00 psf	User Def.
3	Cohesive	2.00 ft	0.00%	120.00 pcf	0.00 psf	User Def.
4	Cohesive	2.00 ft	0.00%	120.00 pcf	0.00 psf	User Def.
5	Cohesionless	5.00 ft	0.00%	110.00 pcf	30.7/30.7	Nordlund
6	Cohesionless	25.00 ft	0.00%	120.00 pcf	32.8/32.8	Nordlund
7	Cohesionless	22.00 ft	0.00%	130.00 pcf	36.0/36.0	Nordlund

RESTRIKE - SKIN FRICTION

Depth	Soil Type	Effective Stress At Midpoint	Sliding Friction Angle	Adhesion	Skin Friction
0.01 ft	Cohesive	N/A	N/A	950.00 psf	0.06 Kips
1.99 ft	Cohesive	N/A	N/A	950.00 psf	12.60 Kips
2.01 ft	Cohesive	N/A	N/A	1038.00 psf	12.74 Kips
3.99 ft	Cohesive	N/A	N/A	1038.00 psf	26.44 Kips
4.01 ft	Cohesive	N/A	N/A	1038.00 psf	26.58 Kips
5.99 ft	Cohesive	N/A	N/A	1038.00 psf	40.28 Kips
6.01 ft	Cohesive	N/A	N/A	950.00 psf	40.41 Kips
7.99 ft	Cohesive	N/A	N/A	950.00 psf	52.95 Kips
8.01 ft	Cohesionless	461.04 psf	28.07	N/A	53.03 Kips
12.99 ft	Cohesionless	579.56 psf	28.07	N/A	65.25 Kips
13.01 ft	Cohesionless	699.09 psf	29.96	N/A	65.32 Kips
22.01 ft	Cohesionless	958.29 psf	29.96	N/A	112.34 Kips
31.01 ft	Cohesionless	1217.49 psf	29.96	N/A	184.79 Kips
37.99 ft	Cohesionless	1418.51 psf	29.96	N/A	258.49 Kips
38.01 ft	Cohesionless	2139.14 psf	32.90	N/A	258.78 Kips
47.01 ft	Cohesionless	2443.34 psf	32.90	N/A	437.05 Kips
56.01 ft	Cohesionless	2747.54 psf	32.90	N/A	659.71 Kips
59.99 ft	Cohesionless	2882.06 psf	32.90	N/A	772.32 Kips

RESTRIKE - END BEARING

Depth	Soil Type	Effective Stress At Tip	Bearing Cap. Factor	Limiting End Bearing	End Bearing
0.01 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
1.99 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
2.01 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
3.99 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
4.01 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
5.99 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
6.01 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
7.99 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
8.01 ft	Cohesionless	461.28 psf	33.69	51.48 Kips	25.74 Kips
12.99 ft	Cohesionless	698.32 psf	33.69	51.48 Kips	38.96 Kips
13.01 ft	Cohesionless	699.38 psf	45.35	126.67 Kips	56.55 Kips
22.01 ft	Cohesionless	1217.78 psf	45.35	126.67 Kips	98.46 Kips
31.01 ft	Cohesionless	1736.18 psf	45.35	126.67 Kips	126.67 Kips
37.99 ft	Cohesionless	2138.22 psf	45.35	126.67 Kips	126.67 Kips
38.01 ft	Cohesionless	2139.48 psf	77.60	421.11 Kips	319.32 Kips
47.01 ft	Cohesionless	2747.88 psf	77.60	421.11 Kips	409.05 Kips
56.01 ft	Cohesionless	3356.28 psf	77.60	421.11 Kips	421.11 Kips
59.99 ft	Cohesionless	3625.32 psf	77.60	421.11 Kips	421.11 Kips

RESTRIKE - SUMMARY OF CAPACITIES

Depth	Skin Friction	End Bearing	Total Capacity
0.01 ft	0.06 Kips	0.00 Kips	0.06 Kips
1.99 ft	12.60 Kips	0.00 Kips	12.60 Kips
2.01 ft	12.74 Kips	0.00 Kips	12.74 Kips
3.99 ft	26.44 Kips	0.00 Kips	26.44 Kips
4.01 ft	26.58 Kips	0.00 Kips	26.58 Kips
5.99 ft	40.28 Kips	0.00 Kips	40.28 Kips
6.01 ft	40.41 Kips	0.00 Kips	40.41 Kips
7.99 ft	52.95 Kips	0.00 Kips	52.95 Kips
8.01 ft	53.03 Kips	25.74 Kips	78.77 Kips
12.99 ft	65.25 Kips	38.96 Kips	104.22 Kips
13.01 ft	65.32 Kips	56.55 Kips	121.87 Kips
22.01 ft	112.34 Kips	98.46 Kips	210.80 Kips
31.01 ft	184.79 Kips	126.67 Kips	311.46 Kips
37.99 ft	258.49 Kips	126.67 Kips	385.15 Kips
38.01 ft	258.78 Kips	319.32 Kips	578.09 Kips
47.01 ft	437.05 Kips	409.05 Kips	846.10 Kips
56.01 ft	659.71 Kips	421.11 Kips	1080.82 Kips
59.99 ft	772.32 Kips	421.11 Kips	1193.43 Kips

DRIVING - SKIN FRICTION

Depth	Soil Type	Effective Stress At Midpoint	Sliding Friction Angle	Adhesion	Skin Friction
0.01 ft	Cohesive	N/A	N/A	950.00 psf	0.06 Kips
1.99 ft	Cohesive	N/A	N/A	950.00 psf	12.60 Kips
2.01 ft	Cohesive	N/A	N/A	1038.00 psf	12.74 Kips
3.99 ft	Cohesive	N/A	N/A	1038.00 psf	26.44 Kips
4.01 ft	Cohesive	N/A	N/A	1038.00 psf	26.58 Kips
5.99 ft	Cohesive	N/A	N/A	1038.00 psf	40.28 Kips
6.01 ft	Cohesive	N/A	N/A	950.00 psf	40.41 Kips
7.99 ft	Cohesive	N/A	N/A	950.00 psf	52.95 Kips
8.01 ft	Cohesionless	461.04 psf	28.07	N/A	53.03 Kips
12.99 ft	Cohesionless	579.56 psf	28.07	N/A	65.25 Kips
13.01 ft	Cohesionless	699.09 psf	29.96	N/A	65.32 Kips
22.01 ft	Cohesionless	958.29 psf	29.96	N/A	112.34 Kips
31.01 ft	Cohesionless	1217.49 psf	29.96	N/A	184.79 Kips
37.99 ft	Cohesionless	1418.51 psf	29.96	N/A	258.49 Kips
38.01 ft	Cohesionless	2139.14 psf	32.90	N/A	258.78 Kips
47.01 ft	Cohesionless	2443.34 psf	32.90	N/A	437.05 Kips
56.01 ft	Cohesionless	2747.54 psf	32.90	N/A	659.71 Kips
59.99 ft	Cohesionless	2882.06 psf	32.90	N/A	772.32 Kips

DRIVING - END BEARING

Depth	Soil Type	Effective Stress At Tip	Bearing Cap. Factor	Limiting End Bearing	End Bearing
0.01 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
1.99 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
2.01 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
3.99 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
4.01 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
5.99 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
6.01 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
7.99 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
8.01 ft	Cohesionless	461.28 psf	33.69	51.48 Kips	25.74 Kips
12.99 ft	Cohesionless	698.32 psf	33.69	51.48 Kips	38.96 Kips
13.01 ft	Cohesionless	699.38 psf	45.35	126.67 Kips	56.55 Kips
22.01 ft	Cohesionless	1217.78 psf	45.35	126.67 Kips	98.46 Kips
31.01 ft	Cohesionless	1736.18 psf	45.35	126.67 Kips	126.67 Kips
37.99 ft	Cohesionless	2138.22 psf	45.35	126.67 Kips	126.67 Kips
38.01 ft	Cohesionless	2139.48 psf	77.60	421.11 Kips	319.32 Kips
47.01 ft	Cohesionless	2747.88 psf	77.60	421.11 Kips	409.05 Kips
56.01 ft	Cohesionless	3356.28 psf	77.60	421.11 Kips	421.11 Kips
59.99 ft	Cohesionless	3625.32 psf	77.60	421.11 Kips	421.11 Kips

DRIVING - SUMMARY OF CAPACITIES

Depth	Skin Friction	End Bearing	Total Capacity
0.01 ft	0.06 Kips	0.00 Kips	0.06 Kips
1.99 ft	12.60 Kips	0.00 Kips	12.60 Kips
2.01 ft	12.74 Kips	0.00 Kips	12.74 Kips
3.99 ft	26.44 Kips	0.00 Kips	26.44 Kips
4.01 ft	26.58 Kips	0.00 Kips	26.58 Kips
5.99 ft	40.28 Kips	0.00 Kips	40.28 Kips
6.01 ft	40.41 Kips	0.00 Kips	40.41 Kips
7.99 ft	52.95 Kips	0.00 Kips	52.95 Kips
8.01 ft	53.03 Kips	25.74 Kips	78.77 Kips
12.99 ft	65.25 Kips	38.96 Kips	104.22 Kips
13.01 ft	65.32 Kips	56.55 Kips	121.87 Kips
22.01 ft	112.34 Kips	98.46 Kips	210.80 Kips
31.01 ft	184.79 Kips	126.67 Kips	311.46 Kips
37.99 ft	258.49 Kips	126.67 Kips	385.15 Kips
38.01 ft	258.78 Kips	319.32 Kips	578.09 Kips
47.01 ft	437.05 Kips	409.05 Kips	846.10 Kips
56.01 ft	659.71 Kips	421.11 Kips	1080.82 Kips
59.99 ft	772.32 Kips	421.11 Kips	1193.43 Kips

ULTIMATE - SKIN FRICTION

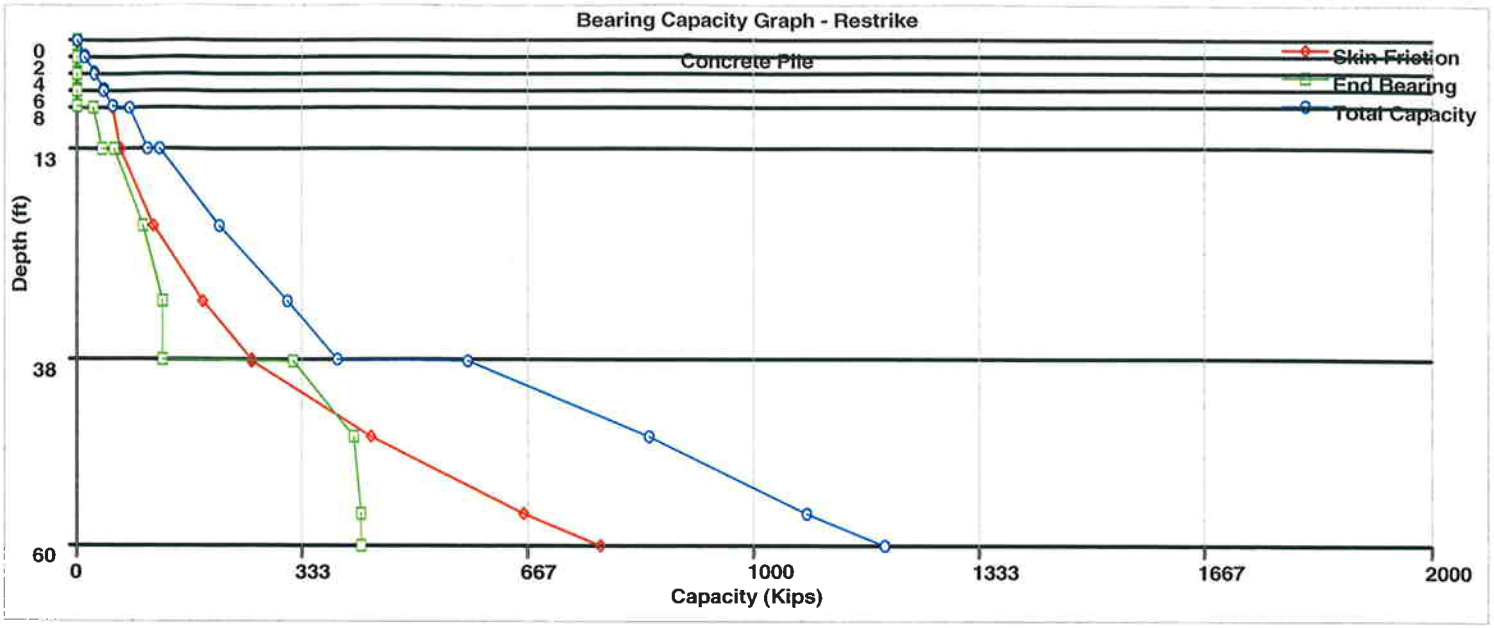
Depth	Soil Type	Effective Stress At Midpoint	Sliding Friction Angle	Adhesion	Skin Friction
0.01 ft	Cohesive	N/A	N/A	0.00 psf	0.00 Kips
1.99 ft	Cohesive	N/A	N/A	0.00 psf	0.00 Kips
2.01 ft	Cohesive	N/A	N/A	0.00 psf	0.00 Kips
3.48 ft	Cohesive	N/A	N/A	0.00 psf	0.00 Kips
3.49 ft	Cohesive	N/A	N/A	0.00 psf	0.00 Kips
3.99 ft	Cohesive	N/A	N/A	1038.00 psf	3.46 Kips
4.01 ft	Cohesive	N/A	N/A	1038.00 psf	3.60 Kips
5.99 ft	Cohesive	N/A	N/A	1038.00 psf	17.30 Kips
6.01 ft	Cohesive	N/A	N/A	950.00 psf	17.43 Kips
7.99 ft	Cohesive	N/A	N/A	950.00 psf	29.97 Kips
8.01 ft	Cohesionless	461.04 psf	28.07	N/A	30.06 Kips
12.99 ft	Cohesionless	579.56 psf	28.07	N/A	42.28 Kips
13.01 ft	Cohesionless	699.09 psf	29.96	N/A	42.34 Kips
22.01 ft	Cohesionless	958.29 psf	29.96	N/A	89.36 Kips
31.01 ft	Cohesionless	1217.49 psf	29.96	N/A	161.81 Kips
37.99 ft	Cohesionless	1418.51 psf	29.96	N/A	235.51 Kips
38.01 ft	Cohesionless	2139.14 psf	32.90	N/A	235.80 Kips
47.01 ft	Cohesionless	2443.34 psf	32.90	N/A	414.07 Kips
56.01 ft	Cohesionless	2747.54 psf	32.90	N/A	636.73 Kips
59.99 ft	Cohesionless	2882.06 psf	32.90	N/A	749.35 Kips

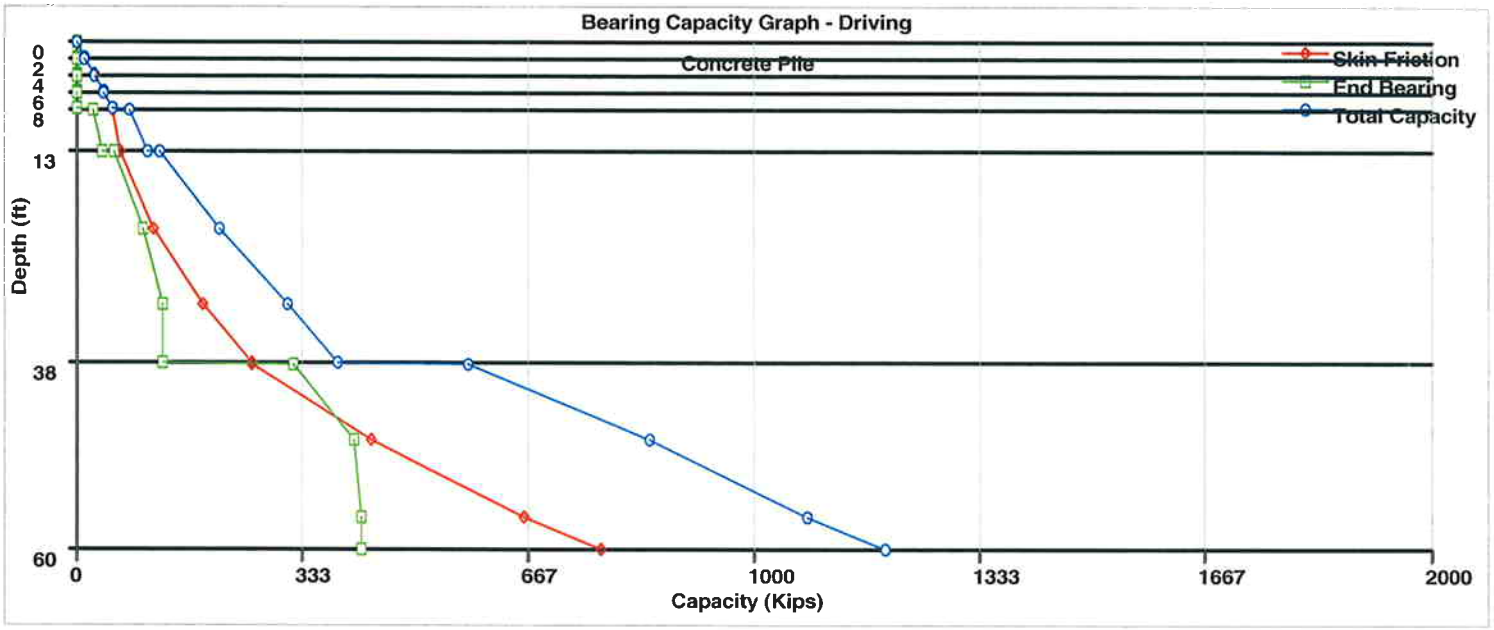
ULTIMATE - END BEARING

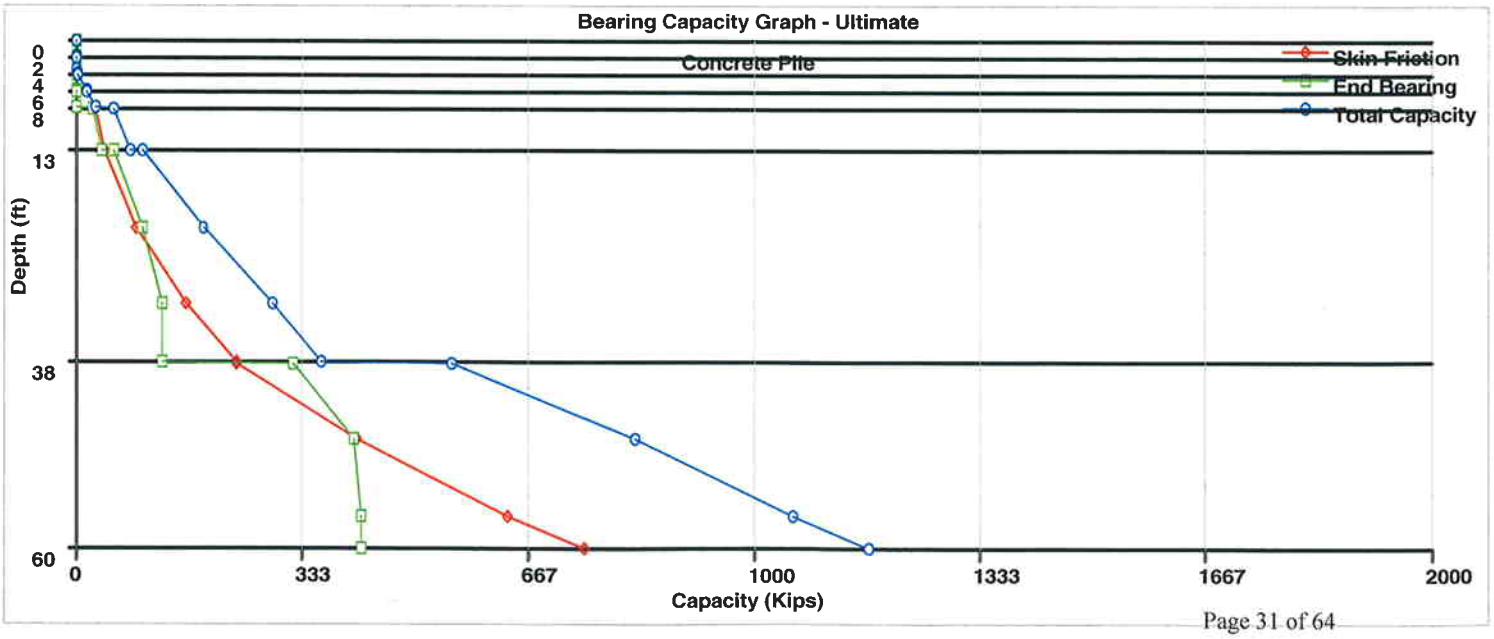
Depth	Soil Type	Effective Stress At Tip	Bearing Cap. Factor	Limiting End Bearing	End Bearing
0.01 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
1.99 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
2.01 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
3.48 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
3.49 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
3.99 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
4.01 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
5.99 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
6.01 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
7.99 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
8.01 ft	Cohesionless	461.28 psf	33.69	51.48 Kips	25.74 Kips
12.99 ft	Cohesionless	698.32 psf	33.69	51.48 Kips	38.96 Kips
13.01 ft	Cohesionless	699.38 psf	45.35	126.67 Kips	56.55 Kips
22.01 ft	Cohesionless	1217.78 psf	45.35	126.67 Kips	98.46 Kips
31.01 ft	Cohesionless	1736.18 psf	45.35	126.67 Kips	126.67 Kips
37.99 ft	Cohesionless	2138.22 psf	45.35	126.67 Kips	126.67 Kips
38.01 ft	Cohesionless	2139.48 psf	77.60	421.11 Kips	319.64 Kips
47.01 ft	Cohesionless	2747.88 psf	77.60	421.11 Kips	409.47 Kips
56.01 ft	Cohesionless	3356.28 psf	77.60	421.11 Kips	421.11 Kips
59.99 ft	Cohesionless	3625.32 psf	77.60	421.11 Kips	421.11 Kips

ULTIMATE - SUMMARY OF CAPACITIES

Depth	Skin Friction	End Bearing	Total Capacity
0.01 ft	0.00 Kips	0.00 Kips	0.00 Kips
1.99 ft	0.00 Kips	0.00 Kips	0.00 Kips
2.01 ft	0.00 Kips	0.00 Kips	0.00 Kips
3.48 ft	0.00 Kips	0.00 Kips	0.00 Kips
3.49 ft	0.00 Kips	0.00 Kips	0.00 Kips
3.99 ft	3.46 Kips	0.00 Kips	3.46 Kips
4.01 ft	3.60 Kips	0.00 Kips	3.60 Kips
5.99 ft	17.30 Kips	0.00 Kips	17.30 Kips
6.01 ft	17.43 Kips	0.00 Kips	17.43 Kips
7.99 ft	29.97 Kips	0.00 Kips	29.97 Kips
8.01 ft	30.06 Kips	25.74 Kips	55.79 Kips
12.99 ft	42.28 Kips	38.96 Kips	81.24 Kips
13.01 ft	42.34 Kips	56.55 Kips	98.89 Kips
22.01 ft	89.36 Kips	98.46 Kips	187.83 Kips
31.01 ft	161.81 Kips	126.67 Kips	288.48 Kips
37.99 ft	235.51 Kips	126.67 Kips	362.17 Kips
38.01 ft	235.80 Kips	319.64 Kips	555.44 Kips
47.01 ft	414.07 Kips	409.47 Kips	823.54 Kips
56.01 ft	636.73 Kips	421.11 Kips	1057.84 Kips
59.99 ft	749.35 Kips	421.11 Kips	1170.46 Kips


Bearing Capacity Graph - Restrike
Concrete Pile
Skin Friction
End Bearing
Total Capacity
Depth (ft)
0
2
4
6
8
13
38
60
0
333
667
1000
1333
1667
2000
Capacity (Kips)


Bearing Capacity Graph - Driving
Concrete Pile
Skin Friction
End Bearing
Total Capacity
Depth (ft)
0
2
4
6
8
13
38
60
0
333
667
1000
1333
1667
2000
Capacity (Kips)


Bearing Capacity Graph - Ultimate
Concrete Pile
Skin Friction
End Bearing
Total Capacity
Depth (ft)
0
2
4
6
8
13
38
60
0
333
667
1000
1333
1667
2000
Capacity (Kips)

DRIVEN 1.0

GENERAL PROJECT INFORMATION

Filename: C:\DOCUME~1\AWIJAYA\DESKTOP\DRIVEN\ALTAMA~1\BENT30~1.DVN
Project Name: Altamaha River - BENT 30 Project Date: 06/18/2012
Project Client: Heath _Lineback
Computed By: AW
Project Manager: SS

PILE INFORMATION

Pile Type: Concrete Pile
Top of Pile: 0.00 ft
Length of Square Side: 20.00 in

ULTIMATE CONSIDERATIONS

Water Table Depth At Time Of:	- Drilling:	7.30 ft
	- Driving/Restrike	0.00 ft
	- Ultimate:	-21.00 ft
Ultimate Considerations:	- Local Scour:	3.49 ft
	- Long Term Scour:	0.00 ft
	- Soft Soil:	0.00 ft

ULTIMATE PROFILE

Layer	Type	Thickness	Driving Loss	Unit Weight	Strength	Ultimate Curve
1	Cohesive	2.00 ft	0.00%	110.00 pcf	0.00 psf	User Def.
2	Cohesive	2.00 ft	0.00%	120.00 pcf	0.00 psf	User Def.
3	Cohesive	2.00 ft	0.00%	120.00 pcf	0.00 psf	User Def.
4	Cohesionless	2.00 ft	0.00%	110.00 pcf	28.6/28.6	Nordlund
5	Cohesive	5.00 ft	0.00%	110.00 pcf	0.00 psf	User Def.
6	Cohesionless	5.00 ft	0.00%	120.00 pcf	33.5/33.5	Nordlund
7	Cohesionless	5.00 ft	0.00%	110.00 pcf	30.2/30.2	Nordlund
8	Cohesionless	20.00 ft	0.00%	120.00 pcf	32.2/32.2	Nordlund
9	Cohesionless	17.00 ft	0.00%	130.00 pcf	36.0/36.0	Nordlund

RESTRIKE - SKIN FRICTION

Depth	Soil Type	Effective Stress At Midpoint	Sliding Friction Angle	Adhesion	Skin Friction
0.01 ft	Cohesive	N/A	N/A	950.00 psf	0.06 Kips
1.99 ft	Cohesive	N/A	N/A	950.00 psf	12.60 Kips
2.01 ft	Cohesive	N/A	N/A	950.00 psf	12.73 Kips
3.99 ft	Cohesive	N/A	N/A	950.00 psf	25.27 Kips
4.01 ft	Cohesive	N/A	N/A	900.00 psf	25.39 Kips
5.99 ft	Cohesive	N/A	N/A	900.00 psf	37.27 Kips
6.01 ft	Cohesionless	325.84 psf	26.15	N/A	37.34 Kips
7.99 ft	Cohesionless	372.96 psf	26.15	N/A	39.85 Kips
8.01 ft	Cohesive	N/A	N/A	250.00 psf	39.88 Kips
12.99 ft	Cohesive	N/A	N/A	250.00 psf	48.18 Kips
13.01 ft	Cohesionless	659.09 psf	30.65	N/A	48.23 Kips
17.99 ft	Cohesionless	802.51 psf	30.65	N/A	71.88 Kips
18.01 ft	Cohesionless	947.04 psf	27.64	N/A	71.97 Kips
22.99 ft	Cohesionless	1065.56 psf	27.64	N/A	93.04 Kips
23.01 ft	Cohesionless	1185.09 psf	29.48	N/A	93.15 Kips
32.01 ft	Cohesionless	1444.29 psf	29.48	N/A	159.84 Kips
41.01 ft	Cohesionless	1703.49 psf	29.48	N/A	250.46 Kips
42.99 ft	Cohesionless	1760.51 psf	29.48	N/A	273.60 Kips
43.01 ft	Cohesionless	2337.14 psf	32.90	N/A	273.91 Kips
52.01 ft	Cohesionless	2641.34 psf	32.90	N/A	466.63 Kips
59.99 ft	Cohesionless	2911.06 psf	32.90	N/A	674.63 Kips

RESTRIKE - END BEARING

Depth	Soil Type	Effective Stress At Tip	Bearing Cap. Factor	Limiting End Bearing	End Bearing
0.01 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
1.99 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
2.01 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
3.99 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
4.01 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
5.99 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
6.01 ft	Cohesionless	326.08 psf	25.00	37.00 Kips	12.44 Kips
7.99 ft	Cohesionless	420.32 psf	25.00	37.00 Kips	16.03 Kips
8.01 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
12.99 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
13.01 ft	Cohesionless	659.38 psf	51.65	168.33 Kips	61.94 Kips
17.99 ft	Cohesionless	946.22 psf	51.65	168.33 Kips	88.89 Kips
18.01 ft	Cohesionless	947.28 psf	31.25	41.90 Kips	41.90 Kips
22.99 ft	Cohesionless	1184.32 psf	31.25	41.90 Kips	41.90 Kips
23.01 ft	Cohesionless	1185.38 psf	41.70	101.39 Kips	86.68 Kips
32.01 ft	Cohesionless	1703.78 psf	41.70	101.39 Kips	101.39 Kips
41.01 ft	Cohesionless	2222.18 psf	41.70	101.39 Kips	101.39 Kips
42.99 ft	Cohesionless	2336.22 psf	41.70	101.39 Kips	101.39 Kips
43.01 ft	Cohesionless	2337.48 psf	77.60	421.11 Kips	348.36 Kips
52.01 ft	Cohesionless	2945.88 psf	77.60	421.11 Kips	421.11 Kips
59.99 ft	Cohesionless	3485.32 psf	77.60	421.11 Kips	421.11 Kips

RESTRIKE - SUMMARY OF CAPACITIES

Depth	Skin Friction	End Bearing	Total Capacity
0.01 ft	0.06 Kips	0.00 Kips	0.06 Kips
1.99 ft	12.60 Kips	0.00 Kips	12.60 Kips
2.01 ft	12.73 Kips	0.00 Kips	12.73 Kips
3.99 ft	25.27 Kips	0.00 Kips	25.27 Kips
4.01 ft	25.39 Kips	0.00 Kips	25.39 Kips
5.99 ft	37.27 Kips	0.00 Kips	37.27 Kips
6.01 ft	37.34 Kips	12.44 Kips	49.78 Kips
7.99 ft	39.85 Kips	16.03 Kips	55.88 Kips
8.01 ft	39.88 Kips	0.00 Kips	39.88 Kips
12.99 ft	48.18 Kips	0.00 Kips	48.18 Kips
13.01 ft	48.23 Kips	61.94 Kips	110.17 Kips
17.99 ft	71.88 Kips	88.89 Kips	160.77 Kips
18.01 ft	71.97 Kips	41.90 Kips	113.87 Kips
22.99 ft	93.04 Kips	41.90 Kips	134.94 Kips
23.01 ft	93.15 Kips	86.68 Kips	179.83 Kips
32.01 ft	159.84 Kips	101.39 Kips	261.23 Kips
41.01 ft	250.46 Kips	101.39 Kips	351.85 Kips
42.99 ft	273.60 Kips	101.39 Kips	374.99 Kips
43.01 ft	273.91 Kips	348.36 Kips	622.28 Kips
52.01 ft	466.63 Kips	421.11 Kips	887.74 Kips
59.99 ft	674.63 Kips	421.11 Kips	1095.74 Kips

DRIVING - SKIN FRICTION

Depth	Soil Type	Effective Stress At Midpoint	Sliding Friction Angle	Adhesion	Skin Friction
0.01 ft	Cohesive	N/A	N/A	950.00 psf	0.06 Kips
1.99 ft	Cohesive	N/A	N/A	950.00 psf	12.60 Kips
2.01 ft	Cohesive	N/A	N/A	950.00 psf	12.73 Kips
3.99 ft	Cohesive	N/A	N/A	950.00 psf	25.27 Kips
4.01 ft	Cohesive	N/A	N/A	900.00 psf	25.39 Kips
5.99 ft	Cohesive	N/A	N/A	900.00 psf	37.27 Kips
6.01 ft	Cohesionless	325.84 psf	26.15	N/A	37.34 Kips
7.99 ft	Cohesionless	372.96 psf	26.15	N/A	39.85 Kips
8.01 ft	Cohesive	N/A	N/A	250.00 psf	39.88 Kips
12.99 ft	Cohesive	N/A	N/A	250.00 psf	48.18 Kips
13.01 ft	Cohesionless	659.09 psf	30.65	N/A	48.23 Kips
17.99 ft	Cohesionless	802.51 psf	30.65	N/A	71.88 Kips
18.01 ft	Cohesionless	947.04 psf	27.64	N/A	71.97 Kips
22.99 ft	Cohesionless	1065.56 psf	27.64	N/A	93.04 Kips
23.01 ft	Cohesionless	1185.09 psf	29.48	N/A	93.15 Kips
32.01 ft	Cohesionless	1444.29 psf	29.48	N/A	159.84 Kips
41.01 ft	Cohesionless	1703.49 psf	29.48	N/A	250.46 Kips
42.99 ft	Cohesionless	1760.51 psf	29.48	N/A	273.60 Kips
43.01 ft	Cohesionless	2337.14 psf	32.90	N/A	273.91 Kips
52.01 ft	Cohesionless	2641.34 psf	32.90	N/A	466.63 Kips
59.99 ft	Cohesionless	2911.06 psf	32.90	N/A	674.63 Kips

DRIVING - END BEARING

Depth	Soil Type	Effective Stress At Tip	Bearing Cap. Factor	Limiting End Bearing	End Bearing
0.01 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
1.99 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
2.01 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
3.99 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
4.01 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
5.99 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
6.01 ft	Cohesionless	326.08 psf	25.00	37.00 Kips	12.44 Kips
7.99 ft	Cohesionless	420.32 psf	25.00	37.00 Kips	16.03 Kips
8.01 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
12.99 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
13.01 ft	Cohesionless	659.38 psf	51.65	168.33 Kips	61.94 Kips
17.99 ft	Cohesionless	946.22 psf	51.65	168.33 Kips	88.89 Kips
18.01 ft	Cohesionless	947.28 psf	31.25	41.90 Kips	41.90 Kips
22.99 ft	Cohesionless	1184.32 psf	31.25	41.90 Kips	41.90 Kips
23.01 ft	Cohesionless	1185.38 psf	41.70	101.39 Kips	86.68 Kips
32.01 ft	Cohesionless	1703.78 psf	41.70	101.39 Kips	101.39 Kips
41.01 ft	Cohesionless	2222.18 psf	41.70	101.39 Kips	101.39 Kips
42.99 ft	Cohesionless	2336.22 psf	41.70	101.39 Kips	101.39 Kips
43.01 ft	Cohesionless	2337.48 psf	77.60	421.11 Kips	348.36 Kips
52.01 ft	Cohesionless	2945.88 psf	77.60	421.11 Kips	421.11 Kips
59.99 ft	Cohesionless	3485.32 psf	77.60	421.11 Kips	421.11 Kips

DRIVING - SUMMARY OF CAPACITIES

Depth	Skin Friction	End Bearing	Total Capacity
0.01 ft	0.06 Kips	0.00 Kips	0.06 Kips
1.99 ft	12.60 Kips	0.00 Kips	12.60 Kips
2.01 ft	12.73 Kips	0.00 Kips	12.73 Kips
3.99 ft	25.27 Kips	0.00 Kips	25.27 Kips
4.01 ft	25.39 Kips	0.00 Kips	25.39 Kips
5.99 ft	37.27 Kips	0.00 Kips	37.27 Kips
6.01 ft	37.34 Kips	12.44 Kips	49.78 Kips
7.99 ft	39.85 Kips	16.03 Kips	55.88 Kips
8.01 ft	39.88 Kips	0.00 Kips	39.88 Kips
12.99 ft	48.18 Kips	0.00 Kips	48.18 Kips
13.01 ft	48.23 Kips	61.94 Kips	110.17 Kips
17.99 ft	71.88 Kips	88.89 Kips	160.77 Kips
18.01 ft	71.97 Kips	41.90 Kips	113.87 Kips
22.99 ft	93.04 Kips	41.90 Kips	134.94 Kips
23.01 ft	93.15 Kips	86.68 Kips	179.83 Kips
32.01 ft	159.84 Kips	101.39 Kips	261.23 Kips
41.01 ft	250.46 Kips	101.39 Kips	351.85 Kips
42.99 ft	273.60 Kips	101.39 Kips	374.99 Kips
43.01 ft	273.91 Kips	348.36 Kips	622.28 Kips
52.01 ft	466.63 Kips	421.11 Kips	887.74 Kips
59.99 ft	674.63 Kips	421.11 Kips	1095.74 Kips

ULTIMATE - SKIN FRICTION

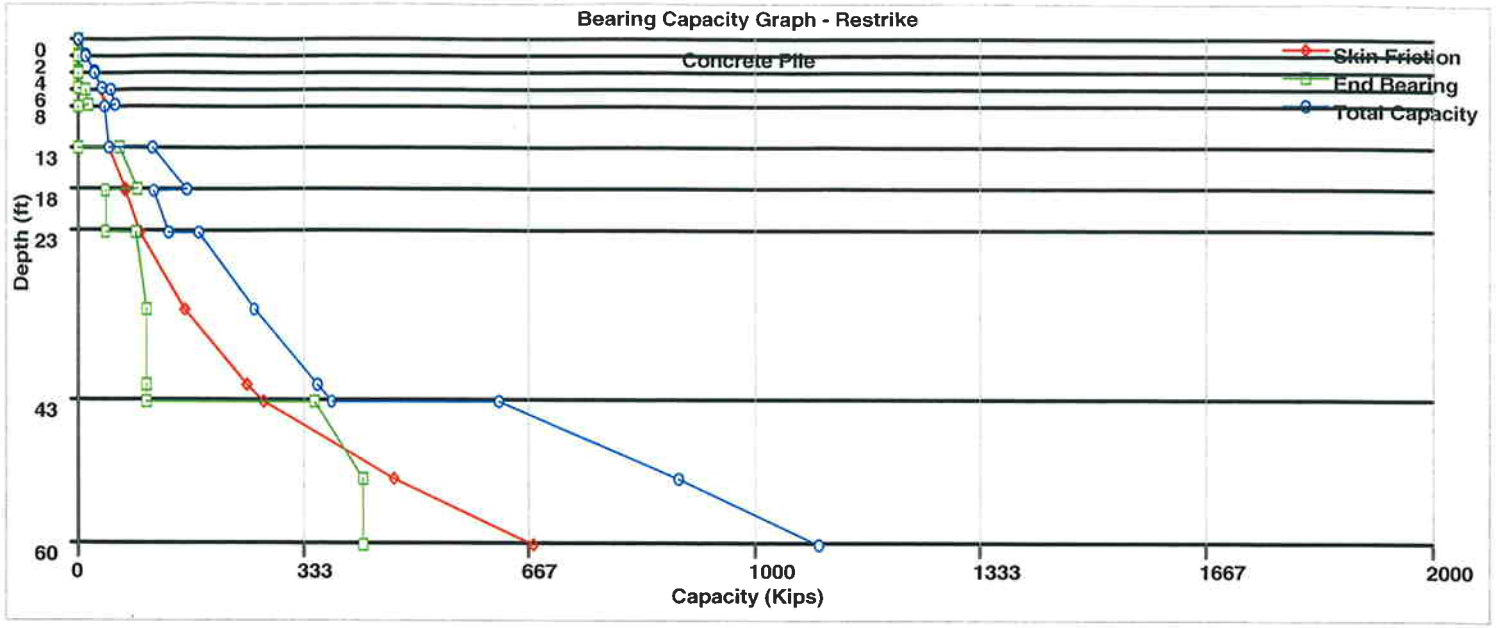
Depth	Soil Type	Effective Stress At Midpoint	Sliding Friction Angle	Adhesion	Skin Friction
0.01 ft	Cohesive	N/A	N/A	0.00 psf	0.00 Kips
1.99 ft	Cohesive	N/A	N/A	0.00 psf	0.00 Kips
2.01 ft	Cohesive	N/A	N/A	0.00 psf	0.00 Kips
3.48 ft	Cohesive	N/A	N/A	0.00 psf	0.00 Kips
3.49 ft	Cohesive	N/A	N/A	0.00 psf	0.00 Kips
3.99 ft	Cohesive	N/A	N/A	950.00 psf	3.17 Kips
4.01 ft	Cohesive	N/A	N/A	900.00 psf	3.29 Kips
5.99 ft	Cohesive	N/A	N/A	900.00 psf	15.17 Kips
6.01 ft	Cohesionless	325.84 psf	26.15	N/A	15.24 Kips
7.99 ft	Cohesionless	372.96 psf	26.15	N/A	17.74 Kips
8.01 ft	Cohesive	N/A	N/A	250.00 psf	17.77 Kips
12.99 ft	Cohesive	N/A	N/A	250.00 psf	26.07 Kips
13.01 ft	Cohesionless	659.09 psf	30.65	N/A	26.13 Kips
17.99 ft	Cohesionless	802.51 psf	30.65	N/A	49.78 Kips
18.01 ft	Cohesionless	947.04 psf	27.64	N/A	49.87 Kips
22.99 ft	Cohesionless	1065.56 psf	27.64	N/A	70.94 Kips
23.01 ft	Cohesionless	1185.09 psf	29.48	N/A	71.05 Kips
32.01 ft	Cohesionless	1444.29 psf	29.48	N/A	137.74 Kips
41.01 ft	Cohesionless	1703.49 psf	29.48	N/A	228.35 Kips
42.99 ft	Cohesionless	1760.51 psf	29.48	N/A	251.50 Kips
43.01 ft	Cohesionless	2337.14 psf	32.90	N/A	251.81 Kips
52.01 ft	Cohesionless	2641.34 psf	32.90	N/A	444.53 Kips
59.99 ft	Cohesionless	2911.06 psf	32.90	N/A	652.53 Kips

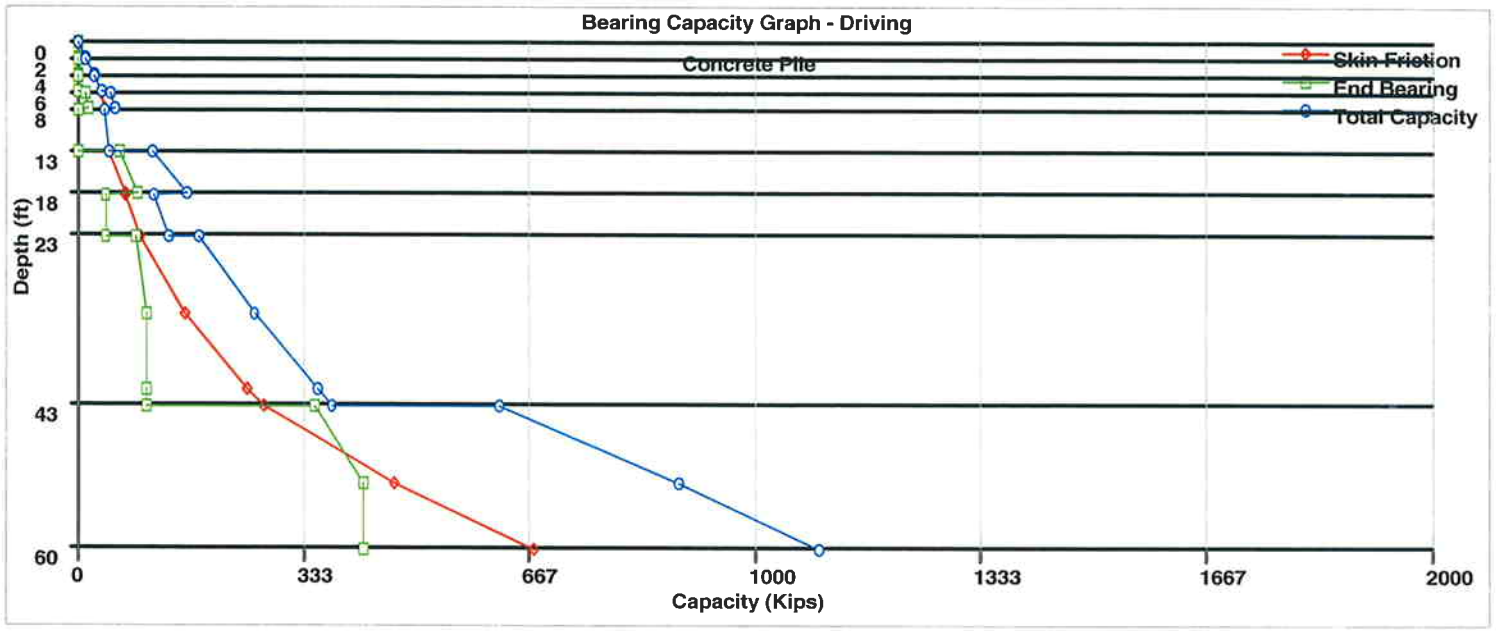
ULTIMATE - END BEARING

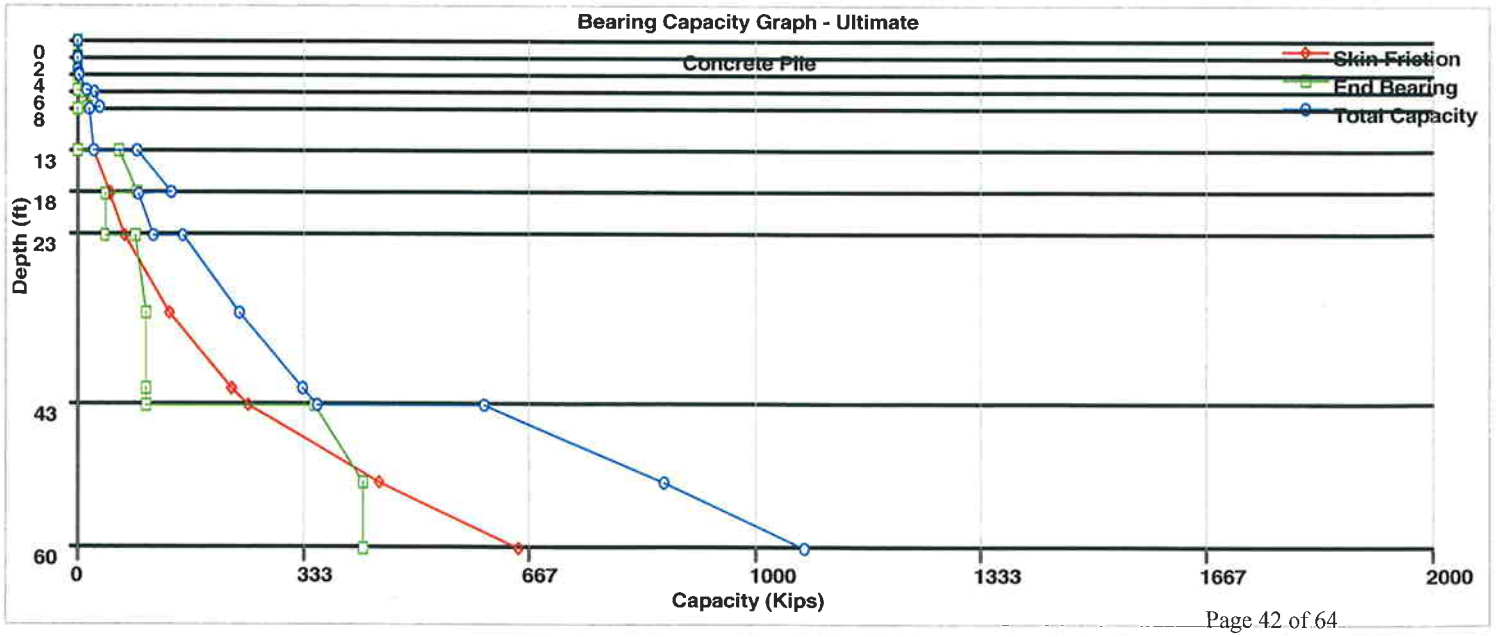
Depth	Soil Type	Effective Stress At Tip	Bearing Cap. Factor	Limiting End Bearing	End Bearing
0.01 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
1.99 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
2.01 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
3.48 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
3.49 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
3.99 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
4.01 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
5.99 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
6.01 ft	Cohesionless	326.08 psf	25.00	37.00 Kips	12.44 Kips
7.99 ft	Cohesionless	420.32 psf	25.00	37.00 Kips	16.03 Kips
8.01 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
12.99 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
13.01 ft	Cohesionless	659.38 psf	51.65	168.33 Kips	61.94 Kips
17.99 ft	Cohesionless	946.22 psf	51.65	168.33 Kips	88.89 Kips
18.01 ft	Cohesionless	947.28 psf	31.25	41.90 Kips	41.90 Kips
22.99 ft	Cohesionless	1184.32 psf	31.25	41.90 Kips	41.90 Kips
23.01 ft	Cohesionless	1185.38 psf	41.70	101.39 Kips	86.68 Kips
32.01 ft	Cohesionless	1703.78 psf	41.70	101.39 Kips	101.39 Kips
41.01 ft	Cohesionless	2222.18 psf	41.70	101.39 Kips	101.39 Kips
42.99 ft	Cohesionless	2336.22 psf	41.70	101.39 Kips	101.39 Kips
43.01 ft	Cohesionless	2337.48 psf	77.60	421.11 Kips	348.72 Kips
52.01 ft	Cohesionless	2945.88 psf	77.60	421.11 Kips	421.11 Kips
59.99 ft	Cohesionless	3485.32 psf	77.60	421.11 Kips	421.11 Kips

ULTIMATE - SUMMARY OF CAPACITIES

Depth	Skin Friction	End Bearing	Total Capacity
0.01 ft	0.00 Kips	0.00 Kips	0.00 Kips
1.99 ft	0.00 Kips	0.00 Kips	0.00 Kips
2.01 ft	0.00 Kips	0.00 Kips	0.00 Kips
3.48 ft	0.00 Kips	0.00 Kips	0.00 Kips
3.49 ft	0.00 Kips	0.00 Kips	0.00 Kips
3.99 ft	3.17 Kips	0.00 Kips	3.17 Kips
4.01 ft	3.29 Kips	0.00 Kips	3.29 Kips
5.99 ft	15.17 Kips	0.00 Kips	15.17 Kips
6.01 ft	15.24 Kips	12.44 Kips	27.68 Kips
7.99 ft	17.74 Kips	16.03 Kips	33.78 Kips
8.01 ft	17.77 Kips	0.00 Kips	17.77 Kips
12.99 ft	26.07 Kips	0.00 Kips	26.07 Kips
13.01 ft	26.13 Kips	61.94 Kips	88.07 Kips
17.99 ft	49.78 Kips	88.89 Kips	138.66 Kips
18.01 ft	49.87 Kips	41.90 Kips	91.77 Kips
22.99 ft	70.94 Kips	41.90 Kips	112.84 Kips
23.01 ft	71.05 Kips	86.68 Kips	157.73 Kips
32.01 ft	137.74 Kips	101.39 Kips	239.12 Kips
41.01 ft	228.35 Kips	101.39 Kips	329.74 Kips
42.99 ft	251.50 Kips	101.39 Kips	352.89 Kips
43.01 ft	251.81 Kips	348.72 Kips	600.53 Kips
52.01 ft	444.53 Kips	421.11 Kips	865.64 Kips
59.99 ft	652.53 Kips	421.11 Kips	1073.64 Kips


Bearing Capacity Graph - Restrike
Concrete Pile
Skin Friction
End Bearing
Total Capacity
Depth (ft)
0
2
4
6
8
13
18
23
43
60
0
333
667
1000
1333
1667
2000
Capacity (Kips)


Bearing Capacity Graph - Driving
Concrete Pile
Skin Friction
End Bearing
Total Capacity
Depth (ft)
0
2
4
6
8
13
18
23
43
60
0
333
667
1000
1333
1667
2000
Capacity (Kips)


Bearing Capacity Graph - Ultimate
Concrete Pile
Skin Friction
End Bearing
Total Capacity
Depth (ft)
0
2
4
6
8
13
18
23
43
60
0
333
667
1000
1333
1667
2000
Capacity (Kips)

DRIVEN 1.0

GENERAL PROJECT INFORMATION

Filename: C:\DOCUME~1\AWIJAYA\DESKTOP\DRIVEN\ALTAMA~1\BENT52~1.DVN
Project Name: Altamaha River - BENT 52 Project Date: 06/13/2012
Project Client: Heath Lineback
Computed By: SRF
Project Manager: SS

PILE INFORMATION

Pile Type: Concrete Pile
Top of Pile: 0.00 ft
Length of Square Side: 20.00 in

ULTIMATE CONSIDERATIONS

Water Table Depth At Time Of:	- Drilling:	8.00 ft
	- Driving/Restrike	0.00 ft
	- Ultimate:	-19.00 ft
Ultimate Considerations:	- Local Scour:	3.49 ft
	- Long Term Scour:	0.00 ft
	- Soft Soil:	0.00 ft

ULTIMATE PROFILE

Layer	Type	Thickness	Driving Loss	Unit Weight	Strength	Ultimate Curve
1	Cohesionless	2.00 ft	0.00%	110.00 pcf	30.2/30.2	Nordlund
2	Cohesionless	16.00 ft	0.00%	120.00 pcf	34.6/34.6	Nordlund
3	Cohesionless	10.00 ft	0.00%	120.00 pcf	30.6/30.6	Nordlund
4	Cohesionless	5.00 ft	0.00%	130.00 pcf	36.0/36.0	Nordlund
5	Cohesionless	10.00 ft	0.00%	120.00 pcf	31.4/31.4	Nordlund
6	Cohesionless	10.00 ft	0.00%	130.00 pcf	34.4/34.4	Nordlund
7	Cohesionless	10.00 ft	0.00%	130.00 pcf	36.0/36.0	Nordlund
8	Cohesionless	5.00 ft	0.00%	120.00 pcf	32.3/32.3	Nordlund
9	Cohesionless	7.00 ft	0.00%	130.00 pcf	36.0/36.0	Nordlund

RESTRIKE - SKIN FRICTION

Depth	Soil Type	Effective Stress At Midpoint	Sliding Friction Angle	Adhesion	Skin Friction
0.01 ft	Cohesionless	0.24 psf	27.58	N/A	0.00 Kips
1.99 ft	Cohesionless	47.36 psf	27.58	N/A	0.37 Kips
2.01 ft	Cohesionless	95.49 psf	31.61	N/A	0.38 Kips
11.01 ft	Cohesionless	354.69 psf	31.61	N/A	21.43 Kips
17.99 ft	Cohesionless	555.71 psf	31.61	N/A	58.93 Kips
18.01 ft	Cohesionless	1017.09 psf	27.95	N/A	59.04 Kips
27.01 ft	Cohesionless	1276.29 psf	27.95	N/A	106.81 Kips
27.99 ft	Cohesionless	1304.51 psf	27.95	N/A	113.18 Kips
28.01 ft	Cohesionless	1593.14 psf	32.95	N/A	113.38 Kips
32.99 ft	Cohesionless	1761.46 psf	32.95	N/A	185.02 Kips
33.01 ft	Cohesionless	1931.09 psf	28.69	N/A	185.26 Kips
42.01 ft	Cohesionless	2190.29 psf	28.69	N/A	276.43 Kips
42.99 ft	Cohesionless	2218.51 psf	28.69	N/A	287.66 Kips
43.01 ft	Cohesionless	2507.14 psf	31.48	N/A	287.94 Kips
52.01 ft	Cohesionless	2811.34 psf	31.48	N/A	452.31 Kips
52.99 ft	Cohesionless	2844.46 psf	31.48	N/A	472.35 Kips
53.01 ft	Cohesionless	3183.14 psf	32.90	N/A	472.82 Kips
62.01 ft	Cohesionless	3487.34 psf	32.90	N/A	727.25 Kips
62.99 ft	Cohesionless	3520.46 psf	32.90	N/A	757.64 Kips
63.01 ft	Cohesionless	3859.09 psf	29.56	N/A	758.15 Kips
67.99 ft	Cohesionless	4002.51 psf	29.56	N/A	861.47 Kips
68.01 ft	Cohesionless	4147.14 psf	32.90	N/A	862.02 Kips
74.99 ft	Cohesionless	4383.06 psf	32.90	N/A	1110.03 Kips

RESTRIKE - END BEARING

Depth	Soil Type	Effective Stress At Tip	Bearing Cap. Factor	Limiting End Bearing	End Bearing
0.01 ft	Cohesionless	0.48 psf	30.94	40.68 Kips	0.02 Kips
1.99 ft	Cohesionless	94.72 psf	30.94	40.68 Kips	4.75 Kips
2.01 ft	Cohesionless	95.78 psf	60.52	259.67 Kips	10.83 Kips
11.01 ft	Cohesionless	614.18 psf	60.52	259.67 Kips	69.47 Kips
17.99 ft	Cohesionless	1016.22 psf	60.52	259.67 Kips	114.95 Kips
18.01 ft	Cohesionless	1017.38 psf	33.00	48.78 Kips	48.78 Kips
27.01 ft	Cohesionless	1535.78 psf	33.00	48.78 Kips	48.78 Kips
27.99 ft	Cohesionless	1592.22 psf	33.00	48.78 Kips	48.78 Kips
28.01 ft	Cohesionless	1593.48 psf	78.23	426.79 Kips	240.30 Kips
32.99 ft	Cohesionless	1930.12 psf	78.23	426.79 Kips	291.07 Kips
33.01 ft	Cohesionless	1931.38 psf	37.25	68.10 Kips	68.10 Kips
42.01 ft	Cohesionless	2449.78 psf	37.25	68.10 Kips	68.10 Kips
42.99 ft	Cohesionless	2506.22 psf	37.25	68.10 Kips	68.10 Kips
43.01 ft	Cohesionless	2507.48 psf	59.30	245.97 Kips	245.97 Kips
52.01 ft	Cohesionless	3115.88 psf	59.30	245.97 Kips	245.97 Kips
52.99 ft	Cohesionless	3182.12 psf	59.30	245.97 Kips	245.97 Kips
53.01 ft	Cohesionless	3183.48 psf	77.60	421.11 Kips	421.11 Kips
62.01 ft	Cohesionless	3791.88 psf	77.60	421.11 Kips	421.11 Kips
62.99 ft	Cohesionless	3858.12 psf	77.60	421.11 Kips	421.11 Kips
63.01 ft	Cohesionless	3859.38 psf	42.17	104.87 Kips	104.87 Kips
67.99 ft	Cohesionless	4146.22 psf	42.17	104.87 Kips	104.87 Kips
68.01 ft	Cohesionless	4147.48 psf	77.60	421.11 Kips	421.11 Kips
74.99 ft	Cohesionless	4619.32 psf	77.60	421.11 Kips	421.11 Kips

RESTRIKE - SUMMARY OF CAPACITIES

Depth	Skin Friction	End Bearing	Total Capacity
0.01 ft	0.00 Kips	0.02 Kips	0.02 Kips
1.99 ft	0.37 Kips	4.75 Kips	5.13 Kips
2.01 ft	0.38 Kips	10.83 Kips	11.22 Kips
11.01 ft	21.43 Kips	69.47 Kips	90.91 Kips
17.99 ft	58.93 Kips	114.95 Kips	173.88 Kips
18.01 ft	59.04 Kips	48.78 Kips	107.82 Kips
27.01 ft	106.81 Kips	48.78 Kips	155.59 Kips
27.99 ft	113.18 Kips	48.78 Kips	161.96 Kips
28.01 ft	113.38 Kips	240.30 Kips	353.68 Kips
32.99 ft	185.02 Kips	291.07 Kips	476.08 Kips
33.01 ft	185.26 Kips	68.10 Kips	253.36 Kips
42.01 ft	276.43 Kips	68.10 Kips	344.53 Kips
42.99 ft	287.66 Kips	68.10 Kips	355.76 Kips
43.01 ft	287.94 Kips	245.97 Kips	533.91 Kips
52.01 ft	452.31 Kips	245.97 Kips	698.28 Kips
52.99 ft	472.35 Kips	245.97 Kips	718.33 Kips
53.01 ft	472.82 Kips	421.11 Kips	893.93 Kips
62.01 ft	727.25 Kips	421.11 Kips	1148.37 Kips
62.99 ft	757.64 Kips	421.11 Kips	1178.75 Kips
63.01 ft	758.15 Kips	104.87 Kips	863.02 Kips
67.99 ft	861.47 Kips	104.87 Kips	966.34 Kips
68.01 ft	862.02 Kips	421.11 Kips	1283.13 Kips
74.99 ft	1110.03 Kips	421.11 Kips	1531.14 Kips

DRIVING - SKIN FRICTION

Depth	Soil Type	Effective Stress At Midpoint	Sliding Friction Angle	Adhesion	Skin Friction
0.01 ft	Cohesionless	0.24 psf	27.58	N/A	0.00 Kips
1.99 ft	Cohesionless	47.36 psf	27.58	N/A	0.37 Kips
2.01 ft	Cohesionless	95.49 psf	31.61	N/A	0.38 Kips
11.01 ft	Cohesionless	354.69 psf	31.61	N/A	21.43 Kips
17.99 ft	Cohesionless	555.71 psf	31.61	N/A	58.93 Kips
18.01 ft	Cohesionless	1017.09 psf	27.95	N/A	59.04 Kips
27.01 ft	Cohesionless	1276.29 psf	27.95	N/A	106.81 Kips
27.99 ft	Cohesionless	1304.51 psf	27.95	N/A	113.18 Kips
28.01 ft	Cohesionless	1593.14 psf	32.95	N/A	113.38 Kips
32.99 ft	Cohesionless	1761.46 psf	32.95	N/A	185.02 Kips
33.01 ft	Cohesionless	1931.09 psf	28.69	N/A	185.26 Kips
42.01 ft	Cohesionless	2190.29 psf	28.69	N/A	276.43 Kips
42.99 ft	Cohesionless	2218.51 psf	28.69	N/A	287.66 Kips
43.01 ft	Cohesionless	2507.14 psf	31.48	N/A	287.94 Kips
52.01 ft	Cohesionless	2811.34 psf	31.48	N/A	452.31 Kips
52.99 ft	Cohesionless	2844.46 psf	31.48	N/A	472.35 Kips
53.01 ft	Cohesionless	3183.14 psf	32.90	N/A	472.82 Kips
62.01 ft	Cohesionless	3487.34 psf	32.90	N/A	727.25 Kips
62.99 ft	Cohesionless	3520.46 psf	32.90	N/A	757.64 Kips
63.01 ft	Cohesionless	3859.09 psf	29.56	N/A	758.15 Kips
67.99 ft	Cohesionless	4002.51 psf	29.56	N/A	861.47 Kips
68.01 ft	Cohesionless	4147.14 psf	32.90	N/A	862.02 Kips
74.99 ft	Cohesionless	4383.06 psf	32.90	N/A	1110.03 Kips

DRIVING - END BEARING

Depth	Soil Type	Effective Stress At Tip	Bearing Cap. Factor	Limiting End Bearing	End Bearing
0.01 ft	Cohesionless	0.48 psf	30.94	40.68 Kips	0.02 Kips
1.99 ft	Cohesionless	94.72 psf	30.94	40.68 Kips	4.75 Kips
2.01 ft	Cohesionless	95.78 psf	60.52	259.67 Kips	10.83 Kips
11.01 ft	Cohesionless	614.18 psf	60.52	259.67 Kips	69.47 Kips
17.99 ft	Cohesionless	1016.22 psf	60.52	259.67 Kips	114.95 Kips
18.01 ft	Cohesionless	1017.38 psf	33.00	48.78 Kips	48.78 Kips
27.01 ft	Cohesionless	1535.78 psf	33.00	48.78 Kips	48.78 Kips
27.99 ft	Cohesionless	1592.22 psf	33.00	48.78 Kips	48.78 Kips
28.01 ft	Cohesionless	1593.48 psf	78.23	426.79 Kips	240.30 Kips
32.99 ft	Cohesionless	1930.12 psf	78.23	426.79 Kips	291.07 Kips
33.01 ft	Cohesionless	1931.38 psf	37.25	68.10 Kips	68.10 Kips
42.01 ft	Cohesionless	2449.78 psf	37.25	68.10 Kips	68.10 Kips
42.99 ft	Cohesionless	2506.22 psf	37.25	68.10 Kips	68.10 Kips
43.01 ft	Cohesionless	2507.48 psf	59.30	245.97 Kips	245.97 Kips
52.01 ft	Cohesionless	3115.88 psf	59.30	245.97 Kips	245.97 Kips
52.99 ft	Cohesionless	3182.12 psf	59.30	245.97 Kips	245.97 Kips
53.01 ft	Cohesionless	3183.48 psf	77.60	421.11 Kips	421.11 Kips
62.01 ft	Cohesionless	3791.88 psf	77.60	421.11 Kips	421.11 Kips
62.99 ft	Cohesionless	3858.12 psf	77.60	421.11 Kips	421.11 Kips
63.01 ft	Cohesionless	3859.38 psf	42.17	104.87 Kips	104.87 Kips
67.99 ft	Cohesionless	4146.22 psf	42.17	104.87 Kips	104.87 Kips
68.01 ft	Cohesionless	4147.48 psf	77.60	421.11 Kips	421.11 Kips
74.99 ft	Cohesionless	4619.32 psf	77.60	421.11 Kips	421.11 Kips

DRIVING - SUMMARY OF CAPACITIES

Depth	Skin Friction	End Bearing	Total Capacity
0.01 ft	0.00 Kips	0.02 Kips	0.02 Kips
1.99 ft	0.37 Kips	4.75 Kips	5.13 Kips
2.01 ft	0.38 Kips	10.83 Kips	11.22 Kips
11.01 ft	21.43 Kips	69.47 Kips	90.91 Kips
17.99 ft	58.93 Kips	114.95 Kips	173.88 Kips
18.01 ft	59.04 Kips	48.78 Kips	107.82 Kips
27.01 ft	106.81 Kips	48.78 Kips	155.59 Kips
27.99 ft	113.18 Kips	48.78 Kips	161.96 Kips
28.01 ft	113.38 Kips	240.30 Kips	353.68 Kips
32.99 ft	185.02 Kips	291.07 Kips	476.08 Kips
33.01 ft	185.26 Kips	68.10 Kips	253.36 Kips
42.01 ft	276.43 Kips	68.10 Kips	344.53 Kips
42.99 ft	287.66 Kips	68.10 Kips	355.76 Kips
43.01 ft	287.94 Kips	245.97 Kips	533.91 Kips
52.01 ft	452.31 Kips	245.97 Kips	698.28 Kips
52.99 ft	472.35 Kips	245.97 Kips	718.33 Kips
53.01 ft	472.82 Kips	421.11 Kips	893.93 Kips
62.01 ft	727.25 Kips	421.11 Kips	1148.37 Kips
62.99 ft	757.64 Kips	421.11 Kips	1178.75 Kips
63.01 ft	758.15 Kips	104.87 Kips	863.02 Kips
67.99 ft	861.47 Kips	104.87 Kips	966.34 Kips
68.01 ft	862.02 Kips	421.11 Kips	1283.13 Kips
74.99 ft	1110.03 Kips	421.11 Kips	1531.14 Kips

ULTIMATE - SKIN FRICTION

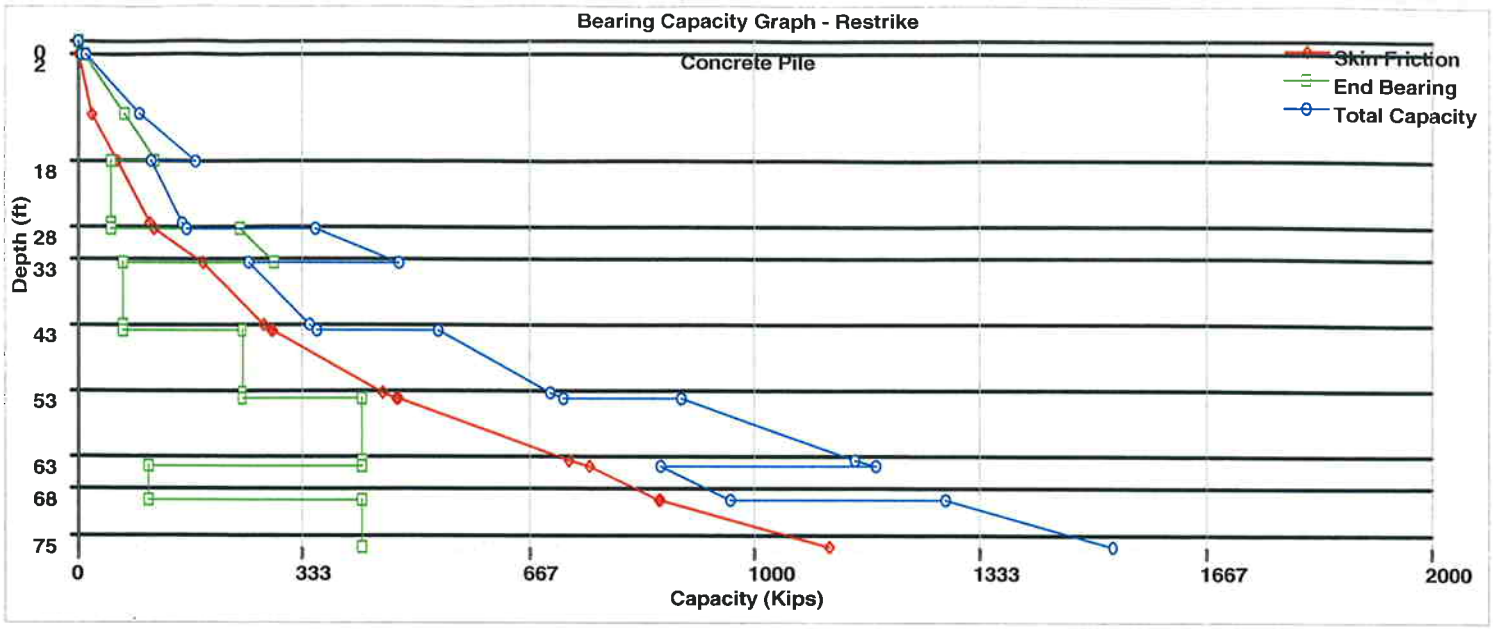
Depth	Soil Type	Effective Stress At Midpoint	Sliding Friction Angle	Adhesion	Skin Friction
0.01 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
1.99 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
2.01 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
3.48 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
3.49 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
11.01 ft	Cohesionless	397.60 psf	31.61	N/A	19.70 Kips
17.99 ft	Cohesionless	598.62 psf	31.61	N/A	57.20 Kips
18.01 ft	Cohesionless	1017.09 psf	27.95	N/A	57.31 Kips
27.01 ft	Cohesionless	1276.29 psf	27.95	N/A	105.08 Kips
27.99 ft	Cohesionless	1304.51 psf	27.95	N/A	111.45 Kips
28.01 ft	Cohesionless	1593.14 psf	32.95	N/A	111.65 Kips
32.99 ft	Cohesionless	1761.46 psf	32.95	N/A	183.28 Kips
33.01 ft	Cohesionless	1931.09 psf	28.69	N/A	183.53 Kips
42.01 ft	Cohesionless	2190.29 psf	28.69	N/A	274.70 Kips
42.99 ft	Cohesionless	2218.51 psf	28.69	N/A	285.93 Kips
43.01 ft	Cohesionless	2507.14 psf	31.48	N/A	286.21 Kips
52.01 ft	Cohesionless	2811.34 psf	31.48	N/A	450.58 Kips
52.99 ft	Cohesionless	2844.46 psf	31.48	N/A	470.62 Kips
53.01 ft	Cohesionless	3183.14 psf	32.90	N/A	471.09 Kips
62.01 ft	Cohesionless	3487.34 psf	32.90	N/A	725.52 Kips
62.99 ft	Cohesionless	3520.46 psf	32.90	N/A	755.91 Kips
63.01 ft	Cohesionless	3859.09 psf	29.56	N/A	756.42 Kips
67.99 ft	Cohesionless	4002.51 psf	29.56	N/A	859.74 Kips
68.01 ft	Cohesionless	4147.14 psf	32.90	N/A	860.29 Kips
74.99 ft	Cohesionless	4383.06 psf	32.90	N/A	1108.30 Kips

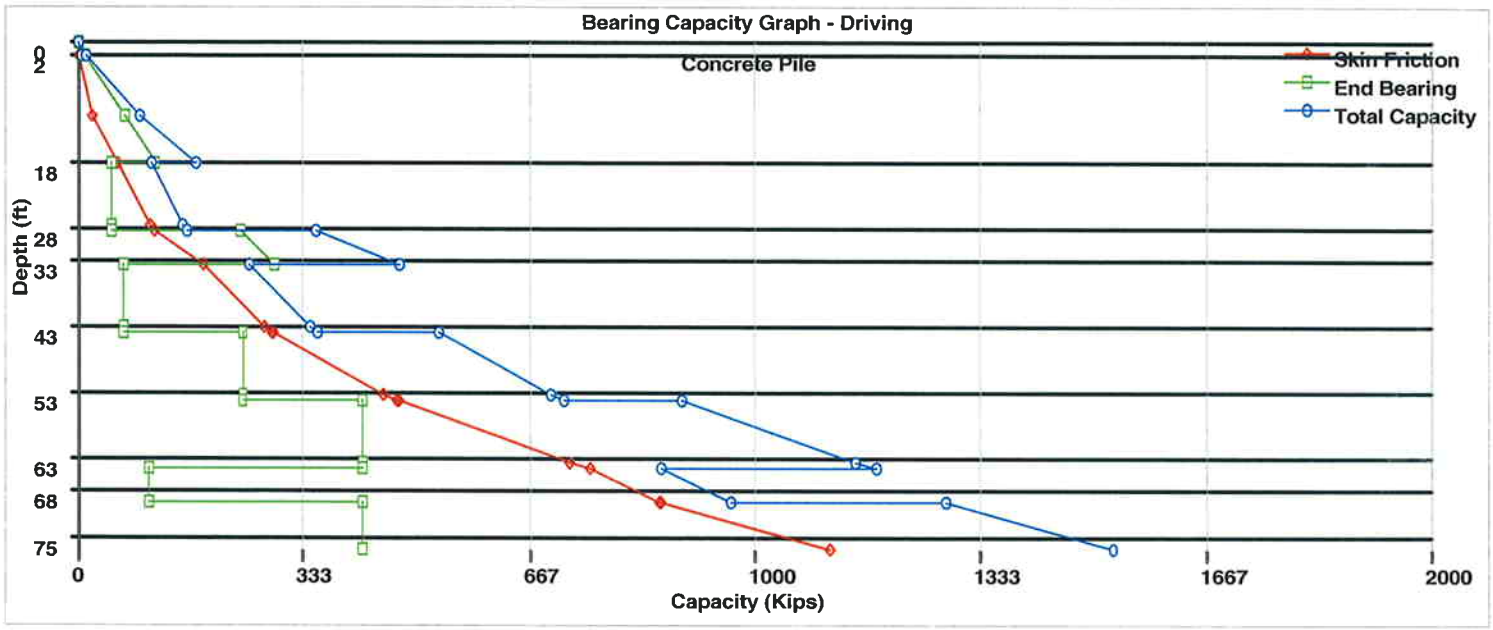
ULTIMATE - END BEARING

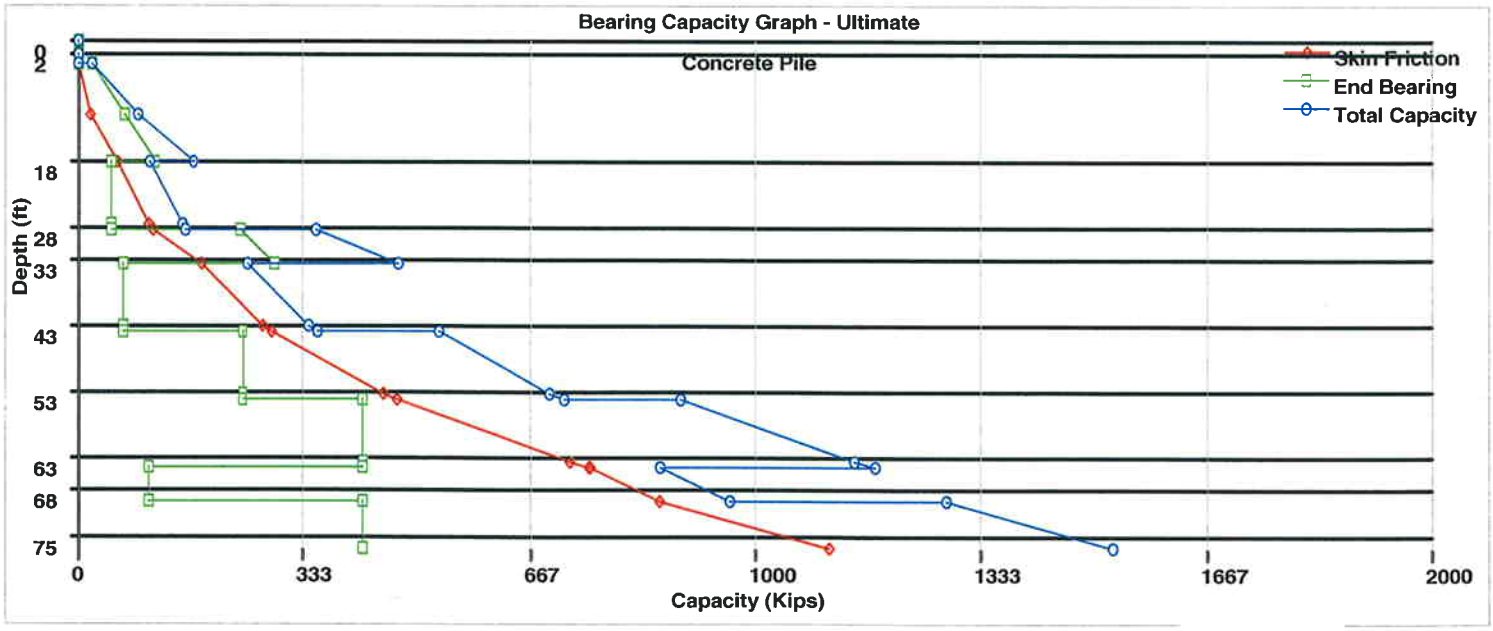
Depth	Soil Type	Effective Stress At Tip	Bearing Cap. Factor	Limiting End Bearing	End Bearing
0.01 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
1.99 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
2.01 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
3.48 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
3.49 ft	Cohesionless	181.02 psf	60.52	259.67 Kips	20.48 Kips
11.01 ft	Cohesionless	614.18 psf	60.52	259.67 Kips	69.47 Kips
17.99 ft	Cohesionless	1016.22 psf	60.52	259.67 Kips	114.95 Kips
18.01 ft	Cohesionless	1017.38 psf	33.00	48.78 Kips	48.78 Kips
27.01 ft	Cohesionless	1535.78 psf	33.00	48.78 Kips	48.78 Kips
27.99 ft	Cohesionless	1592.22 psf	33.00	48.78 Kips	48.78 Kips
28.01 ft	Cohesionless	1593.48 psf	78.23	426.79 Kips	240.30 Kips
32.99 ft	Cohesionless	1930.12 psf	78.23	426.79 Kips	291.07 Kips
33.01 ft	Cohesionless	1931.38 psf	37.25	68.10 Kips	68.10 Kips
42.01 ft	Cohesionless	2449.78 psf	37.25	68.10 Kips	68.10 Kips
42.99 ft	Cohesionless	2506.22 psf	37.25	68.10 Kips	68.10 Kips
43.01 ft	Cohesionless	2507.48 psf	59.30	245.97 Kips	245.97 Kips
52.01 ft	Cohesionless	3115.88 psf	59.30	245.97 Kips	245.97 Kips
52.99 ft	Cohesionless	3182.12 psf	59.30	245.97 Kips	245.97 Kips
53.01 ft	Cohesionless	3183.48 psf	77.60	421.11 Kips	421.11 Kips
62.01 ft	Cohesionless	3791.88 psf	77.60	421.11 Kips	421.11 Kips
62.99 ft	Cohesionless	3858.12 psf	77.60	421.11 Kips	421.11 Kips
63.01 ft	Cohesionless	3859.38 psf	42.17	104.87 Kips	104.87 Kips
67.99 ft	Cohesionless	4146.22 psf	42.17	104.87 Kips	104.87 Kips
68.01 ft	Cohesionless	4147.48 psf	77.60	421.11 Kips	421.11 Kips
74.99 ft	Cohesionless	4619.32 psf	77.60	421.11 Kips	421.11 Kips

ULTIMATE - SUMMARY OF CAPACITIES

Depth	Skin Friction	End Bearing	Total Capacity
0.01 ft	0.00 Kips	0.00 Kips	0.00 Kips
1.99 ft	0.00 Kips	0.00 Kips	0.00 Kips
2.01 ft	0.00 Kips	0.00 Kips	0.00 Kips
3.48 ft	0.00 Kips	0.00 Kips	0.00 Kips
3.49 ft	0.00 Kips	20.48 Kips	20.48 Kips
11.01 ft	19.70 Kips	69.47 Kips	89.18 Kips
17.99 ft	57.20 Kips	114.95 Kips	172.15 Kips
18.01 ft	57.31 Kips	48.78 Kips	106.09 Kips
27.01 ft	105.08 Kips	48.78 Kips	153.86 Kips
27.99 ft	111.45 Kips	48.78 Kips	160.23 Kips
28.01 ft	111.65 Kips	240.30 Kips	351.95 Kips
32.99 ft	183.28 Kips	291.07 Kips	474.35 Kips
33.01 ft	183.53 Kips	68.10 Kips	251.63 Kips
42.01 ft	274.70 Kips	68.10 Kips	342.80 Kips
42.99 ft	285.93 Kips	68.10 Kips	354.02 Kips
43.01 ft	286.21 Kips	245.97 Kips	532.18 Kips
52.01 ft	450.58 Kips	245.97 Kips	696.55 Kips
52.99 ft	470.62 Kips	245.97 Kips	716.60 Kips
53.01 ft	471.09 Kips	421.11 Kips	892.20 Kips
62.01 ft	725.52 Kips	421.11 Kips	1146.64 Kips
62.99 ft	755.91 Kips	421.11 Kips	1177.02 Kips
63.01 ft	756.42 Kips	104.87 Kips	861.29 Kips
67.99 ft	859.74 Kips	104.87 Kips	964.61 Kips
68.01 ft	860.29 Kips	421.11 Kips	1281.40 Kips
74.99 ft	1108.30 Kips	421.11 Kips	1529.41 Kips


Bearing Capacity Graph - Restrike
Concrete Pile
Skin Friction
End Bearing
Total Capacity
Depth (ft)
0
2
18
28
33
43
53
63
68
75
0
333
667
1000
1333
1667
2000
Capacity (Kips)


Bearing Capacity Graph - Driving
Concrete Pile
Skin Friction
End Bearing
Total Capacity
Depth (ft)
0
2
18
28
33
43
53
63
68
75
0
333
667
1000
1333
1667
2000
Capacity (Kips)


Bearing Capacity Graph - Ultimate
Concrete Pile
Skin Friction
End Bearing
Total Capacity
Depth (ft)
0
2
18
28
33
43
53
63
68
75
0
333
667
1000
1333
1667
2000
Capacity (Kips)

DRIVEN 1.0

GENERAL PROJECT INFORMATION

Filename: C:\DOCUME~1\AWIJAYA\DESKTOP\DRIVEN\ALTAMA~1\BENT59~1.DVN
Project Name: Altamaha River - BENT 59 Project Date: 06/29/2012
Project Client: Heath Lineback
Computed By: SRF
Project Manager: SS

PILE INFORMATION

Pile Type: Concrete Pile
Top of Pile: 5.00 ft
Length of Square Side: 16.00 in

ULTIMATE CONSIDERATIONS

Water Table Depth At Time Of:	- Drilling:	5.00 ft
	- Driving/Restrike	5.00 ft
	- Ultimate:	-4.00 ft
Ultimate Considerations:	- Local Scour:	0.00 ft
	- Long Term Scour:	0.00 ft
	- Soft Soil:	0.00 ft

ULTIMATE PROFILE

Layer	Type	Thickness	Driving Loss	Unit Weight	Strength	Ultimate Curve
1	Cohesionless	8.00 ft	0.00%	110.00 pcf	30.2/30.2	Nordlund
2	Cohesionless	8.00 ft	0.00%	120.00 pcf	32.3/32.3	Nordlund
3	Cohesionless	5.00 ft	0.00%	130.00 pcf	36.0/36.0	Nordlund
4	Cohesive	5.00 ft	0.00%	120.00 pcf	0.00 psf	User Def.
5	Cohesionless	5.00 ft	0.00%	120.00 pcf	33.7/33.7	Nordlund
6	Cohesionless	5.00 ft	0.00%	120.00 pcf	29.5/29.5	Nordlund
7	Cohesionless	20.00 ft	0.00%	120.00 pcf	31.3/31.3	Nordlund
8	Cohesionless	5.00 ft	0.00%	130.00 pcf	35.1/35.1	Nordlund
9	Cohesionless	19.00 ft	0.00%	130.00 pcf	43.0/43.0	Nordlund

RESTRIKE - SKIN FRICTION

Depth	Soil Type	Effective Stress At Midpoint	Sliding Friction Angle	Adhesion	Skin Friction
0.01 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
4.99 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
4.99 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
5.00 ft	Cohesionless	550.00 psf	27.20	N/A	0.00 Kips
5.01 ft	Cohesionless	550.24 psf	27.20	N/A	0.02 Kips
7.99 ft	Cohesionless	621.16 psf	27.20	N/A	5.49 Kips
8.01 ft	Cohesionless	693.09 psf	29.12	N/A	5.54 Kips
15.99 ft	Cohesionless	922.91 psf	29.12	N/A	33.91 Kips
16.01 ft	Cohesionless	1153.94 psf	32.44	N/A	34.02 Kips
20.99 ft	Cohesionless	1322.26 psf	32.44	N/A	73.35 Kips
21.01 ft	Cohesive	N/A	N/A	845.00 psf	73.49 Kips
25.99 ft	Cohesive	N/A	N/A	845.00 psf	95.93 Kips
26.01 ft	Cohesionless	1779.89 psf	30.37	N/A	96.06 Kips
30.99 ft	Cohesionless	1923.31 psf	30.37	N/A	138.90 Kips
31.01 ft	Cohesionless	2067.89 psf	26.62	N/A	139.05 Kips
35.99 ft	Cohesionless	2211.31 psf	26.62	N/A	169.56 Kips
36.01 ft	Cohesionless	2355.89 psf	28.22	N/A	169.70 Kips
45.01 ft	Cohesionless	2615.09 psf	28.22	N/A	250.25 Kips
54.01 ft	Cohesionless	2874.29 psf	28.22	N/A	346.76 Kips
55.99 ft	Cohesionless	2931.31 psf	28.22	N/A	370.13 Kips
56.01 ft	Cohesionless	3507.94 psf	31.60	N/A	370.43 Kips
60.99 ft	Cohesionless	3676.26 psf	31.60	N/A	464.51 Kips
61.01 ft	Cohesionless	3845.94 psf	38.74	N/A	465.11 Kips
70.01 ft	Cohesionless	4150.14 psf	38.74	N/A	850.92 Kips
79.01 ft	Cohesionless	4454.34 psf	38.74	N/A	1293.28 Kips
79.99 ft	Cohesionless	4487.46 psf	38.74	N/A	1344.87 Kips

RESTRIKE - END BEARING

Depth	Soil Type	Effective Stress At Tip	Bearing Cap. Factor	Limiting End Bearing	End Bearing
0.01 ft	Cohesionless	0.00 psf	30.99	26.16 Kips	0.00 Kips
4.99 ft	Cohesionless	0.00 psf	30.99	26.16 Kips	0.00 Kips
4.99 ft	Cohesionless	0.00 psf	30.99	26.16 Kips	0.00 Kips
5.00 ft	Cohesionless	550.00 psf	30.99	26.16 Kips	17.70 Kips
5.01 ft	Cohesionless	550.48 psf	30.99	26.16 Kips	17.72 Kips
7.99 ft	Cohesionless	692.32 psf	30.99	26.16 Kips	22.29 Kips
8.01 ft	Cohesionless	693.38 psf	42.06	66.63 Kips	32.82 Kips
15.99 ft	Cohesionless	1153.02 psf	42.06	66.63 Kips	54.57 Kips
16.01 ft	Cohesionless	1154.28 psf	77.60	269.51 Kips	110.41 Kips
20.99 ft	Cohesionless	1490.92 psf	77.60	269.51 Kips	142.61 Kips
21.01 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
25.99 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
26.01 ft	Cohesionless	1780.18 psf	53.16	114.13 Kips	110.68 Kips
30.99 ft	Cohesionless	2067.02 psf	53.16	114.13 Kips	114.13 Kips
31.01 ft	Cohesionless	2068.18 psf	28.34	23.68 Kips	23.68 Kips
35.99 ft	Cohesionless	2355.02 psf	28.34	23.68 Kips	23.68 Kips
36.01 ft	Cohesionless	2356.18 psf	36.86	41.74 Kips	41.74 Kips
45.01 ft	Cohesionless	2874.58 psf	36.86	41.74 Kips	41.74 Kips
54.01 ft	Cohesionless	3392.98 psf	36.86	41.74 Kips	41.74 Kips
55.99 ft	Cohesionless	3507.02 psf	36.86	41.74 Kips	41.74 Kips
56.01 ft	Cohesionless	3508.28 psf	64.95	196.76 Kips	196.76 Kips
60.99 ft	Cohesionless	3844.92 psf	64.95	196.76 Kips	196.76 Kips
61.01 ft	Cohesionless	3846.28 psf	307.00	1204.62 Kips	1204.62 Kips
70.01 ft	Cohesionless	4454.68 psf	307.00	1204.62 Kips	1204.62 Kips
79.01 ft	Cohesionless	5063.08 psf	307.00	1204.62 Kips	1204.62 Kips
79.99 ft	Cohesionless	5129.32 psf	307.00	1204.62 Kips	1204.62 Kips

RESTRIKE - SUMMARY OF CAPACITIES

Depth	Skin Friction	End Bearing	Total Capacity
0.01 ft	0.00 Kips	0.00 Kips	0.00 Kips
4.99 ft	0.00 Kips	0.00 Kips	0.00 Kips
4.99 ft	0.00 Kips	0.00 Kips	0.00 Kips
5.00 ft	0.00 Kips	17.70 Kips	17.70 Kips
5.01 ft	0.02 Kips	17.72 Kips	17.74 Kips
7.99 ft	5.49 Kips	22.29 Kips	27.78 Kips
8.01 ft	5.54 Kips	32.82 Kips	38.36 Kips
15.99 ft	33.91 Kips	54.57 Kips	88.48 Kips
16.01 ft	34.02 Kips	110.41 Kips	144.43 Kips
20.99 ft	73.35 Kips	142.61 Kips	215.96 Kips
21.01 ft	73.49 Kips	0.00 Kips	73.49 Kips
25.99 ft	95.93 Kips	0.00 Kips	95.93 Kips
26.01 ft	96.06 Kips	110.68 Kips	206.73 Kips
30.99 ft	138.90 Kips	114.13 Kips	253.04 Kips
31.01 ft	139.05 Kips	23.68 Kips	162.73 Kips
35.99 ft	169.56 Kips	23.68 Kips	193.24 Kips
36.01 ft	169.70 Kips	41.74 Kips	211.44 Kips
45.01 ft	250.25 Kips	41.74 Kips	291.99 Kips
54.01 ft	346.76 Kips	41.74 Kips	388.50 Kips
55.99 ft	370.13 Kips	41.74 Kips	411.88 Kips
56.01 ft	370.43 Kips	196.76 Kips	567.20 Kips
60.99 ft	464.51 Kips	196.76 Kips	661.28 Kips
61.01 ft	465.11 Kips	1204.62 Kips	1669.73 Kips
70.01 ft	850.92 Kips	1204.62 Kips	2055.54 Kips
79.01 ft	1293.28 Kips	1204.62 Kips	2497.91 Kips
79.99 ft	1344.87 Kips	1204.62 Kips	2549.49 Kips

DRIVING - SKIN FRICTION

Depth	Soil Type	Effective Stress At Midpoint	Sliding Friction Angle	Adhesion	Skin Friction
0.01 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
4.99 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
4.99 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
5.00 ft	Cohesionless	550.00 psf	27.20	N/A	0.00 Kips
5.01 ft	Cohesionless	550.24 psf	27.20	N/A	0.02 Kips
7.99 ft	Cohesionless	621.16 psf	27.20	N/A	5.49 Kips
8.01 ft	Cohesionless	693.09 psf	29.12	N/A	5.54 Kips
15.99 ft	Cohesionless	922.91 psf	29.12	N/A	33.91 Kips
16.01 ft	Cohesionless	1153.94 psf	32.44	N/A	34.02 Kips
20.99 ft	Cohesionless	1322.26 psf	32.44	N/A	73.35 Kips
21.01 ft	Cohesive	N/A	N/A	845.00 psf	73.49 Kips
25.99 ft	Cohesive	N/A	N/A	845.00 psf	95.93 Kips
26.01 ft	Cohesionless	1779.89 psf	30.37	N/A	96.06 Kips
30.99 ft	Cohesionless	1923.31 psf	30.37	N/A	138.90 Kips
31.01 ft	Cohesionless	2067.89 psf	26.62	N/A	139.05 Kips
35.99 ft	Cohesionless	2211.31 psf	26.62	N/A	169.56 Kips
36.01 ft	Cohesionless	2355.89 psf	28.22	N/A	169.70 Kips
45.01 ft	Cohesionless	2615.09 psf	28.22	N/A	250.25 Kips
54.01 ft	Cohesionless	2874.29 psf	28.22	N/A	346.76 Kips
55.99 ft	Cohesionless	2931.31 psf	28.22	N/A	370.13 Kips
56.01 ft	Cohesionless	3507.94 psf	31.60	N/A	370.43 Kips
60.99 ft	Cohesionless	3676.26 psf	31.60	N/A	464.51 Kips
61.01 ft	Cohesionless	3845.94 psf	38.74	N/A	465.11 Kips
70.01 ft	Cohesionless	4150.14 psf	38.74	N/A	850.92 Kips
79.01 ft	Cohesionless	4454.34 psf	38.74	N/A	1293.28 Kips
79.99 ft	Cohesionless	4487.46 psf	38.74	N/A	1344.87 Kips

DRIVING - END BEARING

Depth	Soil Type	Effective Stress At Tip	Bearing Cap. Factor	Limiting End Bearing	End Bearing
0.01 ft	Cohesionless	0.00 psf	30.99	26.16 Kips	0.00 Kips
4.99 ft	Cohesionless	0.00 psf	30.99	26.16 Kips	0.00 Kips
4.99 ft	Cohesionless	0.00 psf	30.99	26.16 Kips	0.00 Kips
5.00 ft	Cohesionless	550.00 psf	30.99	26.16 Kips	17.70 Kips
5.01 ft	Cohesionless	550.48 psf	30.99	26.16 Kips	17.72 Kips
7.99 ft	Cohesionless	692.32 psf	30.99	26.16 Kips	22.29 Kips
8.01 ft	Cohesionless	693.38 psf	42.06	66.63 Kips	32.82 Kips
15.99 ft	Cohesionless	1153.02 psf	42.06	66.63 Kips	54.57 Kips
16.01 ft	Cohesionless	1154.28 psf	77.60	269.51 Kips	110.41 Kips
20.99 ft	Cohesionless	1490.92 psf	77.60	269.51 Kips	142.61 Kips
21.01 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
25.99 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
26.01 ft	Cohesionless	1780.18 psf	53.16	114.13 Kips	110.68 Kips
30.99 ft	Cohesionless	2067.02 psf	53.16	114.13 Kips	114.13 Kips
31.01 ft	Cohesionless	2068.18 psf	28.34	23.68 Kips	23.68 Kips
35.99 ft	Cohesionless	2355.02 psf	28.34	23.68 Kips	23.68 Kips
36.01 ft	Cohesionless	2356.18 psf	36.86	41.74 Kips	41.74 Kips
45.01 ft	Cohesionless	2874.58 psf	36.86	41.74 Kips	41.74 Kips
54.01 ft	Cohesionless	3392.98 psf	36.86	41.74 Kips	41.74 Kips
55.99 ft	Cohesionless	3507.02 psf	36.86	41.74 Kips	41.74 Kips
56.01 ft	Cohesionless	3508.28 psf	64.95	196.76 Kips	196.76 Kips
60.99 ft	Cohesionless	3844.92 psf	64.95	196.76 Kips	196.76 Kips
61.01 ft	Cohesionless	3846.28 psf	307.00	1204.62 Kips	1204.62 Kips
70.01 ft	Cohesionless	4454.68 psf	307.00	1204.62 Kips	1204.62 Kips
79.01 ft	Cohesionless	5063.08 psf	307.00	1204.62 Kips	1204.62 Kips
79.99 ft	Cohesionless	5129.32 psf	307.00	1204.62 Kips	1204.62 Kips

DRIVING - SUMMARY OF CAPACITIES

Depth	Skin Friction	End Bearing	Total Capacity
0.01 ft	0.00 Kips	0.00 Kips	0.00 Kips
4.99 ft	0.00 Kips	0.00 Kips	0.00 Kips
4.99 ft	0.00 Kips	0.00 Kips	0.00 Kips
5.00 ft	0.00 Kips	17.70 Kips	17.70 Kips
5.01 ft	0.02 Kips	17.72 Kips	17.74 Kips
7.99 ft	5.49 Kips	22.29 Kips	27.78 Kips
8.01 ft	5.54 Kips	32.82 Kips	38.36 Kips
15.99 ft	33.91 Kips	54.57 Kips	88.48 Kips
16.01 ft	34.02 Kips	110.41 Kips	144.43 Kips
20.99 ft	73.35 Kips	142.61 Kips	215.96 Kips
21.01 ft	73.49 Kips	0.00 Kips	73.49 Kips
25.99 ft	95.93 Kips	0.00 Kips	95.93 Kips
26.01 ft	96.06 Kips	110.68 Kips	206.73 Kips
30.99 ft	138.90 Kips	114.13 Kips	253.04 Kips
31.01 ft	139.05 Kips	23.68 Kips	162.73 Kips
35.99 ft	169.56 Kips	23.68 Kips	193.24 Kips
36.01 ft	169.70 Kips	41.74 Kips	211.44 Kips
45.01 ft	250.25 Kips	41.74 Kips	291.99 Kips
54.01 ft	346.76 Kips	41.74 Kips	388.50 Kips
55.99 ft	370.13 Kips	41.74 Kips	411.88 Kips
56.01 ft	370.43 Kips	196.76 Kips	567.20 Kips
60.99 ft	464.51 Kips	196.76 Kips	661.28 Kips
61.01 ft	465.11 Kips	1204.62 Kips	1669.73 Kips
70.01 ft	850.92 Kips	1204.62 Kips	2055.54 Kips
79.01 ft	1293.28 Kips	1204.62 Kips	2497.91 Kips
79.99 ft	1344.87 Kips	1204.62 Kips	2549.49 Kips

ULTIMATE - SKIN FRICTION

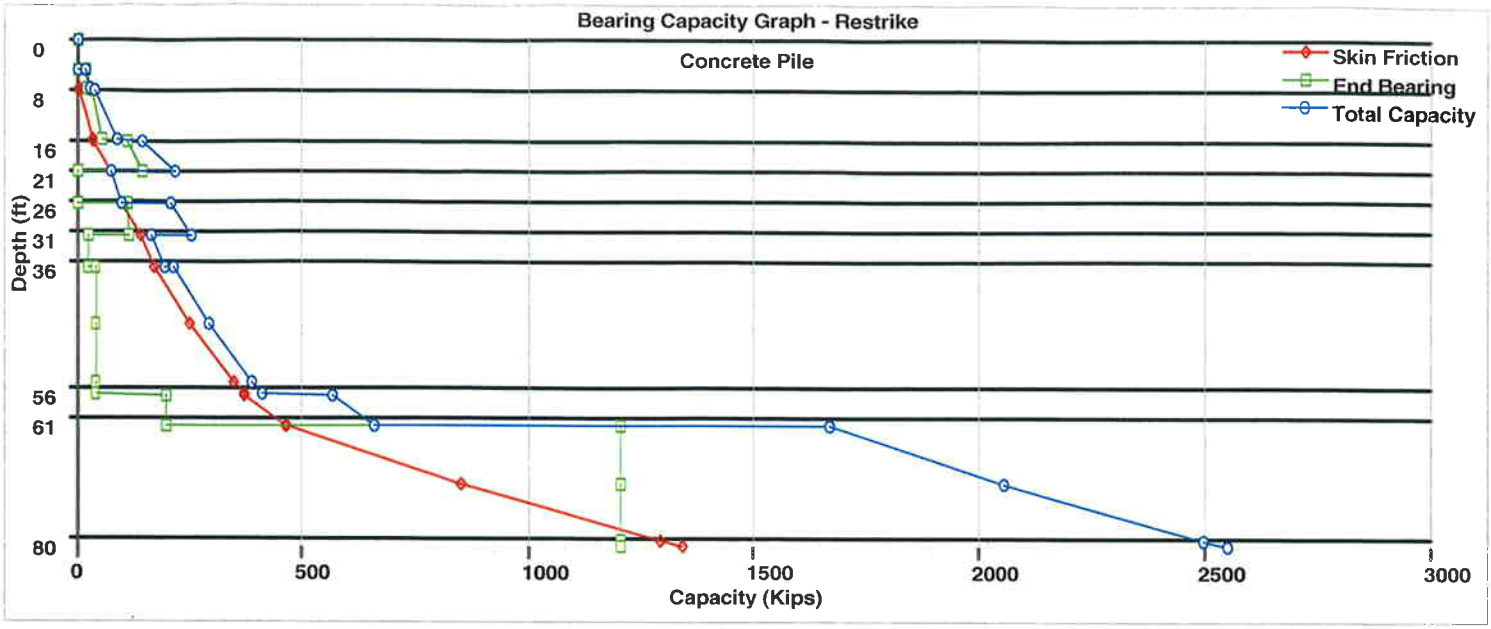
Depth	Soil Type	Effective Stress At Midpoint	Sliding Friction Angle	Adhesion	Skin Friction
0.01 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
4.99 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
4.99 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
5.00 ft	Cohesionless	238.00 psf	27.20	N/A	0.00 Kips
5.01 ft	Cohesionless	238.24 psf	27.20	N/A	0.01 Kips
7.99 ft	Cohesionless	309.16 psf	27.20	N/A	2.73 Kips
8.01 ft	Cohesionless	381.09 psf	29.12	N/A	2.76 Kips
15.99 ft	Cohesionless	610.91 psf	29.12	N/A	21.54 Kips
16.01 ft	Cohesionless	841.94 psf	32.44	N/A	21.62 Kips
20.99 ft	Cohesionless	1010.26 psf	32.44	N/A	51.68 Kips
21.01 ft	Cohesive	N/A	N/A	845.00 psf	51.79 Kips
25.99 ft	Cohesive	N/A	N/A	845.00 psf	74.24 Kips
26.01 ft	Cohesionless	1467.89 psf	30.37	N/A	74.35 Kips
30.99 ft	Cohesionless	1611.31 psf	30.37	N/A	110.25 Kips
31.01 ft	Cohesionless	1755.89 psf	26.62	N/A	110.37 Kips
35.99 ft	Cohesionless	1899.31 psf	26.62	N/A	136.57 Kips
36.01 ft	Cohesionless	2043.89 psf	28.22	N/A	136.70 Kips
45.01 ft	Cohesionless	2303.09 psf	28.22	N/A	207.64 Kips
54.01 ft	Cohesionless	2562.29 psf	28.22	N/A	294.54 Kips
55.99 ft	Cohesionless	2619.31 psf	28.22	N/A	315.80 Kips
56.01 ft	Cohesionless	3195.94 psf	31.60	N/A	316.07 Kips
60.99 ft	Cohesionless	3364.26 psf	31.60	N/A	402.17 Kips
61.01 ft	Cohesionless	3533.94 psf	38.74	N/A	402.72 Kips
70.01 ft	Cohesionless	3838.14 psf	38.74	N/A	759.52 Kips
79.01 ft	Cohesionless	4142.34 psf	38.74	N/A	1172.89 Kips
79.99 ft	Cohesionless	4175.46 psf	38.74	N/A	1221.31 Kips

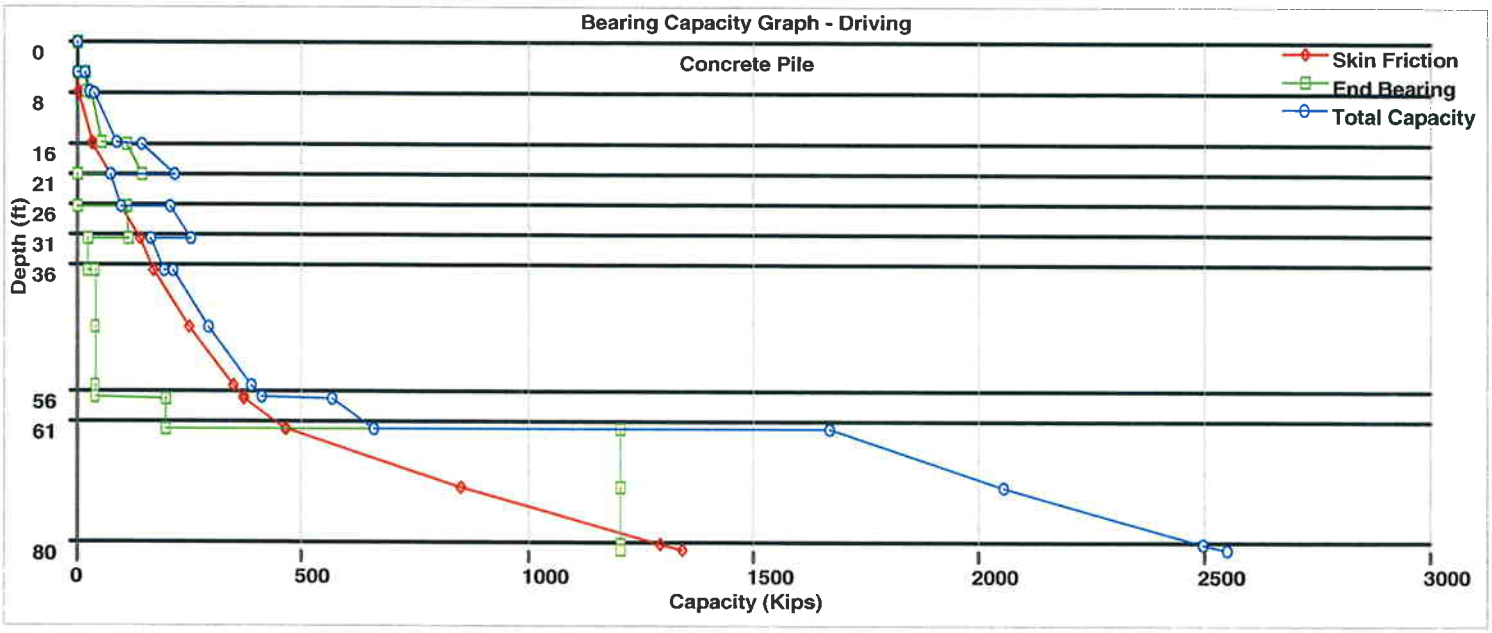
ULTIMATE - END BEARING

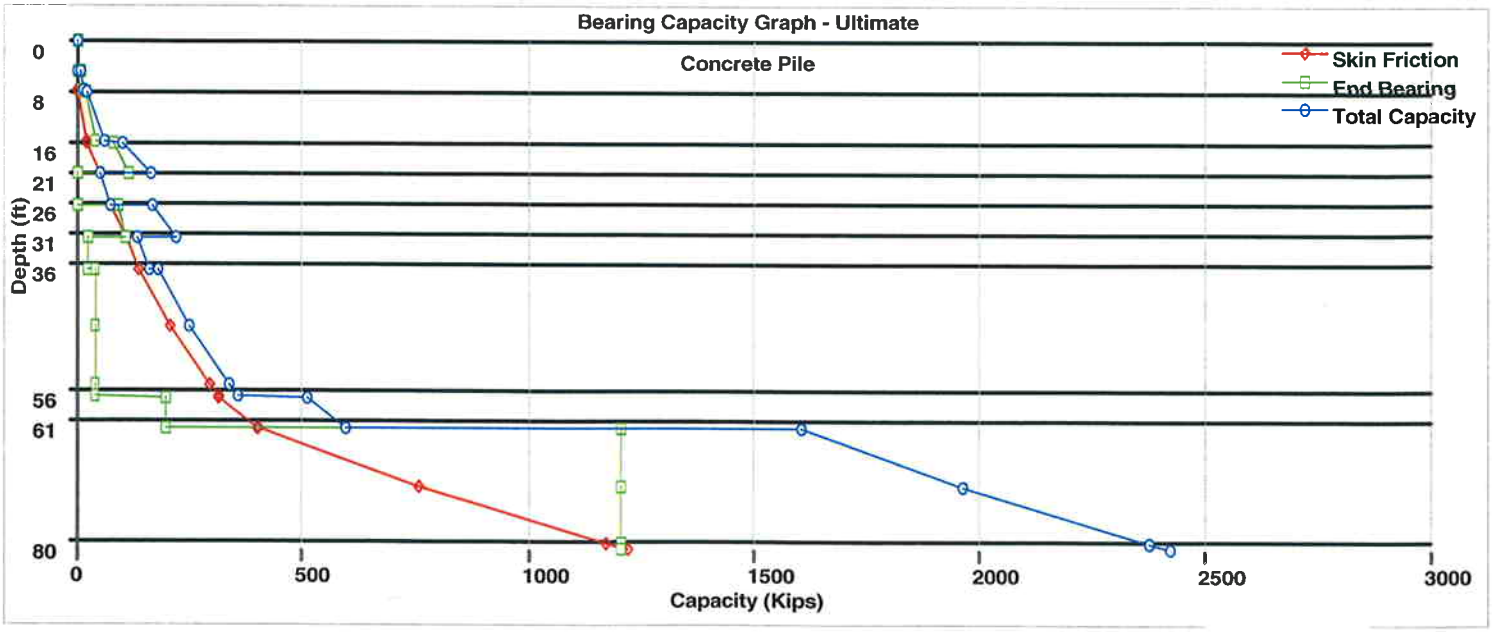
Depth	Soil Type	Effective Stress At Tip	Bearing Cap. Factor	Limiting End Bearing	End Bearing
0.01 ft	Cohesionless	0.00 psf	30.99	26.16 Kips	0.00 Kips
4.99 ft	Cohesionless	0.00 psf	30.99	26.16 Kips	0.00 Kips
4.99 ft	Cohesionless	0.00 psf	30.99	26.16 Kips	0.00 Kips
5.00 ft	Cohesionless	238.00 psf	30.99	26.16 Kips	7.66 Kips
5.01 ft	Cohesionless	238.48 psf	30.99	26.16 Kips	7.68 Kips
7.99 ft	Cohesionless	380.32 psf	30.99	26.16 Kips	12.24 Kips
8.01 ft	Cohesionless	381.38 psf	42.06	66.63 Kips	18.05 Kips
15.99 ft	Cohesionless	841.02 psf	42.06	66.63 Kips	39.80 Kips
16.01 ft	Cohesionless	842.28 psf	77.60	269.51 Kips	80.56 Kips
20.99 ft	Cohesionless	1178.92 psf	77.60	269.51 Kips	112.76 Kips
21.01 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
25.99 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
26.01 ft	Cohesionless	1468.18 psf	53.16	114.13 Kips	91.28 Kips
30.99 ft	Cohesionless	1755.02 psf	53.16	114.13 Kips	107.97 Kips
31.01 ft	Cohesionless	1756.18 psf	28.34	23.68 Kips	23.68 Kips
35.99 ft	Cohesionless	2043.02 psf	28.34	23.68 Kips	23.68 Kips
36.01 ft	Cohesionless	2044.18 psf	36.86	41.74 Kips	41.74 Kips
45.01 ft	Cohesionless	2562.58 psf	36.86	41.74 Kips	41.74 Kips
54.01 ft	Cohesionless	3080.98 psf	36.86	41.74 Kips	41.74 Kips
55.99 ft	Cohesionless	3195.02 psf	36.86	41.74 Kips	41.74 Kips
56.01 ft	Cohesionless	3196.28 psf	64.95	196.76 Kips	196.76 Kips
60.99 ft	Cohesionless	3532.92 psf	64.95	196.76 Kips	196.76 Kips
61.01 ft	Cohesionless	3534.28 psf	307.00	1204.62 Kips	1204.62 Kips
70.01 ft	Cohesionless	4142.68 psf	307.00	1204.62 Kips	1204.62 Kips
79.01 ft	Cohesionless	4751.08 psf	307.00	1204.62 Kips	1204.62 Kips
79.99 ft	Cohesionless	4817.32 psf	307.00	1204.62 Kips	1204.62 Kips

ULTIMATE - SUMMARY OF CAPACITIES

Depth	Skin Friction	End Bearing	Total Capacity
0.01 ft	0.00 Kips	0.00 Kips	0.00 Kips
4.99 ft	0.00 Kips	0.00 Kips	0.00 Kips
4.99 ft	0.00 Kips	0.00 Kips	0.00 Kips
5.00 ft	0.00 Kips	7.66 Kips	7.66 Kips
5.01 ft	0.01 Kips	7.68 Kips	7.68 Kips
7.99 ft	2.73 Kips	12.24 Kips	14.98 Kips
8.01 ft	2.76 Kips	18.05 Kips	20.81 Kips
15.99 ft	21.54 Kips	39.80 Kips	61.34 Kips
16.01 ft	21.62 Kips	80.56 Kips	102.19 Kips
20.99 ft	51.68 Kips	112.76 Kips	164.44 Kips
21.01 ft	51.79 Kips	0.00 Kips	51.79 Kips
25.99 ft	74.24 Kips	0.00 Kips	74.24 Kips
26.01 ft	74.35 Kips	91.28 Kips	165.63 Kips
30.99 ft	110.25 Kips	107.97 Kips	218.21 Kips
31.01 ft	110.37 Kips	23.68 Kips	134.05 Kips
35.99 ft	136.57 Kips	23.68 Kips	160.25 Kips
36.01 ft	136.70 Kips	41.74 Kips	178.44 Kips
45.01 ft	207.64 Kips	41.74 Kips	249.38 Kips
54.01 ft	294.54 Kips	41.74 Kips	336.28 Kips
55.99 ft	315.80 Kips	41.74 Kips	357.54 Kips
56.01 ft	316.07 Kips	196.76 Kips	512.84 Kips
60.99 ft	402.17 Kips	196.76 Kips	598.93 Kips
61.01 ft	402.72 Kips	1204.62 Kips	1607.34 Kips
70.01 ft	759.52 Kips	1204.62 Kips	1964.15 Kips
79.01 ft	1172.89 Kips	1204.62 Kips	2377.51 Kips
79.99 ft	1221.31 Kips	1204.62 Kips	2425.93 Kips


Bearing Capacity Graph - Restrike
Concrete Pile
Skin Friction
End Bearing
Total Capacity
Depth (ft)
0
8
16
21
26
31
36
56
61
80
0
500
1000
1500
2000
2500
3000
Capacity (Kips)


Bearing Capacity Graph - Driving
Concrete Pile
Skin Friction
End Bearing
Total Capacity
Depth (ft)
0
8
16
21
26
31
36
56
61
80
0
500
1000
1500
2000
2500
3000
Capacity (Kips)


Bearing Capacity Graph - Ultimate
Concrete Pile
Skin Friction
End Bearing
Total Capacity
Depth (ft)
0
8
16
21
26
31
36
56
61
80
0
500
1000
1500
2000
2500
3000
Capacity (Kips)