COLLETON COUNTY
SOUTH CAROLINA

113 Mable T. Willis Blvd.
Walterboro, SC 29488

BID: CPST-04
PROFESSIONAL SERVICES FOR THE SOLID WASTE TRANSFER STATION

MANDATORY PRE-BID CONFERENCE:

Thursday, November 10, 2016 at 10:00am

located at the project site: 3288 Greenpond Hwy, Walterboro, SC 29488

BIDS DUE: Tuesday, November 22, 2016 @ 11:00am

Addendum #2

dated 11-18-2016

ALLIANCE CONSULTING ENGINEERS

Construction Coordinator
Alliance Consulting Engineers, Inc.
Post Office Box 8147
Columbia, SC 29202-8147
(803) 779-2078 ● (803) 779-2079 fax
www.allianceCE.com

The following changes are hereby made to the Bid Documents and Specifications for the CPST-04 Professional Services for the Colleton County Solid Waste Transfer Station.

1. **Contract Document Clarification:**
   A. Division 00 and Division 01 of the Bid Documents shall supersede any and all other Divisions of the RFP Document listed as CPST-04.
   B. Article 14, Submittal of Bid, Section 14.01, A bidder shall furnish one (1) original bound copy of the Bid Documents in numerical order. The original document shall be bound in some type of binder. Stapling does not constitute binding of the document. Three (3) additional copies of all the Bond Forms, Bid Forms, and all required forms in Section 2016-1714 shall be provided. The three (3) copies may be bound by a staple or other manner as the bidder sees fit.

2. **Division 00 Bidding and Contract Requirements Section 2016-1703 – Bid Form:** Delete 'Section 2016-1703 – Bid Form' in its entirety for the Professional Services for the Colleton County Solid Waste Transfer Station and replace with the attached 'Section 2016-1703 – Bid Form', a copy of which is attached hereto and shall be used by all bidders.

3. **Division 00 Bidding and Contract Requirements Bid Bond Page 21:** Page 21 is missing its header. This page is the Bid Bond Form.

4. **Division 00 Bidding and Contract Requirements Section 2016-1714 Forms:** Whereas duplications of forms were found in the Bid Documents, the forms listed as Labor and Material Payment Bond (Pages 54-55) and Performance Bond (Pages 56-57) shall be deleted in their entirety.

5. **Division 01 General Conditions Part 13 Tests and Inspections:** Part 13 Tests and Inspections Section 13.03 (Pages 45-46). Whereas the document states that the contractor is responsible for all testing requirements, the contractor shall include in their bid an allowance of $30,000 for all required testing. These funds will be used at the discretion of the Owner. Prior approval of any Sub-contract for services pertaining to the testing requirements is required from the Construction Coordinator and the Owner. All unused fund for testing will be credited to the owner at the completion of the project unless otherwise directed by the Owner.

6. **Division 03 Site Work Section 02 30 00 Subsurface Exploration:** The Report of Geotechnical Exploration – Prepared for the Project by Whitaker Laboratory, Inc. dated March 31, 2016 for the Colleton County Solid Waste Transfer Station, South Carolina has been provided, a copy of which is attached hereto and shall be used by all bidders.

7. **Division 05 Earthwork Section 31 22 00 Grading:** Section 3.04 Soil Removal has been revised to state all unused soil shall remain on-site. The Owner will designate a location on-site to stock pile the unused soil. Division 05 Section 31 22 00 Grading should be deleted in its entirety and replaced with the revised Division 05 Section 31 22 00 Grading, a copy of which is attached hereto and shall be used by all bidders.

8. **Division 06 Exterior Improvements Section 32 31 13 Chain Link Fences and Gate:** Section 32 31 13 Chain Link Fences and Gates should be deleted in its entirety and replaced with the revised Section 32 31 13 Chain Link Fences and Gates, a copy of which is attached hereto and shall be used by all bidders.

9. **Clarification:** *½'' plate metal is called out on S3.1 and S3.2 and A501-1 for push walls. ¼'' plate metal is called out on A301 and A101 for push walls. Which detail is correct?* Push walls should be ½'' plate metal.

10. **Clarification:** *A501-2 details shows M10x8. Is this an "I" beam like the base plate detail shows? And if so, what size is it? What size anchors are required and what type? There is no spacing called out for this. How far from the edge of concrete does the M10x8 sit? What type of welds are required? A501-1 what weight is the W6?* The M10x8 is ½''x 6''x 12'' with six (6) 5/8'' x 10'' galvanized anchor bolts. The M10x8 sits twelve (12)-inches from angle to chute opening. ¼'' inch fillet welds are required. The weight of W6 is W6x9.

11. **Clarification:** *S3.1 shows the tipping floor and the walkway on the same elevation with the push wall footings thickened as one (1) continuous pour. A-501 shows two (2) elevations with a construction joint at the Push Wall. Which is correct?* The tipping floor is sloped and the walkway floor is level.

12. **Clarification:** *A501 shows the cantilevered edge flat. S3.1, S3.2, and S3.3 shows the edge sloped. Sloped how much? Which is correct? Structural Sheets S3.1, S3.2, and S3.3 are correct.*

13. **Clarification:** *S3.0 and S3.1 says to thicken slab at columns as required. Will there be a cold joint at these locations and will the thickened slab be reinforced and tied into the retaining wall? If so, what detail?* There will be a control joint at the slab interface. No additional reinforcing is required.

14. **Meeting Minutes – Mandatory Pre-Bid Conference:** The 'Meeting Minutes – Mandatory Pre-Bid Meeting' for Professional Services for the Colleton County Solid Waste Transfer Station in Colleton County, South Carolina, a copy of which is attached hereto, shall be used by all bidders.

15. **Pre-Bid Meeting Sign-In Sheet:** The 'Pre-Bid Sign-In Sheet' for Professional Services for the Colleton County Solid Waste Transfer Station in Colleton County, South Carolina, a copy of which is attached hereto.

Attachments:

- Section 2016-1703 – Bid Form – (2 Pages)
- Division 03 Site Work Section 02 30 00 Subsurface Exploration (38 Pages)
- Division 05 Earthwork Section 31 22 00 Grading (8 Pages)
- Division 06 Exterior Improvements Section 32 31 13 Chain Link Fence and Gates (4 pages)
- Meeting Minutes – Mandatory Pre-Bid Meeting' (3 Pages)
- Pre-Bid Meeting Sign-In Sheet (1 Page)

UNIT PRICE SCHEDULE

When changes in the work are ordered by the Owner, and such changes involve the following items, the following unit prices will be used to calculate adjustments to the Contract Sum. These unit prices shall be for the Work as specified, including all labor, materials, equipment, accessories, shipping, preparation, insurance, testing, overhead, profit, applicable taxes, permits, fees, warranties and all other associated costs for the finished and completed Work. All unit prices for utility conduits shall include sweeps, bends, couplings, caps, fittings, etc. which shall be included in the unit price per linear foot. Unit prices for undercut soils shall include material in place, surveyed and compacted pursuant to the Contract Documents.

Submit unit price and proposal amount for the following items. This list may not include all components necessary to provide a completed product, therefore any applicable items necessary to provide a completed product should be considered in your unit price response.

In case of errors in the extension of prices, unit price governs. In case of error in summations, corrected bid amounts will be totaled and will govern.

Contractor shall be responsible for all necessary electric and water hookups.

Contractor shall make quantity take-offs using drawings to determine quantities to his satisfaction, reporting promptly any discrepancies which may affect bidding.

This is not a comprehensive list of items included in the contract documents, and represents only a portion of the project total.

ARTICLE 5 – BASIS OF BID

Base Bid

5.01 Bidder will complete the Work in accordance with the Contract Documents for the following unit price(s):

Base Bid – Colleton County Solid Waste Transfer Station

Item No.	Description	Unit	Estimated Quantity	Unit Price	Bid Price
1	Mobilization/Bonds	LS	1	$	$
2	Construction Entrance/Exit	LS	1	$	$
3	Clearing/Grubbing	AC	1	$	$
4	Demolition of Existing Gravel	SY	5000	$	$
5	Demolition of Existing Concrete	SY	100	$	$
6	Demolition/Relocation of Existing Structures	LS	1	$	$
7	Relocation/Replacement of Concrete Partition Wall	LS	1	$	$
8	Testing/Inspection Allowance	LS	1		
9	Silt Fence	LF	400	$	$
10	Earthwork (On-Site Excavation/Backfill/Compaction)	LS	1	$	$
11	Earthwork (Import Soils/Backfill/Compaction)	LS	1	$	$
12	Unsuitable Materials Allowance (Assume 1000 CY)	CY	1000	$	$
13	Twelve (12)-Inch Graded Aggregate Base Course	SY	1175	$	$
14	Concrete Paving for Transfer Station Exterior Pad and Recycling Areas (6'' with Reinforcement)	SY	750	$	$
15	Six (6)-Foot High Chain Link Fence with 20-LF Gate	LF	200	$	$
16	Pipe Bollards	EA	19	$	$
17	Signage	LS	1	$	$
18	Drop Inlet	EA	2	$	$
19	Twelve (12)-Inch HDPE Storm Drainage Pipe	LF	120	$	$
20	Twenty-Four (24)-Inch RCP Storm Drainage Pipe	LF	105	$	$
21	One (1)-Inch PVC Water Line	LF	180	$	$
22	Six (6)-Inch PVC Trench Drain Pipe	LF	90	$	$
23	Electrical Conduit (4'' Diameter)	LF	150	$	$

24	Inlet Protection (Silt Saver Square Frame Assembly Model#S-200 A)	EA	2	$	$
25	Rip Rap Outlet Protection	SY	75	$	$
26	Erosion Control Matting (SC-150 North American Green)	SY	350	$	$
27	Grassing	AC	1	$	$
28	Ground Floor Slab and reinforcement	SY	140	$	$
29	Top Slab and reinforcement	SY	660	$	$
30	North Foundation Wall and Footings	LF	80	$	$
31	South Foundation Wall and Footings	LF	80	$	$
32	East Foundation Wall and Footings	LF	89	$	$
33	West Foundation Wall and Footings	LF	89	$	$
34	Interior Foundation Wall and Footings	LF	80	$	$
35	Push Wall	LF	80	$	$
36	Finish on Exposed Concrete	SF	8500	$	$
37	Metal Building Total	LS	1	$	$
38	Steel Stairs, Platforms, and Railing	LS	1	$	$
39	Trash Chute	LS	1	$	$
40	Painting	LS	1	$	$
41	Exhaust Fans Pipe Wire Switch and Fan	EA	3	$	$
42	Exterior Lighting By Personnel Doors	EA	4	$	$
43	Interior High Bay Lighting	EA	18	$	$
44	Interior Walkway and Misc Outlets	LS	1	$	$
			Total Base Bid:	**$**	

_____Dollars_____Cents ($_____)

The above unit prices shall include all labor, materials, bailing, shoring, removal, overhead, profit, insurance, etc., to complete the finish work as stipulated in the Bid Documents.

Bidder acknowledges that estimated quantities are not guaranteed, and are solely for the purpose of comparison of Bids, and final payment for all Unit Price Bid items will be based on actual quantities, determined as provided in the Contract Documents.

Base Bid Alternate 1

5.02 Bidder will complete the Work in accordance with the Contract Documents for the following unit price(s):

Alternate 1: Floor Slab Coating on area in front of Trash Chute

Item No.	Description	Unit	Estimated Quantity	Unit Price	Bid Price
1	BASF Anvil Top on the 15' Area in front of Trash Chute	SF	1200	$	$
			Total Alternate 1 Base Bid:	**$**	

Base Bid Alternate 2

5.03 Bidder will complete the Work in accordance with the Contract Documents for the following unit price(s):

Alternate 2: Floor Slab Coating on Entire Slab

Item No.	Description	Unit	Estimated Quantity	Unit Price	Bid Price
1	BASF Anvil Top on the entire slab	SF	6400	$	$
			Total Alternate 2 Base Bid:	**$**	

Bidder acknowledges that estimated quantities are not guaranteed, and are solely for the purpose of comparison of Bids.

Geotechnical Engineering Report

Proposed Colleton County Transfer Station Improvements
SC Hwy. 303, Colleton County, SC
March 31, 2016
Report No. 3-31-16-2

Prepared For:

Alliance Consulting Engineers, Inc.
Columbia, SC

Prepared By:

Whitaker Laboratory, Inc.
Savannah, Georgia

WHITAKER LABORATORY, INC.

P.O. Box 7078 2500 Tremont Road Savannah, Georgia 31418
(912) 234-0696 Fax (912) 233-5061 Email: info@whitakerlab.net

March 31, 2016

Alliance Consulting Engineers, Inc.
Post Office Box 8147
Columbia, SC 29202-8147
Tel: (803) 779-2078

Attention: Mr. Ryan T. Ohmer, EIT, LEED Green Associate
E-Mail: rohmer@allianceCE.com

Referencing: Report of Geotechnical Evaluation Services
Colleton County Transfer Station Improvements
SC Hwy. 303, Colleton County, SC
Report No.: 3-31-16-2

Dear Mr. Ohmer:

As requested, WHITAKER LABORATORY, INC. has conducted a geotechnical investigation at the above referenced site. Authorization to perform this investigation was provided by your acceptance of our proposal dated March 8, 2016. Our findings and recommendations for design and construction are attached and it is important that you read the report in its entirety.

It is a pleasure to provide our services to you and we look forward to further opportunities to assist you on this and other projects.

Respectfully submitted,
WHITAKER LABORATORY, INC.

Jason H. Follo, P.E.
SC Registered Engineer
#20225

Joseph M. Whitaker
President

516061rpt

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REPORT OF GEOTECHNICAL INVESTIGATION
Colleton County Transfer Station Improvements
SC Hwy. 303, Colleton County, SC

I. INTRODUCTION / SCOPE

WHITAKER LABORATORY, INC. has completed this field investigation of the surface and subsurface conditions at this site. The preliminary conditions found, and how those conditions could affect the design and construction of foundations for the structures planned, form the basis for this report. Regardless of the thoroughness of any geotechnical investigation, there are limitations, and deviations from the conditions found in this investigation could be subsequently disclosed. We recommend that this report be provided to all parties involved in the planned development to include but not necessarily limited to the Owner, Architect, Design Engineers, General Contractor and sub-contractors. Unanticipated circumstances often arise during sitework, earthwork and foundation construction. Accordingly, we recommend that our firm be retained to provide the construction surveillance, inspection, and testing on the project, thereby being readily available to assist in the evaluation of any conditions encountered that differ from those anticipated.

The site is located at the existing Colleton County Landfill site located on SC hwy. 303 just South of Walterboro, SC. We understand that a new transfer station building and associated trash shoot is planned for construction at the existing landfill site.

In an effort to evaluate subsurface soil conditions and their impact on the design and construction of the planned structure, a total of three soil test borings and three cone penetration test (CPT) soundings were performed within the general construction area. Borings/soundings were advanced to depths ranging from 10 to 30 feet below the ground surface.

Please note that this evaluation only applies to the foundations planned for construction. This evaluation does not apply to any future improvements, which may be made to the site. In particular, if at any time should additional fill be placed, adjacent to or nearby the structures referenced in this report, additional geotechnical borings and a follow up geotechnical analysis will be required. Standard billing rates will apply for this work.

II. EXECUTIVE SUMMARY

The following recommendations shall be considered a summary of the recommendations contained within this report and utilized as such. This report shall be read in its entirety.

The encountered surface soils can be made suitable for shallow spread pier and/or strip footing foundations with slab-on-grade construction if the following conditions are met and/or are acceptable to the owner and/or structural design:

- Surcharge loading shall be performed, prior to foundation construction, if finished floor slab elevations reside higher than 4 feet above existing grades.
- Foundation loads do not exceed 50 kips per column and strip loads do not exceed 2 kips per linear foot.
- The recommendations within this report are performed and verified during construction.

At any time, we will be glad to discuss the contents of this report. This includes insuring that you fully consider potential problems for design and construction procedures in respect to interpretations of the data.

III. PROJECT INFORMATION & DESCRIPTION

We have not been provided foundation loads for the building, however for the purpose of this report we will assume that foundation loads will not exceed 50 kips for columns and/or 2 kips per linear foot for walls.

We understand that current site plans require finished floor slab elevations residing 12 feet above existing grades within the building pad area. We further understand that the rear (trash shoot area) and right side of structure will incorporate a stern wall/retaining wall type foundation system to accommodate an approximate 10-foot grade separation between finished grade elevations of the ground surface along the exterior of the building and finished grade elevations for the building pad slab-on-grade.

Item	Description
Proposed Improvements	Transfer station structure
Finished floor elevation for slabs-on-grade	12 feet above existing grades
Maximum Foundation loads	Assume 50 kips for columns and 2 kips for walls
Maximum Floor Loads for slabs-on-grade	Assume 150 pounds per square foot
Maximum allowable settlement	Assume 1 inch overall and ½ inch differential
Above information was assumed by Whitaker Laboratory, Inc.	

If our assumptions are incorrect, we should be contacted immediately, provided the correct information and allowed an opportunity to change and/or modify the recommendations contained within this report if necessary.

IV. SITE LOCATION & DESCRIPTION

Item	Description
Location	US Hwy. 303, Walterboro, Colleton County, SC
Existing Structures	None within planned construction area
Current ground cover	Open gravel area
Existing topography	Generally flat within planned construction area

At the time of our site visit, the planned construction area consisted of an open graveled area with generally flat ground surface topography. The planned construction area was accessible and the ground surface was stable to our rubber tire drilling equipment.

V. AREA GEOLOGY

This project is located on the south side of Walterboro in Colleton County, SC. This overall project area lies near the eastern edge of the South Atlantic Coastal Plain. In South Carolina and Georgia, this broad, gently sloping region extends southeastward from the Fall Line (Chesterfield - Columbia - Augusta - Macon - Columbus) to the Atlantic Ocean. The soils encountered are sedimentary in origin, and consist of layered marine deposits of sands, silts, and clays. These deposits have since been subjected to successive erosion and re-deposition, by fluctuations of sea levels, storm tides, and winds. Many of the surface sands are the result of depositional forces along ancient beaches, which formed during the changing shoreline and river conditions. Intermittent deposits of shells occur within the strata at irregular intervals. The surface soils in a majority of this Coastal Plain area were deposited during the Pleistocene Era, however surface soils near the coast are likely of the Holocene Era.

VI. TEST BORINGS AND SUBSURFACE CONDITIONS

The field exploration to determine the characteristics of the subsurface materials included a reconnaissance of the project site, the drilling of exploratory borings and the advancement of an electronic cone penetrometer.

Standard penetration test borings were performed using rotary head drilling equipment and advancing hollow stem augers. Sampling and Standard Penetration Testing, (SPT), was performed in accordance with ASTM D-1586. SPT samples were taken at 2.5-foot intervals of depth for the first 10 feet, and at 5.0-foot intervals thereafter. Standard Penetration Testing is done with a 140-pound hammer falling 30 inches and a 2-inch diameter sampling spoon.

The electric cone penetrometer is utilized to perform Cone Penetration Testing (CPT). An electric cone attached to the end of a series of rods is pushed into the ground at a constant rate and nearly continuous measurements are made of the resistance to penetration on the cone. Load cells (bonded strain gauges) build inside the electronic cone record end bearing, qc, and friction sleeve stress, fs as the cone is being pushed into the ground.

Both the Cone Penetration Test (CPT), and the results of the Standard Penetration Testing (SPT N values) provide an indication of the relative consistency, density and in-situ strengths of the tested soils.

Soil samples from SPT testing and from the auger cuttings have been used for identification and visual classification. The subsurface stratification and the profile as presented in the boring logs, represent approximate boundary lines between the strata and materials encountered. These boundary lines are usually gradual and not clearly defined, and it is sometimes difficult to record changes in stratification precisely. It should be noted that underlying soil conditions can, and do, vary considerably within short lateral distances. It is possible that conditions may be revealed between boring locations that are different from those found by our borings and used for our analysis.

Soil behavior types identified within CPT logs are generated from the data collected during the CPT test and are based upon the soil classification chart for standard electronic friction cone (adopted from Robertson and Campanella UBC - 1983). The chart can be viewed within Appendix IV of this report.

The approximate locations of SPT borings and CPT tests are shown on the attached BORING LOCATION PLAN. Our field crews based on landmarks and features available at the time of work have estimated the test locations in the field. If the precise test locations are critical, this can be determined by employing a land-surveying firm to plot the true locations. Such survey should be completed promptly and before any disturbance to the area has occurred. If desired, WHITAKER LABORATORY, INC. will be glad to coordinate surveying arrangements for an additional fee.

Organic topsoil extended to depths reaching 5 inches below existing grades within borings B-2 and B-3. Near surface soils generally consist of gravel mix, (GM), silty sands (SM), sand clays (SC) and sands (SP-SM) extending to depths reaching 3 ½ feet below the ground surface. At a depth of 3 ½ feet, firm to stiff sand clays (SC) were encountered and extended to depths reaching 8 feet below existing grades. Below these sand clays, loose to very loose sands & silty sands (SP-SM and SM) and/or very soft to soft sand clays and clays (SC and CL) were predominately encountered extending to depths reaching 26 to 28 feet below the ground surface. At a depth of 28 feet, firm sands (SP-SM) were encountered and extended to the termination depth of the soundings at 30 feet below the ground surface.

The above description of the subsurface profile should be considered a general description intended to highlight the major strata encountered. More detailed profiles can be observed within the attached boring logs. Please note that boring logs are only representative of their location. Stratification transitions should be expected to occur outside and between boring locations. Taking into account that sampling was not performed on a continuous basis, lines drawn representing elevations of stratification changes shown on the boring logs were estimated.

VII. GROUNDWATER TABLE

The apparent ground water table was estimated at each boring location at the time of boring. Ground water was estimated to reside 2 to 3 ½ feet below the ground surface at the time of testing. The groundwater elevation can be expected to fluctuate with the season of the year, surrounding ground surface conditions, and with recent rainfall amounts. Thus, groundwater elevations indicated on the boring logs should be considered an approximation and valid only for the date of testing.

WHITAKER LABORATORY, INC. recommends that the contractor determine a groundwater level just prior to site work begins. We have addressed groundwater concerns within the earthwork and foundation design considerations section of this report.

VIII. SEISMIC SITE CLASSIFICATION AND COEFFICIENTS

Liquefaction Potential:

Whitaker Laboratory, Inc. performed a liquefaction analysis on the soils encountered within CPT-1. Liquefaction typically occurs when very loose to loose non-cohesive soils encountered below the groundwater table experience a significant loss of shear strength due to the increase in porewater pressure resulting from seismic vibrations.

The design earthquake utilized in our analysis (Charleston, SC earthquake with magnitude 7.3 and a 2% probability of exceedance in 50 years) yielded peak horizontal ground surface accelerations of 0.46g on this site. Based upon the design earthquake and characteristics of subsurface soils, the liquefaction analysis indicated that the encountered sand stratifications present below the groundwater table have potential to liquefy during the design seismic event. The amount of settlement estimated during and shortly after a seismic event of this magnitude approximated 1 to 1 ½ inches.

Settlements of this magnitude are not likely to cause significant damage to the structure, therefore liquefaction induced settlement should not be of concern in the design of this structure.

Seismic Parameters:

This site would be defined as a Site Class "D". The classification is determined by average soil properties in the top 100 feet of the soil profile, including standard penetration test N values, shear wave velocities, in-situ shear strengths and moisture contents, as specified by IBC 2012.

$S_s = 0.744$
$S_1 = 0.237$
$S_{MS} = 0.897$
$S_{M1} = 0.456$
$S_{DS} = 0.598$
$S_{D1} = 0.304$

A summary report is attached in Appendix III of this report. If the size and design of this structure justifies additional investigation, a Site Specific Geotechnical Investigation and dynamic site response analysis shall be performed. Our firm has the ability to provide our clients such testing and evaluation, and we will be available to discuss the cost, and potential benefit, if any, of such if you desire.

IX. EARTHWORK AND FOUNDATION DESIGN CONSIDERATIONS

With the current design requiring finished floor slab elevations residing 12 feet above existing grades, damaging settlement (overall settlement in excess of 2 inches) is expected to occur to the structure. In an effort to mitigate damaging settlements occurring to the structure, the building pad (plus 10 feet outside the perimeter) shall be surcharge loaded prior to utilizing shallow spread footing foundation elements for support of the structure.

If finished floor slab elevations can be lowered to a maximum of 4 feet above existing grades, surcharge loading would not be necessary due to anticipated settlements being within industry standard practice (one inch overall and ½ inch differential).

Therefore, the encountered surface soils can be made suitable for shallow spread pier and/or strip footing foundations with slab-on-grade construction if the following conditions are met and/or are acceptable to the owner and/or structural design:

- Surcharge loading shall be performed, prior to foundation construction, if finished floor slab elevations reside higher than 4 feet above existing grades.
- Foundation loads do not exceed 50 kips per column and strip loads do not exceed 2 kips per linear foot.
- The recommendations within this report are performed and verified during construction.

Earthwork:

- We recommend that all construction areas plus a minimum of 10 feet beyond the perimeter of all structural areas be stripped of any organics, stumps, roots and unsuitable surface soils. Stripping depths of 5 inches or more should be anticipated to remove all unsuitable surface soils.
- After stripping, the exposed subgrade soils should be thoroughly compacted in-place to 95% of ASTM-D-1557 and pass proof-rolling inspections prior to filling operations begin. Areas found to pump or deflect should be undercut to a competent material and backfilled with an approved compacted material. The exposed subgrade soils should be inspected, tested and approved by Whitaker Laboratory personnel prior to fill placement begins.
- All exposed subgrade soils shall be inspected, tested and approved by Whitaker Laboratory personnel prior to backfilling/filling placement begins.
- Backfill or fill material required to replace the stripped areas and to raise the pad area to achieve finished subgrade elevations, should consist of granular soils and be placed and compacted in accordance with the SITE WORK section of this report.
- Compaction efforts on all exposed subgrade soils and/or backfill and fill soil shall be made with a large vibratory smooth drum roller (Cat CS 74 or equivalent - centrifugal force range of 37,300 – 74,600 lb).

Surcharge Loading:

As mentioned above, surcharge loading shall be performed, prior to foundation construction, if finished floor slab elevations reside higher than 4 feet above existing grades.

Surcharge loading, also known as "pre-loading", in general, consists of adding sufficient weight "surcharge" to the building pad area utilizing compacted, stockpiled soil prior to construction. This surcharge loading will be in addition to the weight of any permanent structural fill placed on the site. The weight of the stockpiled soil will allow the very soft/very loose soils to consolidate/compress. Once it is determined that the subsurface soils have consolidated/compressed fully under the weight of the permanent fill and stockpiled soil, the stockpiled soil can be removed and the building can be constructed.

Site preparation performed in accordance with the above earthwork and below SITE WORK RECOMMENDATIONS sections of this report shall precede all surcharge construction.

Any permanent structural fill designed to remain beneath the completed structure shall be placed, compacted and tested also in accordance with the SITE WORK RECOMMENDATIONS section of this report.

After completion of the permanent fill, **an additional surcharge fill thickness of 5 feet shall then be constructed on top of the permanent fill**. This additional surcharge fill should extend a minimum of 10 feet outside the building limits. Vertical concrete block walls can be utilized 5-feet off the perimeter of the building pad (these space saving blocks are typically utilized at concrete plants to separate aggregate stockpiles) if site constraints will not allow sloping of the fill & surcharge load soil. Compaction of the surcharge fill shall be to 90% Standard Proctor Density (minimum of 100 pounds per cubic foot).

Settlement monitoring plates shall be installed within the mass of the permanent fill and extended above the surface of the surcharge fill (See attached detail). Settlement readings shall be made and recorded during the construction of the surcharge fill, and at one-week intervals after completion of fill.

The surcharge fill shall remain in-place until settlement readings indicate total consolidation of the site, and continuing rate of consolidation, has reached an acceptable level. The removal of the surcharge fill shall be when and as directed by the geotechnical engineer. It is estimated that the surcharge will remain in-place 60 to 90 days, but the decision to remove the fill will be based on the data collected from the settlement monitoring plates.

Once surcharge loading is deemed complete by the geotechnical engineer of record, shallow foundation systems with slab-on-grade flooring may be utilized to support the structure.

Foundations:

Once footings are excavated, soils exposed within the bottom of footing excavations should be re-compacted to meet 95% ASTM D-1557. Footing inspections shall also be conducted by performing dynamic cone penetrometer testing within bottom of footing excavations to verify bearing subgrade soils are stable enough to accept foundation loads. Subsurface bearing soils deemed unsuitable based upon dynamic cone penetrometer testing should be undercut to a competent material and backfilled with an approved compacted material.

Once the above is completed and verified by Whitaker Laboratory personnel during construction, individual spread footings, strip footings, or bearing edges of slabs-on-grade should be designed to bear in compacted or re-compacted virgin soils, structural backfill or fill as outlined above. Soil bearing pressures of 1500 PSF may be used. Any individual or strip footing should have a minimum plan dimension of 24 inches. Bearing elevations of foundations should reside at least 12 inches below finished grade and above the groundwater table. Even after surcharge loading, long term overall settlements on the order of one inch and differential settlements on the order of ½ inch should be expected.

Groundwater:

Please note that the groundwater table was encountered 2 to 2 ½ feet below the ground surface on this site. Dewatering measures may be required during the compaction process of exposed subgrade soils within bottom of retaining wall footings.

Typically the groundwater level needs to be 24 inches below subgrade elevations to properly compact the subgrade and/or subsequent backfill materials. Although dewatering techniques consisting of well point systems, sump pits with pumps, and/or drainage ditches are typically effective methods to lower groundwater, the means and methods for dewatering should ultimately be the responsibility of the contractor.

Retaining Wall / Stern Wall Foundation:

Soil parameters provided in the below table should be used for the design of the retaining wall/stern wall foundation system. Soil parameters provided below are contingent upon all fill being placed in 8 to 10 inch thick, loose lifts and compacted by conventional compaction equipment to 95% density in accordance with ASTM D-1557. All of the fill for this project should consist of a clean, free draining granular soil. The fill should be free of objectionable roots, clay lumps, organics and other debris. Soils classified as SP, SP-SM or SM with a maximum of 15% passing a #200 sieve may be acceptable.

Soil Classification For Backfill	Approximate Soil Unit Weight (pcf)		Internal Friction Angle (degrees)	Cohesion (psf)	Earth Pressure Coefficients		
	Sat	Submerged			Active, K_a	Passive, K_p	At Rest K_o
SP-SM & SM	115	52.6	30	0	0.33	3.0	0.45

Being that surcharge loading occurs prior to foundation construction (including construction of retaining wall / stern wall), fill soil will extend beyond the footprint area of the retaining wall structure. In order to construct the retaining wall structure, the recently placed permanent fill residing within the building pad area will have to be sloped back on a minimum 1:1 (horizontal to vertical) slope. After construction of the retaining wall, this wedge of soil must be backfilled in accordance with the site work recommendations section of this report. The wall shall be designed to handle compaction efforts behind the wall. If compacted #57 stone is utilized as backfill, the stone shall be wrapped in filter fabric.

For "worst case" design conditions where positive drainage is not provided or is temporarily interrupted, hydrostatic pressure will have to be added to the earth pressure on the wall. Whitaker recommends the design incorporate under drains on the building pad side of the wall to relieve any potential for hydrostatic pressure buildup on the wall.

X. SITE WORK RECOMMENDATIONS

We will be pleased to discuss these recommendations with the owner and the site work contractor selected to do the work. We believe it will be beneficial to the project, for the owner and the contractor to have a clear understanding of our recommendations.

1. Prior to construction, all building areas, plus at least 10 feet on each side and all areas to be paved, should be stripped of all vegetation, topsoil and root systems. Site drainage during construction should be considered prior to this clearing and stripping. Preventing the ponding of storm water is of particular importance.

2. Topsoil, organics, root-mat and other surface materials will likely vary across the site. Individual test borings may not accurately reflect the presence of, or the thickness of such materials due to site variability and/or surfacing clearing to facilitate access for drilling equipment. Site clearing and grubbing, when unsupervised, and particularly in areas of wet soils and times of wet weather, may push organic debris into otherwise stable soils. Undercutting and clearing with a track hoe in lieu of bulldozers can minimize this.

3. Any stump holes or other depressions should be cleared of loose material and debris, and should then be back-filled with approved fill. The backfill should be placed in 6-inch thick lifts and compacted to 95% density in accordance with ASTM D-1557.

4. Any existing utilities that underlie the site should be relocated and their trenches back-filled with approved soil. The backfill should be placed in 6-inch lifts and compacted to 95% density according to ASTM D-1557.

5. Prior to fill placement, the subgrade should be proof rolled with a loaded dump truck to locate unstable or soft areas. Any unstable areas should then be investigated to determine the cause of the instability. If due to unsuitable soils, such as highly organic soils or soft clays, the areas should be undercut to firm soil and replaced with approved fill compacted in 6-inch lifts to minimum density of 95% in accordance with ASTM D-1557. If the instability is due to excess moisture in otherwise stable soil, the area should be drained and compacted to 95% density.

6. Any fill or backfill required to level or raise the site should be placed in 8 to 10 inch thick, loose lifts and compacted by appropriate compaction equipment to 95% density in accordance with ASTM D-1557.

7. All of the fill and backfill (including utility line backfill) for this project should consist of clean, free draining granular soils. The fill should be free of objectionable roots, clay lumps, organics and other debris. The fill should be readily compactable during placement. Soils classified as SW, SP, SP-SM or SM with a maximum of 15% passing a #200 sieve may be acceptable. Soils with the minus #200 fraction classified as MH, CH, OH, ML, CL or SC may be rejected. Soils with a maximum plasticity index of 25 and a maximum liquid limit 40 may be acceptable for use only beneath building pads which are situated well above the groundwater table with approval from the geotechnical engineer. Soils classified as SC or CL, exhibiting moisture sensitivity, soils with excessive clay content, or excessive moisture should not be used without approval from the geotechnical engineer. Approved sands will also need to be moisture conditioned as necessary to facilitate proper compaction throughout its entire depth. If utility trenches cannot be sufficiently dewatered to readily allow compaction of the specified pipe bedding material, then a class I (ASTM-D-2321) gravel or gravel mixture will be required.

8. To assist in reducing moisture beneath the structure, and to reduce the potential for mold growth, the site shall be graded and filled as necessary to direct drainage away from the structure. If sub drains are installed, these alone may not prevent moisture vapor beneath the structure that can cause mold growth. (Also refer to paragraph 10 below). Care must be taken to not place concrete on top of wet soils. For example, if fill or natural soils experience heavy rain, the soils should be properly drained and dried, prior to placement of concrete. Otherwise moisture migration through the slab will occur.

9. Compact all footing excavations and slab subgrades to a minimum density of 95% in accordance with ASTM-D-1557, prior to placement on concrete. The footing excavations, and all prepared slab subgrade, should be maintained in a dry and compacted condition until the concrete is placed. Areas that are softened by water or that are disturbed by construction activity should be re-worked, re-compacted, or appropriately repaired to the required bearing and density. If necessary, stone backfill or other corrective measures may be implemented to stabilize footings.

10. All slabs-on-grade should be supported on a minimum of 4-inches of granular, free-draining gravel or coarse sand to reduce moisture migration by capillarity. A vapor retarding membrane, overlying this granular base, is recommended to further reduce moisture migration into finished areas of the structure. Note that the use of these measures will not totally prevent moisture under or on top of slabs or beneath structures. (Also refer to paragraph 8 above).

11. Any footing excavations that are directly adjacent to the existing foundations should be done in small increments to avoid undermining them and causing a loss of support to the existing structure. If necessary, the excavations should be sheeted and braced or grouting should stabilize the soil in the immediate area.

XI. QUALITY CONTROL AND TESTING

Documented inspections and/or testing performed by Whitaker Laboratory personnel, at the following critical milestones during construction, will be required for the recommendations contained within this report to be validated:

Site Work:

- After site stripping: document and verify stripping depths are adequate. Also verify exposed subgrade soils are stable enough to receive backfill/fill placement. Provide recommendations for achieving stability if deemed necessary.

- During permanent fill placement: Perform density testing on each lift of fill soil.

Surcharge Loading:

- During installation of surcharge fill: Install settlement-monitoring plates; verify surcharge thickness and density is sufficient.

- After surcharge fill is in place: Monitor settlement and provide recommendation when surcharge fill can be removed.

Foundations:

- After footings have been excavated: Perform footing inspections to verify near surface bearing subgrade soils are suitable prior to placement of reinforcement steel or concrete.

At the appropriate time, please contact Whitaker Laboratory, Inc. for budgetary and scheduling purposes for the performance of the above required inspection and testing services.

We further offer concrete, asphalt, masonry, and structural steel inspections and testing. Whitaker Laboratory, Inc. also performs observational services for mold mitigation, including observation of installation of vapor retarding membranes, subdrains, overall site drainage, and regularly scheduled observations after construction of site and landscape drainage, and monitoring of humidity and moisture in slabs and basement walls.

XII. QUALIFICATIONS OF REPORT

Any recommendations or opinions offered in this report are based on our interpretation of the data obtained from this investigation. It should be noted that underlying subsurface and soil conditions can, and do, vary considerably within short lateral distances. Regardless of the thoroughness of any subsurface investigation, it is possible that conditions may be revealed between boring locations that are different from those found by our borings and used for our analysis. For this reason, we recommend that the site preparation and foundation construction for this project be monitored closely. If deviations of the soil conditions from those presented in this report appear, we will be glad to furnish any additional analyses and recommendations that may be required.

This report was made to investigate subsurface properties of the site and is not intended to serve as a wetlands survey, toxic mold assessment, or environmental site assessment. No effort has been made to define, delineate, or designate any area as wetlands or an area of environmental concern or contamination. Any references to low areas, poorly drained areas, etc. are related to geotechnical applications. Any recommendations regarding drainage and earthwork are made on the basis that such work can be permitted and performed in accordance with the current laws pertaining to wetlands, storm water runoff, and environmental contamination.

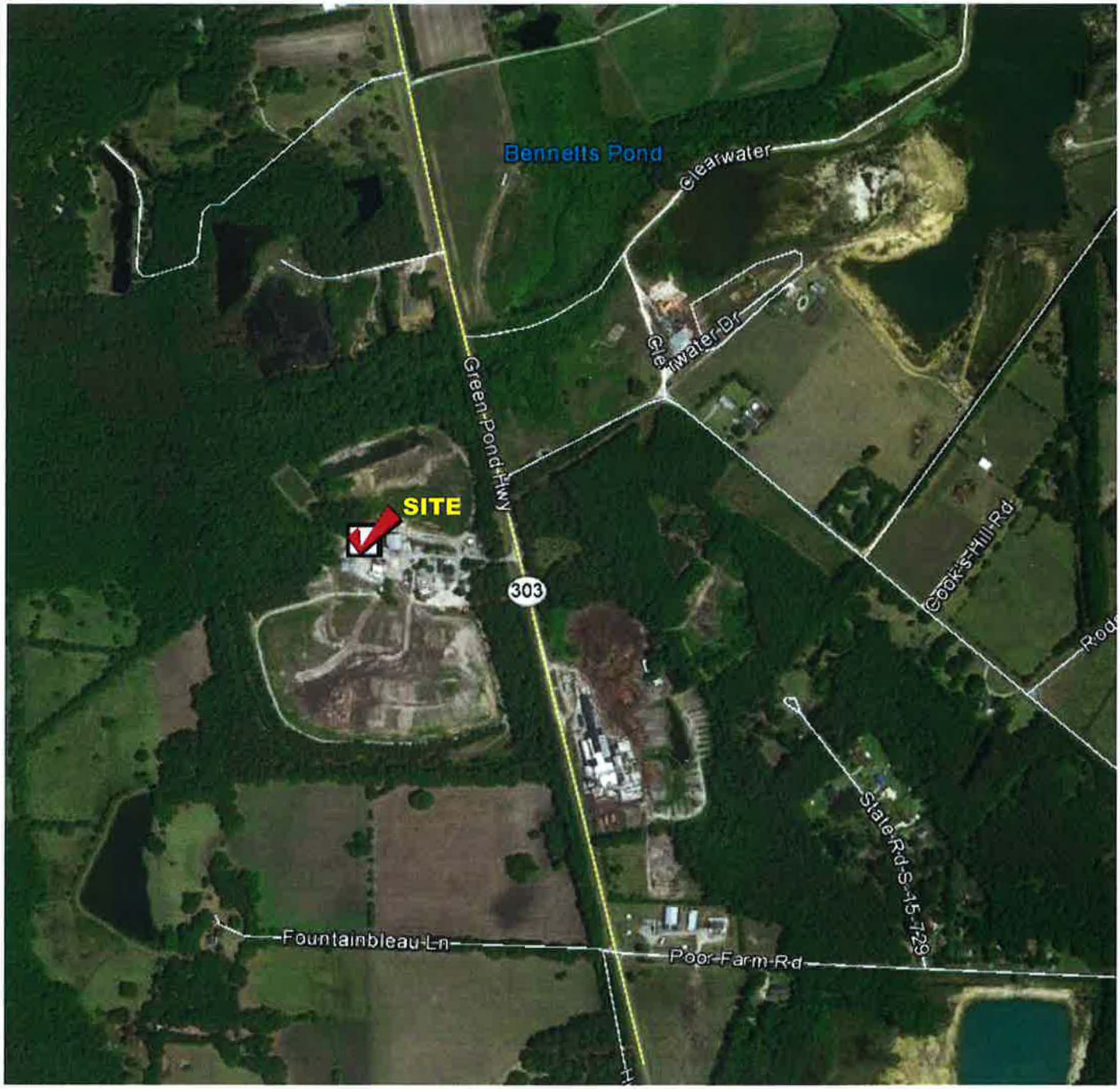
This report does not attempt to define or represent any FEMA, or otherwise designated, flood, erosion, scour, or other hazardous zones; nor does it presume to reflect that governmental or other authorities will grant approval of the project and issue appropriate permits.

WARRANT: WHITAKER LABORATORY, INC. and its professional engineers strive to perform all services in a manner consistent with that level of care and skill ordinarily exercised by members of the engineering profession practicing in the same locality and under similar conditions. No other warranty or representation, expressed or implied, is included or intended in this agreement, in any report, opinion, document, or otherwise. We carry commercial general liability insurance, including completed operations, and professional liability insurance in aggregate amounts deemed adequate, and we comply with the statutory requirements for workmen's compensation insurance. Accordingly, by accepting and relying on the contents of this report, the liability of WHITAKER LABORATORY, INC. and its professional engineers, to the client, owner, or any other party, for any loss or damage, resulting from any cause, including professional acts, errors, omissions, negligence, toxic mold and other environmental claims, breach of warranty or breach of contract, shall not exceed the total compensation received by us for services related to this project; and client will defend, settle, and discharge any claims or allegations of liability for same against us by others. If client desires higher monetary limits of our liability, we will be pleased to discuss such higher limits and the impact on liability and fees. In the event the client makes a claim against us, at law or otherwise, for any alleged act, error, omission, negligence, breach of warranty or breach of contract, arising from the performance of our services, it is mutually agreed that initially, the client and Whitaker Laboratory, Inc. will attempt to resolve such dispute through direct negotiations between the appropriate representatives of each party. Secondly, if such negotiations are not fully successful, the parties agree to resolve any remaining disputes by formal nonbinding arbitration mediation in accordance with the rules and procedures to be agreed upon by the parties. Mediation is a pre-condition to litigation. The exclusive venue for any disputes relating to Whitaker Laboratory's service shall be in Chatham County, GA. Furthermore, if the client fails to prove such claim, then client shall pay all costs accrued by us in defending ourselves.

TITLE: The ownership of opinions, technical ideas, methods and means, drawings, calculations, and other data developed by us during the course of preparing proposals or rendering engineering services remains exclusively with us. It is a condition of this report or proposal that the client agrees not to use the opinions, technical ideas, methods and means, drawings, calculations or any other data for projects or locations, other than those specifically addressed in the report, and that no one other than the client may use this report, without the written permission of WHITAKER LABORATORY, INC.

APPENDIX I

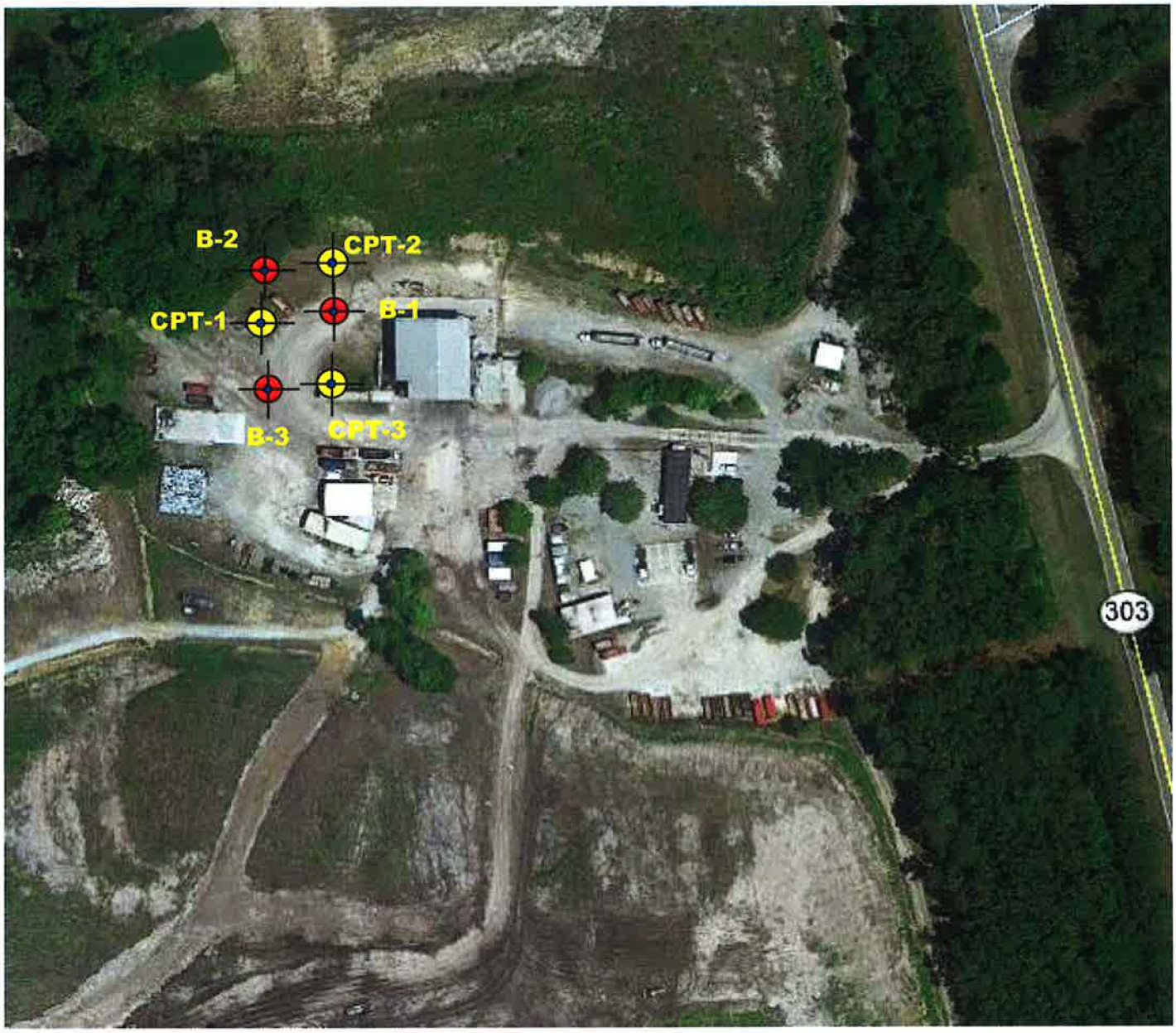
SITE & BORING LOCATION PLANS



Site Vicinity Map

Colleton County Transfer Station Improvements
SC Highway 303, Collecton County, South Carolina

N



Boring Location Plan

Colleton County Transfer Station Improvements
SC Highway 303, Collecton County, South Carolina

N

ALL BORING LOCATIONS ARE APPROXIMATE, & ARE BASED ONLY ON FIELD ESTIMATES.

APPENDIX II

BORING RECORDS

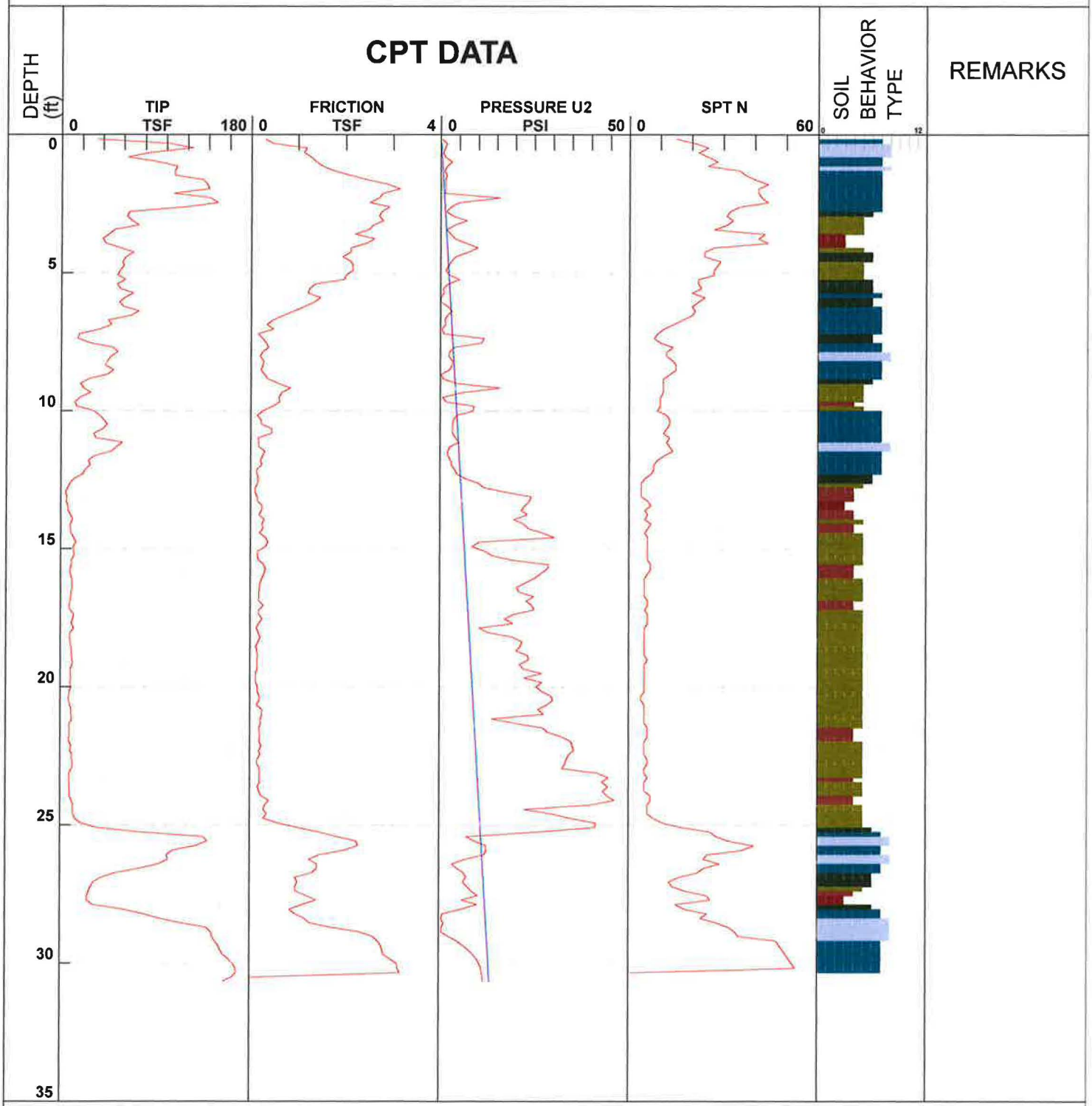
Whitaker Laboratory, Inc.

Job NamTransfer Stn. ImprovementsLocation Walterboro, SC Client Alliance Consulting Engineers

Date & Time3/25/2016 10:06:49 AM Hole Number CPT-1 Cone Number DSG1024

Operator Leach Job NumbeColleton County Landfill

Groundwater = 3 feet approx.



1 - sensitive fine grained
2 - organic material
3 - clay
4 - silty clay to clay
5 - clayey silt to silty clay
6 - sandy silt to clayey silt
7 - silty sand to sandy silt
8 - sand to silty sand
9 - sand
10 - gravelly sand to sand
11 - very stiff fine grained (*)
12 - sand to clayey sand (*)

Whitaker Laboratory, Inc. 2500 Tremont Road, Savannah, GA 31405 Phone: (912) 234-0696

Whitaker Laboratory, Inc.

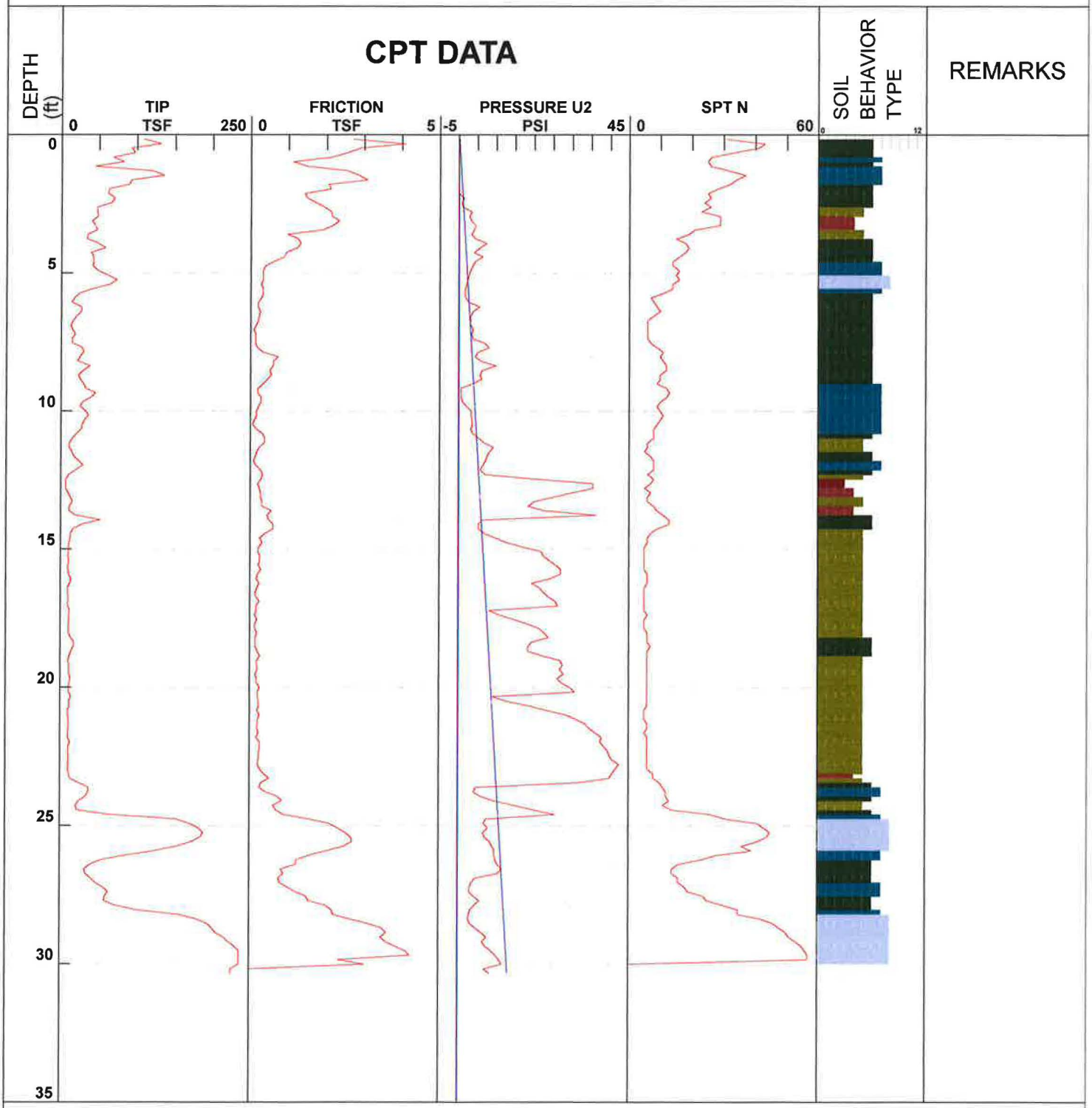
Job NamTransfer Stn. ImprovementsLocation Walterboro, SC Client Alliance Consulting Engineers

Date & Time3/25/2016 10:40:33 AM Hole Number CPT-2 Cone Number DSG1024

Operator Leach Job NumbeColleton County Landfill

Groundwater = 3 feet approx.

CPT DATA



1 - sensitive fine grained
2 - organic material
3 - clay
4 - silty clay to clay
5 - clayey silt to silty clay
6 - sandy silt to clayey silt
7 - silty sand to sandy silt
8 - sand to silty sand
9 - sand
10 - gravelly sand to sand
11 - very stiff fine grained (*)
12 - sand to clayey sand (*)

Whitaker Laboratory, Inc. 2500 Tremont Road, Savannah, GA 31405 Phone: (912) 234-0696

Whitaker Laboratory, Inc.

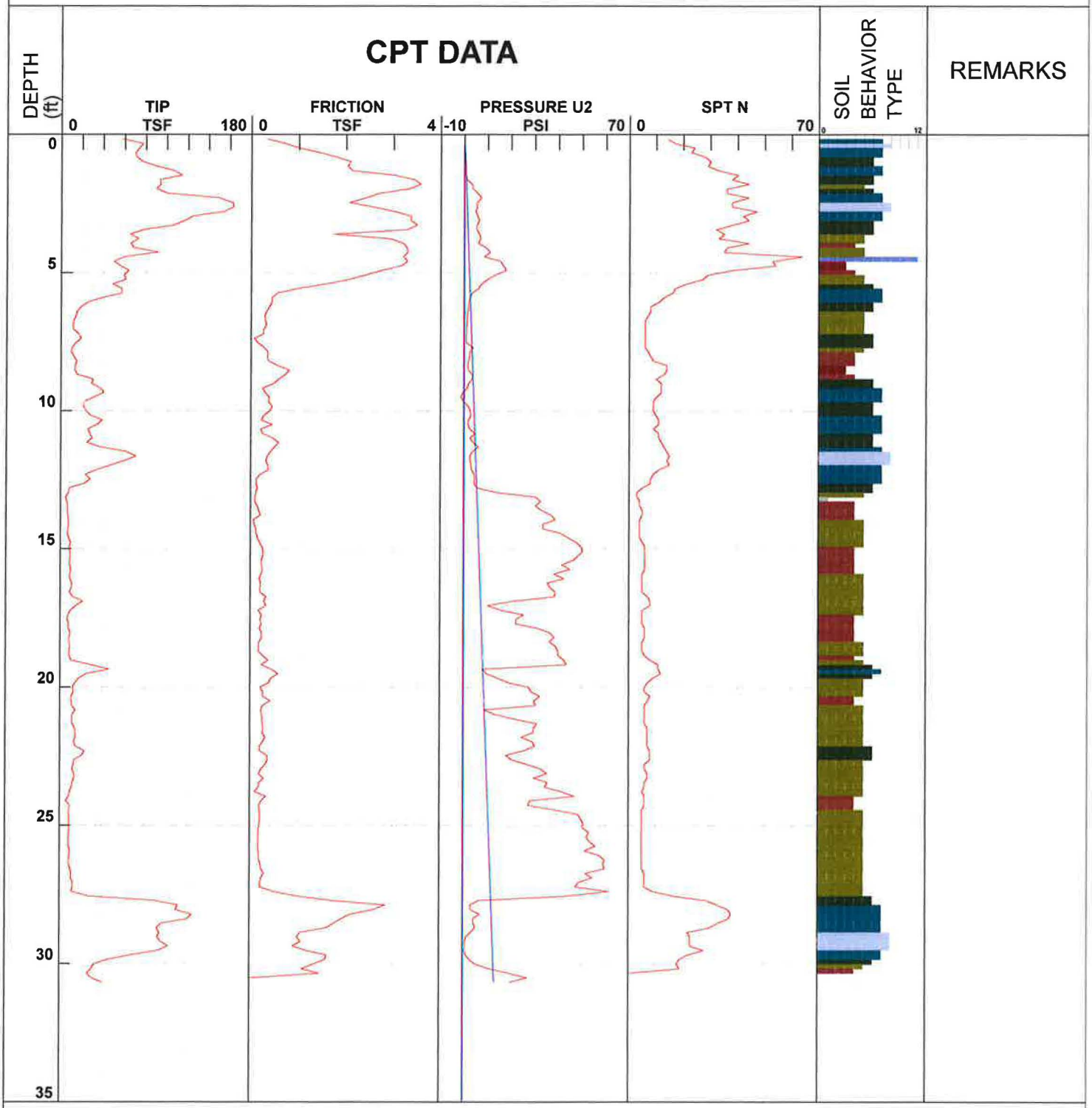
Job NamTransfer Stn. ImprovementsLocation Walterboro, SC Client Alliance Consulting Engineers

Date & Time3/25/2016 11:14:10 AM Hole Number CPT-3 Cone Number DSG1024

Operator Leach Job NumbeColleton County Landfill

Groundwater = 3 feet approx.

CPT DATA



1 - sensitive fine grained	4 - silty clay to clay	7 - silty sand to sandy silt	10 - gravelly sand to sand
2 - organic material	5 - clayey silt to silty clay	8 - sand to silty sand	11 - very stiff fine grained (*)
3 - clay	6 - sandy silt to clayey silt	9 - sand	12 - sand to clayey sand (*)

Whitaker Laboratory, Inc. 2500 Tremont Road, Savannah, GA 31405 Phone: (912) 234-0696

Client: Alliance Consulting Engineers, Inc.

Boring No. B-1

Project: Colleton County Transfer Station Improvements-SC Highway 303

Date: 3/25/16

Location: Colleton County, SC

Engineer: Follo

SUBSURFACE PROFILE		Sample					
Depth	Description	Depth	Number	Blows/ft	Standard Penetration Test blows/ft. 10 20 30 40 50 60 70 80 90	Water Table	Remarks
0	Ground Surface	0					
	GM Brown, clayey mix of soil, stone and rubble		1	10			
			2	13			
	SC Stiff to soft, orange medium to fine sand clay	5	3	9			
			4	4			
	SM-SC Very loose, orange fine clayey sand						
10	End of Borehole	10	5	2			
15		15					

Drilled By: Cody Leach

Drill Method: H. S. Auger

Drill Date: 3/25/16

WHITAKER LABORATORY, INC.
2500 Tremont Road
Savannah, GA 31405

Hole Size: 6.5"

Datum:

Sheet: 1 of 1

Client: Alliance Consulting Engineers, Inc.

Boring No. B-2

Project: Colleton County Transfer Station Improvements-SC Highway 303

Date: 3/25/16

Location: Colleton County, SC

Engineer: Follo

SUBSURFACE PROFILE		Sample					
Depth	Description	Depth	Number	Blows/ft	Standard Penetration Test blows/ft. 10 20 30 40 50 60 70 80 90	Water Table	Remarks
0	Ground Surface	0					
	SC Firm, orange fine sand clay		1	5			5" topsoil
			2	6			
	SC Firm, red-orange fine sand clay	5	3	8			
	SC Firm, orange fine sand clay		4	7			
	SM Very loose, orange fine silty sand						
10	End of Borehole	10	5	2			
15		15					

Drilled By: Cody Leach

Drill Method: H. S. Auger

Drill Date: 3/25/16

WHITAKER LABORATORY, INC.
2500 Tremont Road
Savannah, GA 31405

Hole Size: 6.5"

Datum:

Sheet: 1 of 1

Client: Alliance Consulting Engineers, Inc.

Boring No. B-3

Project: Colleton County Transfer Station Improvements-SC Highway 303

Date: 3/25/16

Location: Colleton County, SC

Engineer: Follo

SUBSURFACE PROFILE		Sample			Standard Penetration Test blows/ft. 10 20 30 40 50 60 70 80 90	Water Table	Remarks
Depth	Description	Depth	Number	Blows/ft			
0	Ground Surface	0					
	SP-SM Loose, brown fine sand		1	6			5" topsoil
	SP-SM Loose, tan medium to fine sand		2	6		▼	
	SC Stiff to firm, orange-tan fine sand clay	5	3	14			
			4	10			
10	End of Borehole	10	5	6			
15		15					

Drilled By: Cody Leach

Drill Method: H. S. Auger

Drill Date: 3/25/16

WHITAKER LABORATORY, INC.
2500 Tremont Road
Savannah, GA 31405

Hole Size: 6.5"

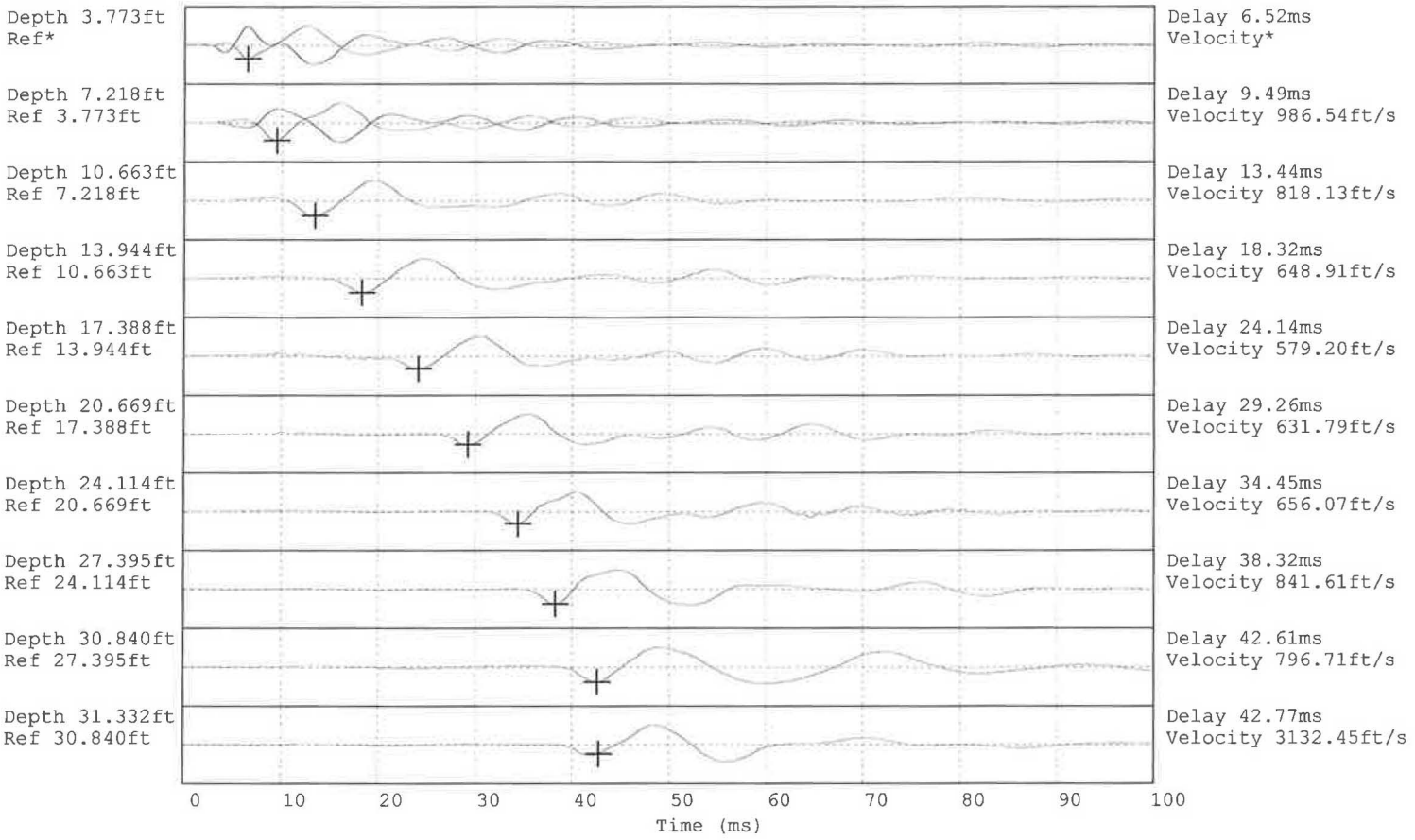
Datum:

Sheet: 1 of 1

APPENDIX III

SEISMIC SPECTRIAL PARAMETERS

Whitaker Laboratory, Inc.
CPT-2 - Colleton County Transfer Station



Hammer to Rod String Distance 1 (m)
* = Not Determined

Colleton County Transfer Station
Shear wave IBC Site Class
25-Mar-16

CPT-2 *ft*	VS *ft/sec*	Di/vs
4	600	0.00550000
7	986	0.00334686
11	818	0.00403423
14	648	0.00509259
17	579	0.00569948
21	631	0.00522979
24	656	0.00503049
27	841	0.00392390
30	796	0.00414573
34	600	0.00550000
37	600	0.00550000
40	600	0.00550000
44	600	0.00550000
47	600	0.00550000
50	600	0.00550000
54	600	0.00550000
57	600	0.00550000
60	600	0.00550000
63	600	0.00550000
67	600	0.00550000
70	800	0.00412500
73	800	0.00412500
77	800	0.00412500
80	800	0.00412500
83	800	0.00412500
87	800	0.00412500
90	800	0.00412500
93	800	0.00412500
96	800	0.00412500
100	800	0.00412500

0.14375307

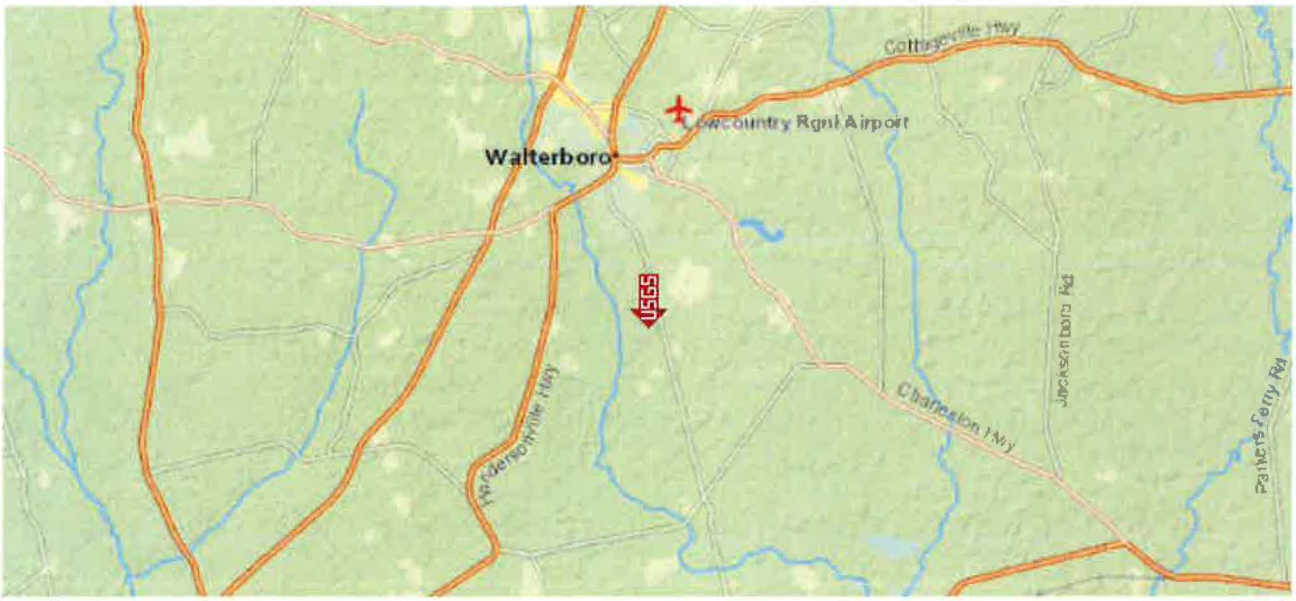
Weighted 696

Red values were conservatively assumed
Weighted VS between 600 - 1200 is site D

USGS Design Maps Summary Report

User–Specified Input

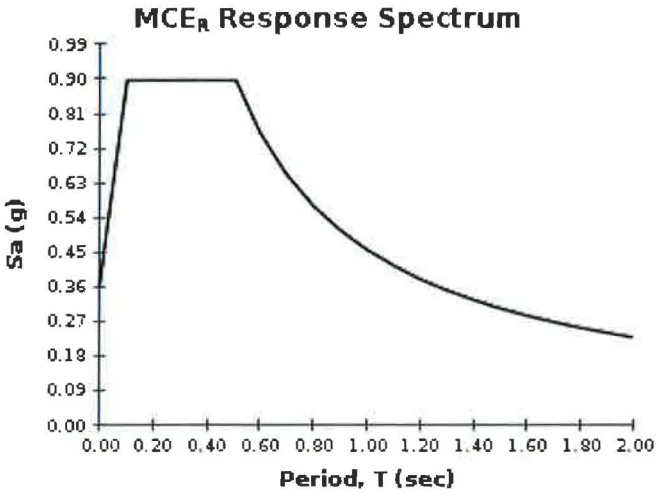
Report Title	Colleton County Transfer Station Thu March 31, 2016 17:40:41 UTC
Building Code Reference Document	ASCE 7-10 Standard (which utilizes USGS hazard data available in 2008)
Site Coordinates	32.85606°N, 80.65312°W
Site Soil Classification	Site Class D – "Stiff Soil"
Risk Category	I/II/III

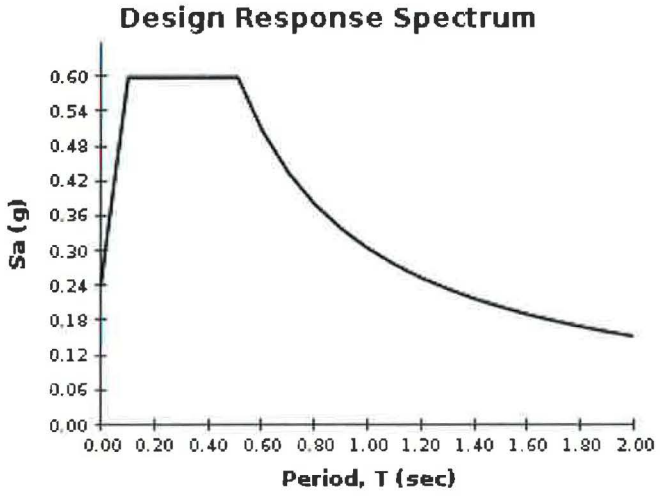


USGS–Provided Output

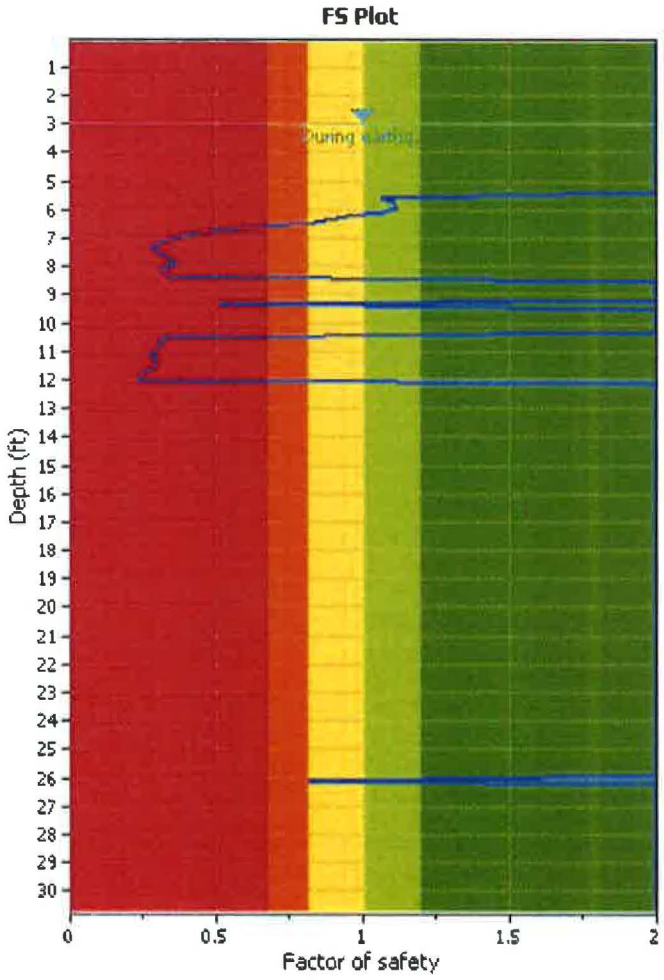
S_S =	0.744 g	S_{MS} =	0.897 g	S_{DS} =	0.598 g
S_1 =	0.237 g	S_{M1} =	0.456 g	S_{D1} =	0.304 g

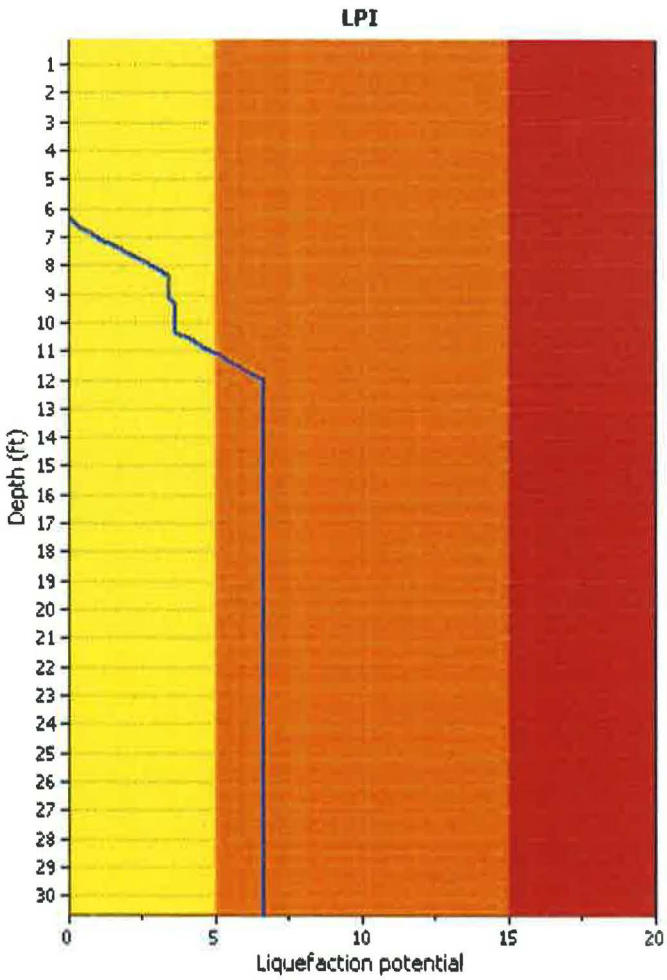
For information on how the SS and S1 values above have been calculated from probabilistic (risk-targeted) and deterministic ground motions in the direction of maximum horizontal response, please return to the application and select the "2009 NEHRP" building code reference document.

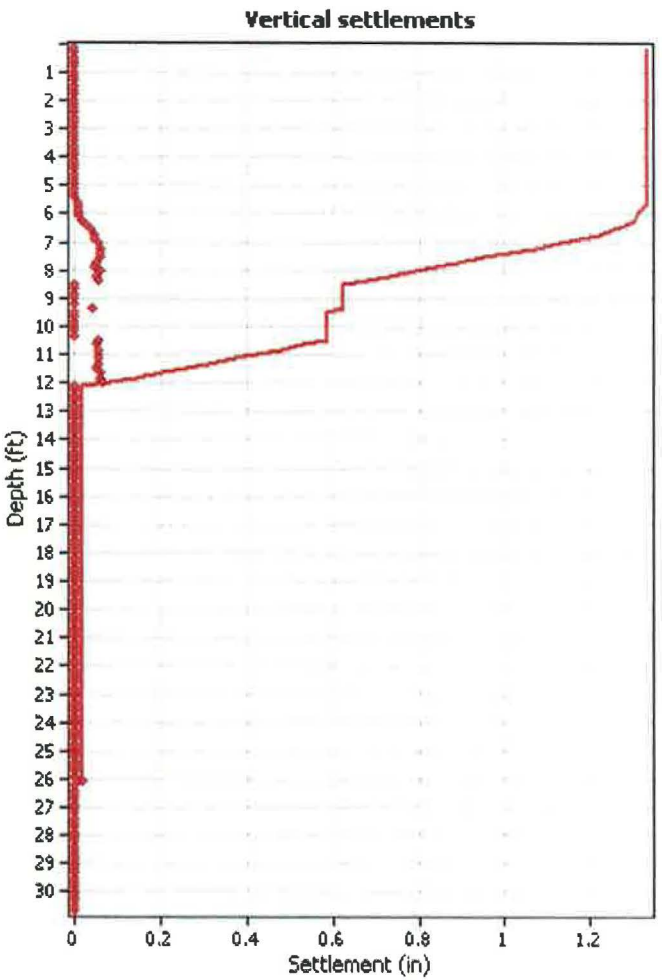




For PGA_M, T_L, C_{RS}, and C_{R1} values, please view the detailed report.

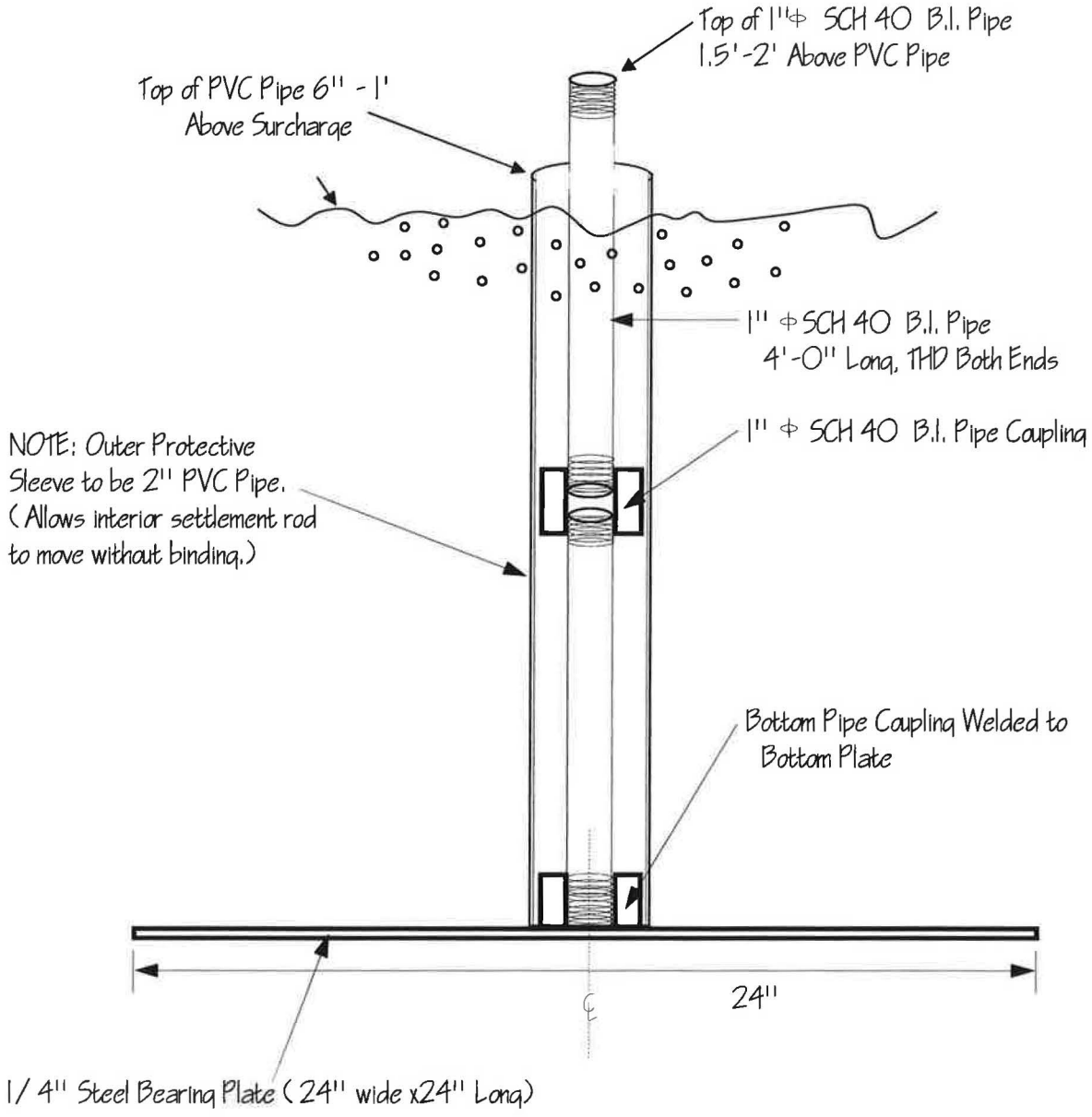

FS Plot
During Eating
Depth (ft)
Factor of safety
0
0.5
1
1.5
2


LPI
Depth (ft)
Liquefaction potential
0
5
10
15
20


Vertical settlements
Depth (ft)
Settlement (in)
0
0.2
0.4
0.6
0.8
1
1.2

APPENDIX IV

IMPORTANT GENERAL NOTES

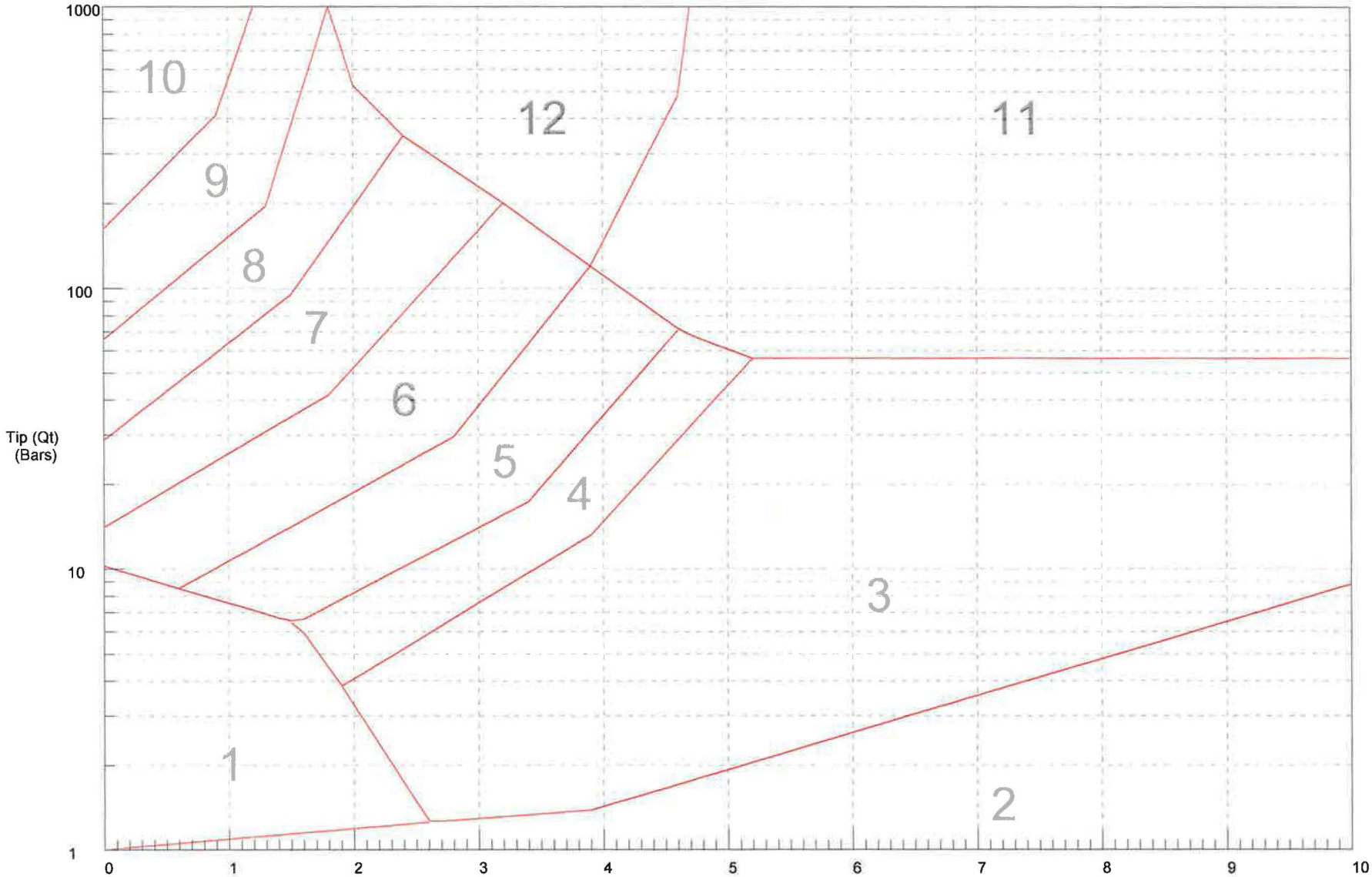


Typical Settlement Plate

Detail - Not to Scale

Whitaker Laboratory, Inc.

Classification Data:
Robertson and Campanella UBC-1983



1 sensitive fine grained
2 organic material
3 clay
4 silty clay to clay
5 clayey silt to silty clay
6 sandy silt to clayey silt
7 silty sand to sandy silt
8 sand to silty sand
9 sand
10 gravelly sand to sand
11 very stiff fine grained (*)
12 sand to clayey sand (*)

GENERAL NOTES

The "standard" penetration resistance is an indication of the density of cohesion less soils and of the strength of cohesive soils. The "standard" penetration test is measured with a 1.4 inch I.D., 2 inch O.D., sampler driven one (1) foot with a 140 pound hammer falling 30 inches.

RELATIVE DENSITY OF SOIL THAT IS PRIMARILY SAND

Number of Blows	Relative Density
0 - 4	Very loose
5 - 10	Loose
11 - 20	Firm
21 - 30	Very firm
31 - 50	Dense
Over 51	Very dense

CONSISTENCY OF SOIL THAT IS PRIMARILY SILT OR CLAY

Number of Blows	Consistency
0 - 2	Very soft
3 - 4	Soft
5 - 8	Firm
9 - 15	Stiff
16 - 30	Very stiff
Over 31	Hard

While individual test boring records are considered to be representative of subsurface conditions at the respective boring locations on the dates shown, it is not warranted that they are representative of subsurface conditions at other locations and times.

The subsoil stratification shown on these profiles is not warranted but is estimated based on accepted soil engineering principles and practices and reasonable engineering judgment.

Unless notified, samples will be disposed of after 60 days.

GROUP		
MAJOR DIVISIONS	SYMBOLS	TYPICAL NAMES
COARSE-GRAINED SOILS		
More than 50% retained on No. 200 Sieve*		
GRAVELS		
50% or more of coarse fraction retained on No. 4 sieve		
CLEAN GRAVELS	GW	Well-graded gravels and gravel-sand mixtures, little or no fines
	GP	Poorly graded gravels and gravel-sand mixtures, little or no fines
GRAVELS WITH FINES	GM	Silty gravels, gravel-sand-silty mixtures
	GC	Clayey gravels, gravel sand clay mixtures
SANDS		
More than 50% of coarse fraction passes No. 4 sieve		
CLEAN SANDS	SW	Well graded sand and gravelly sands, little or no fines
	SP	Poor graded sands and gravelly sands, little or no fines
SANDS WITH FINES	SM	Silty sands, sand-silt mixtures
	SC	Clayey sands, sand clay mixtures
FINE GRAINED SOILS		
50% or more passes No. 200 Sieve*		
SILTS AND CLAYS		
Liquid Limit 50% or less		
	ML	Inorganic silts, very fine sands, rock flour, silty or clayey fine sands
	CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays
	OL	Organic silts and organic silty clays of low plasticity
SILTS AND CLAYS		
Liquid Limit greater than 50%		
	MH	Inorganic silts, micaceous or diatomaceous fine sands or silts, elastic silts
	CH	Inorganic clays of high plasticity, fat clays
	OH	Organic clays of medium to high plasticity
HIGHLY ORGANIC SOILS	PT	Peat, muck and other highly organic soils

*Based on the material passing the 3 in. (75 mm) sieve.

SECTION 31 22 00

GRADING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Work included: Cut, fill, excavate, backfill, compact and grade the site as necessary to bring the roadway, Transfer Station Building Pad, and open areas to the lines and grades shown on the drawings.
   1. The work includes, but is not necessarily limited to:
      a. Roadway and Transfer Station Building Pad.
      b. Dressing of graded areas, and shoulders.
   2. Subsurface Classification: All excavation is unclassified and excavation of every description, regardless of material encountered within the grading limits of the project, shall be performed to the lines and grades indicated.

B. Removal and storage of topsoil.

C. Rough grading the roadway alignment and Building Pad.

D. Spread the topsoil and finish grading to slopes and open spaces.

1.02 RELATED REQUIREMENTS

A. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, and Sections in Division 02 of these specifications.

B. Section 02 30 00 - Subsurface Exploration

C. Section 01 89 13 - Site Preparation

D. Section 31 11 00 - Clearing and Grubbing

E. Section 02 41 00 - Demolition

F. Section 31 25 00 - Erosion and Sedimentation Control

G. Section 31 23 16 - Excavation

H. Section 31 23 23 - Fill and Backfill

I. Section 02 31 70 - Trenching for Site Utilities

J. Section 32 11 23 - Aggregate Base Courses

K. Section 02 92 10 - Grassing

1.03 DEFINITIONS:

A. Open areas: Open areas shall be those areas that do not include building sites, paved areas, street right-of-way and parking areas.

B. Maximum density: Maximum weight in pounds per cubic foot of a specific material.

C. Optimum moisture: Percentage of water in a specific material at maximum density.

D. Muck: Materials unsuitable for foundation because of organic content, saturation to the extent that it is somewhat fluid and must be removed by dragline, dredge or other special equipment, are designated as muck. No extra payment will be made for muck removal.

E. Unsuitable material: Unsuitable material is defined as earth material unsatisfactory for its intended use and as classified by the soils technician. In addition to organic matter, sod, muck, roots and rubbish, highly plastic clay soils of the CH and MH descriptions, and organic soils of the OL and OH descriptions, as defined in the Unified Soil Classification System shall be considered as unsuitable material.

F. Suitable material: Where the term suitable material is used in specification sections pertaining to earthwork, it means earth or materials designated as being suitable for their intended use by soils technicians or the Engineer. Suitable material shall be designated as meeting the

requirements of the Unified Soil Classification System types SW, GW, GC, SC, SM, ML, CL or as designated in these specifications.

G. Select material: Select material is defined as granular material to be used where indicated on the drawings or where specified herein consisting of soils conforming to the Unified Soil Classification types SW, SM, GW or GM or as otherwise approved by the Engineer as select fill. Select material shall contain no stones or rubble larger than 1-1/2-inches in diameter.

H. Crushed stone (gravel): Crushed stone shall be No. 57 aggregate or equal conforming to ASTM C-33.

I. Excavation: Excavation is defined as unclassified excavation of every description regardless of materials encountered.

1.04 SUBMITTALS

A. Project Record Documents: Accurately record actual locations of utilities remaining by horizontal dimensions, elevations or inverts, and slope gradients.

1.05 QUALITY ASSURANCE

A. Perform Work in accordance with the South Carolina Department of Transportation (SCDOT) standards.
   1. Maintain one copy on site.

B. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

C. Comply with requirements of governmental agencies having jurisdiction.

D. A testing laboratory retained by the Owner will make such tests as are deemed advisable. The Contractor shall schedule his work so as to permit a reasonable time for testing before placing succeeding lifts of fill material and shall keep the laboratory informed of his progress. The cost of the initial tests shall be paid for by the Owner. Subsequent tests required as a result of improper compaction shall be paid for by the Contractor.

1.06 PROJECT CONDITIONS

A. Protect above- and below-grade utilities that remain.

B. Protect bench marks, survey control points, existing structures, fences, sidewalks, paving, and curbs from grading equipment and vehicular traffic.

C. The Contractor must determine for himself the volume of material required by the site.

1.07 PRODUCT HANDLING

A. Comply with pertinent provisions of Section 01 60 00.

1.08 JOB CONDITIONS

A. Notification of intent to excavate:
   1. South Carolina Underground Utility Damage Prevention Act (S.C. Code Ann, 58-35-10, CT-SEQ, Supp. 1978) requires persons to ascertain the location of underground public utility property prior to excavation or demolition in certain situations. The Act also requires such persons to give timely notice of intent to excavate or demolish prior to commencing such operations. Failure to comply could subject the violator to a civil penalty of up to one thousand dollars ($1,000) for each violation of the Act.
   2. Notification of intent to excavate may be given by calling this toll free number: 811.

PART 2 PRODUCTS

2.01 SOIL MATERIALS

A. General:
   1. Soil material used as fill, backfill, subgrade for structures or pavements, embankments, or site grading shall consist of suitable material as found available on site until such supply of on-site material is depleted.

a. Provide suitable material free from organic matter and deleterious substances, containing no rocks or lumps over 6-inches in greatest dimension, and with not more than 15-percent of the rocks or lumps larger than 2-1/2-inches in their greatest dimension.
b. Do not permit rocks having a dimension greater than 1-inch in the upper 6-inches of fill or embankment.

2. Should the quantity of suitable on-site material be insufficient to complete the work, suitable borrow material as approved by the Engineer shall be provided by the Contractor at no additional expense to the Owner.
3. Select materials may be provided from on-site if acceptable material as approved by the Engineer is available on site. Otherwise approved select material shall be provided by the Contractor from an off-site source

B. Topsoil:
1. Use topsoil consisting of material removed from the top 3-inches to 6-inches of existing on-site soils.
2. Use topsoil containing no stones, roots or large clods of soil.
3. Stockpile topsoil separate from other excavated material.

C. Other Fill Materials:

2.02 WEED KILLER

A. Provide a dry, free-flowing, dust free chemical compound, soluble in water, capable of inhibiting growth of vegetation and approved for use on this work by governmental agencies having jurisdiction.

2.03 EQUIPMENT

A. Use equipment adequate in size, capacity and numbers to accomplish the work in a timely manner without undue waste or damage of material.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that survey bench mark and intended elevations for the Work are as indicated.

B. Surface Conditions:
1. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the work. Do not proceed until unsatisfactory conditions are corrected.

3.02 PREPARATION

A. Identify required lines, levels, contours, and datum.

B. Stake and flag locations of known utilities.

C. Locate, identify, and protect from damage above- and below-grade utilities to remain.

D. Notify utility company to remove and relocate utilities.

E. Protect site features to remain, including but not limited to bench marks, survey control points, existing structures, fences, sidewalks, paving, and curbs, from damage by grading equipment and vehicular traffic.

F. Protect trees to remain by providing substantial fencing around entire tree at the outer tips of its branches; no grading is to be performed inside this line.

G. Protect plants, lawns, rock outcroppings, and other features to remain as a portion of final landscaping.

H. Clearing and grubbing: Clear and grub areas to be graded prior to commencement of the grading operations.

I. Where so directed by the Owner, protect and leave standing designated desirable trees.

J. Complete any demolition and/or removal work as may be required prior to grading operations.

K. Dispose of all clearing, grubbing and demolition debris and other deleterious material off the project site. Vegetation, roots, brush, rubbish, stumps, etc. may be burned on-site where permitted by local authorities and regulations and approved by the Engineer.

L. Topsoil: Strip topsoil to a depth of 3-inches to 6-inches without contamination from the subsoil and stockpile topsoil separate from other excavated materials.
   1. Transport and deposit topsoil in storage piles convenient to areas that are to receive topsoil or in other locations as indicated or approved by the Engineer.
   2. Deposit topsoil in areas that are already graded and will not be disturbed by on-going construction.
   3. Dispose of unsuitable or unusable stripped material off-site or as otherwise directed by the Engineer.

M. Sampling and preliminary testing:
   1. Prior to beginning the grading operations, the Contractor shall submit to the Engineer his proposed sequence of excavation operations.
   2. Based upon the sequence of excavation, samples of the fill materials will be obtained as excavation proceeds and tested for grain size permeability and moisture density relationship using the Modified Proctor Method (ASTM D1557).
   3. Allow sufficient time for completion of laboratory tests before any fill operations begin, using the soils being tested.

3.03 ROUGH GRADING

A. Remove topsoil from areas to be further excavated, re-landscaped, or re-graded, without mixing with foreign materials.

B. Do not remove topsoil when wet.

C. Remove subsoil from areas to be further excavated, re-landscaped, or re-graded.

D. Do not remove wet subsoil, unless it is subsequently processed to obtain optimum moisture content.

E. When excavating through roots, perform work by hand and cut roots with sharp axe.

F. Perform excavating of every type of material encountered within the limits of the Work to the lines, grades and elevations indicated and specified herein.

G. Suitable excavated materials:
   1. Use all suitable materials removed from the excavation as far as practicable in the formation of the embankments, subgrades, shoulders, building sites and other places as directed.
   2. Unless otherwise indicated on the drawings or approved by the Engineer, surplus suitable material shall be removed from the site and disposed of by the Contractor.

H. Unsuitable excavated material: Remove from the site and dispose of all unsuitable material unless otherwise approved by the Engineer.

I. Unauthorized excavation:
   1. Excavation of material to depths below the grades indicated unless so directed by the Engineer will be deemed unauthorized excavation.
   2. Unauthorized over excavation shall be backfilled and compacted without any additional expense to the Owner.

J. In the event that it is necessary to remove unsuitable material to a depth greater than that shown on the drawings or otherwise specified, the Contractor, upon receiving direction from the Engineer, shall remove, replace and compact such material as directed by the Engineer at no additional expense by the Owner.

K. Filling and Backfilling
   1. Use fills formed of suitable material placed in layers of not more than 8-inches in depth measured loose and rolled and/or vibrated with suitable equipment until compacted.

2. Do not place rock that will not pass through a 6-inch diameter ring within the top 12-inches of the surface of the completed fill or rock that will not pass through a 2-inch diameter ring within the top 6-inches of the completed fill.
3. Do not use broken concrete or asphaltic pavement in fills.
4. Selection of borrow material:
    a. Material in excess of that available on the site shall be suitable material furnished by the Contractor from private sources selected by the Contractor. The material shall be approved by the Engineer before use. All expenses involved in securing, developing, transporting and placing the material shall be borne by the Contractor.

L. Placing and compacting:
1. Place backfill and fill materials in layers not more than 8-inches in loose depth.
2. Before compacting, moisten or aerate each layer as necessary to provide the optimum moisture content.
3. Compact each layer to required percentage of maximum density for the area.
4. Do not place backfill or fill material on surfaces that are muddy, frozen, or contain frost or ice.
5. Place backfill and fill materials evenly adjacent to structures, to required elevations.
6. Take care to prevent wedging action of backfill against structures by carrying the material uniformly around the structures to approximately the same elevation in each lift.

M. Moisture control:
1. Do not use soil material that is either too dry or too wet to achieve proper compaction.
2. Where subgrade or layer of soil material is too dry to achieve proper compaction, uniformly apply water to surface of soil material such that free water does not appear on the surface during or subsequent to compacting operations.
3. Remove and replace, or scarify and air dry, soil material that is too wet to permit compacting to the specified density.
4. Soil material that has been removed because it is too wet to permit compacting may be stockpiled or spread and allowed to dry. Assist drying by discing, harrowing, or pulverizing until moisture content is reduced to a satisfactory value as determined by moisture-density relation tests approved by the Engineer.

N. Compaction requirements:
1. Compact soils to not less than the following percentages of maximum dry density as determined in accordance with ASTM D1557 (Modified Proctor).
2. Beneath Roadways:
    a. Top 12-inches of Subgrade 95%
    b. All other fill material 90%
3. Embankments:
    a. Top 12-inches of Subgrade 95%
    b. All other fill material 90%
4. Lawns and unpaved areas:
    a. All other fill material 90%

O. See Section 31 23 23 for filling procedures.

P. Stability: Replace damaged or displaced subsoil to same requirements as for specified fill.

3.04 SOIL REMOVAL

A. Stockpile unused topsoil on site, Owner to designate stockpile location.

B. Stockpile unused subsoil on site, Owner to designate stockpile location.

3.05 FINISH GRADING

A. General:
1. Uniformly grade the areas within limits of grading under this Section, including adjacent transition areas.
2. Smooth the finished surfaces within specified tolerance.

3. Grade with uniform levels or slopes between points where elevations are shown on the drawings, or between such points and existing grades.
4. Where a change of slope is indicated on the drawings, construct a rolled transition section having a minimum radius of approximately 8-feet and 0-inches, unless adjacent construction will not permit such a transition, or if such a transition defeats positive control of drainage.

B. Before Finish Grading:
1. Verify building and trench backfilling have been inspected.
2. Verify subgrade has been contoured and compacted.

C. Remove debris, roots, branches, stones, in excess of 1/2 inch in size. Remove soil contaminated with petroleum products.

D. Grading adjacent to structures: Grade areas adjacent to buildings to achieve drainage away from the structures and to prevent ponding.

E. Ditches and gutters and swales:
1. Cut accurately to the cross sections, grades and elevations shown.
2. Maintain excavations free from detrimental quantities of leaves, sticks, trash and other debris until completion of the work.
3. Dispose of excavated materials as specified herein; do not in any case deposit materials within 3-feet and 0-inches of the edge of a ditch.

F. Upon completion of site grading and other related site work, topsoil shall be uniformly spread over the graded or improved areas. Topsoil shall be evenly distributed to conform to final grade elevations shown on the plans.

G. In areas where vehicles or equipment have compacted soil, scarify surface to depth of 3 inches.

H. Place topsoil to the following compacted thicknesses:
1. Areas to be Seeded with Grass not less than: 3 inches.
2. Areas to be Sodded: 4 inches.
3. Shrub Beds: 18 inches.
4. Flower Beds: 12 inches.

I. Place topsoil during dry weather.

J. Remove roots, weeds, rocks, and foreign material while spreading topsoil.

K. Near plants spread topsoil manually to prevent damage.

L. Fine grade topsoil to eliminate uneven areas and low spots. Maintain profiles and contour of subgrade.

M. Lightly compact placed topsoil.

N. Any surplus topsoil materials shall be disposed of in approved areas on the site.

3.06 TOLERANCES

A. Top Surface of Subgrade: Plus or minus 0.10 foot (1-3/16 inches) from required elevation.

B. Top Surface of Finish Grade: Plus or minus 0.04 foot (1/2 inch).

3.07 REPAIR AND RESTORATION

A. Existing Facilities, Utilities, and Site Features to Remain: If damaged due to this work, repair or replace to original condition.

B. Trees to Remain: If damaged due to this work, trim broken branches and repair bark wounds; if root damage has occurred, obtain instructions from Engineer as to remedy.

C. Other Existing Vegetation to Remain: If damaged due to this work, replace with vegetation of equivalent species and size.

D. Construct areas outside of building or structure lines true to grades shown.
1. Where no grade is indicated, shape finish surface to drain away from buildings or structures, as approved by the Engineer.

E. Degree of finish shall be that ordinarily obtainable from bladegrader, supplemented with hand raking and finishing.

3.08 FIELD QUALITY CONTROL

A. See Section 31 23 23 for compaction density testing and the following:

B. Secure the Engineer's construction review and observation and approval of subgrades and fill layers before subsequent construction is permitted thereon.

C. Field density determinations will be made, at no cost to the Contractor, to ensure that the specified densities are being obtained. Field density tests will be performed as determined by the Engineer, considering the following:
   1. At areas to receive paving, at least one field density test for every 5,000 sq. ft. of subgrade area, but not less than three tests.
   2. In each compacted fill layer, one field density test for every 5,000 sq. ft. of overlaying paved area, but not less than three tests.
   3. In fill beneath structures, one field density test for every 2,500 sq. ft. in each layer.
   4. Other tests as deemed necessary by the Engineer.

D. If, in the Engineer's opinion based on reports of the testing laboratory, subgrade or fills which have been placed are below specified density, provide additional compacting and testing until specified requirements are met.
   1. Additional testing will be provided by the Owner's selected testing laboratory and all costs for the additional testing will be borne by the Contractor.

E. Proofrolling:
   1. The Contractor shall proofroll subgrade of areas to receive paving, structures on fill or impervious lining material.
      a. Make not less than three (3) passes of a 25 to 50 ton rubber tired roller over the full area.
      b. Unstable, soft or otherwise unsuitable materials revealed by the proofrolling shall be removed and replaced with satisfactory materials, compacted as specified herein.

3.09 CLEANING

A. Remove unused stockpiled topsoil and subsoil. Grade stockpile area to prevent standing water.

B. Leave site clean and raked, ready to receive landscaping.

C. Existing utilities:
   1. Unless shown to be removed, locate and protect active utility lines shown on the drawings or otherwise made known to the Contractor prior to excavating. If damaged, repair or replace at no additional cost to the Owner.
   2. If active utility lines are encountered and are not shown on the drawings or otherwise made known to the Contractor, promptly notify the Engineer and take necessary steps to assure that service is not interrupted.
   3. If service is interrupted as a result of work under this Section, immediately restore service by repairing the damaged utility at no additional cost to the Owner.
   4. If existing utilities are found to interfere with the permanent facilities being constructed under this Section, immediately notify the Engineer and secure his instructions.
   5. Do not proceed with permanent relocation of utilities until written instructions are received from the Engineer.

D. Protection of persons and property:
   1. Barricade open holes and depressions occurring as part of this Work, and post warning lights on property adjacent to or with public access.
   2. Operate warning lights during hours from dusk to dawn each day and as otherwise required.
   3. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, washout and other hazards created by operations under this Section.

E. Use means necessary to prevent dust becoming a nuisance to the public, to neighbors, and to other work being performed on or near the site.

F. Maintain access to adjacent areas at all times.

G. Excavate and backfill in a manner and sequence that will provide proper drainage at all times.

3.10 MAINTENANCE

A. Protection of newly graded areas:
   1. Protect newly graded areas from traffic and erosion, and keep free from trash and weeds.
   2. Repair and re-establish grades in settled, eroded and rutted areas to the specified tolerances.

B. Where completed compacted areas are disturbed by subsequent construction operations or adverse weather, scarify the surface, reshape, and compact to the required density prior to further construction.

3.11 MEASUREMENT AND PAYMENT

A. The payment will be made at the unit price per “cubic yards” as stated in the Bid Form for Grading.

END OF SECTION

SECTION 32 31 13
CHAIN LINK FENCES AND GATES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Fence framework, fabric, and accessories.

B. Excavation for post bases; concrete foundation for posts.

C. Manual gates and related hardware.

1.02 RELATED REQUIREMENTS

A. Section 03 30 00 - Cast-in-Place Concrete: Concrete anchorage for posts.

1.03 PRICE AND PAYMENT PROCEDURES

A. Fencing: Measurement and payment by the linear foot, to the fence height specified, based on the specified post spacing. Includes posts, rails, tension wire, and, accessories.

B. Double Gates: Measurement and payment by each item. Includes frame posts, accessories, and hardware.

1.04 REFERENCE STANDARDS

A. ASTM A121 - Standard Specification for Metallic-Coated Carbon Steel Barbed Wire; 2013.

B. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2012.

C. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2009.

D. ASTM A392 - Standard Specification for Zinc-Coated Steel Chain-Link Fence Fabric; 2011a.

E. ASTM A428/A428M - Standard Test Method for Weight (Mass) of Coating on Aluminum-Coated Iron or Steel Articles; 2010.

F. ASTM A491 - Standard Specification for Aluminum-Coated Steel Chain-Link Fence Fabric; 2011.

G. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2011.

H. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength; 2012a

I. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete; 2013.

J. ASTM F567 - Standard Practice for Installation of Chain-Link Fence; 2011.

K. ASTM F668 - Standard Specification for Polyvinyl Chloride (PVC) and Other Organic Polymer-Coated Steel Chain-Link Fence Fabric; 2011.

L. ASTM F1043 - Standard Specification for Strength and Protective Coatings on Steel Industrial Chain Link Fence Framework; 2011.

M. ASTM F1083 - Standard Specification for Pipe, Steel, Hot-Dipped Zinc-Coated (Galvanized) Welded, for Fence Structures; 2010.

N. ASTM F1665 - Standard Specification for Poly(Vinyl Chloride)(PVC) and Other Conforming Organic Polymer-Coated Steel Barbed Wire Used with Chain-Link Fence; 2008 (Reapproved 2013).

O. CLFMI CLF 2445 - Product Manual; Chain Link Fence Manufacturers Institute; 1997.

1.05 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data on fabric, posts, accessories, fittings and hardware.

C. Shop Drawings: Indicate plan layout, spacing of components, post foundation dimensions, hardware anchorage, and schedule of components.

D. Manufacturer's Installation Instructions: Indicate installation requirements, post foundation anchor bolt templates.

E. Project Record Documents: Accurately record actual locations of property perimeter posts relative to property lines and easements.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years of documented experience.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Chain Link Fences and Gates:
   1. Master-Halco, Inc.; www.fenceonline.com.
   2. Merchants Metals; www.merchantsmetals.com.
   4. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 MATERIALS AND COMPONENTS

A. Materials and Components: Conform to CLFMI Product Manual.

B. Fabric Size: CLFMI Heavy Industrial service.

C. Intermediate Posts: Type I round.

D. Terminal, Corner, Rail, Brace, and Gate Posts: Type I round.

E. Gates: Swing Gate, See Construction Plans.

2.03 MATERIALS

A. Posts, Rails, and Frames: ASTM F1083 Schedule 40 hot-dipped galvanized steel pipe, welded construction, minimum yield strength of 30 ksi.

B. Posts, Rails, and Frames: ASTM A1011/A1011M, Designation SS; hot-rolled steel strip, cold formed to pipe configuration, longitudinally welded construction, minimum yield strength of 50 ksi; zinc coating conforming to ASTM F1043 Type B on pipe exterior and interior.

C. Posts, Rails, and Frames: Formed from hot-dipped galvanized steel sheet, ASTM A653/A653M, HSLAS, Grade 50, with G90 (Z275) zinc coating.

D. Wire Fabric: ASTM A392 zinc coated steel chain link fabric.

E. Barbed Wire: Zinc-coated steel, complying with ASTM A121 Type Z Coating Class 1; 2 strands of 0.099 inch diameter wire, with 2-pointed barbs at 4 inches on center.

F. Barbed Wire: Aluminum-coated steel, complying with ASTM A121; 2 strands of 0.099 inch diameter wire, with 4-pointed barbs at 3 inches on centers.

G. Barbed Wire: PVC-coated steel, complying with ASTM F1665; 2 strands of 0.099 inch diameter wire, with 2-pointed barbs at 4 inches on center.

H. Barbed Tape: Stainless steel, 0.025 inch thick x 1 inch wide, coil diameter of 24 inch, die stamped to produce 4 barbed points at 4 inch on center; cold clench over stainless steel core.

I. Concrete: Type specified in Section 03 30 00.

J. Concrete: Ready-mixed, complying with ASTM C94/C94M; normal Portland cement; 3,000 psi strength at 28 days, 3 inch slump; nominal size aggregate.

2.04 COMPONENTS

A. Line Posts: 2.5 inch diameter.

B. Corner and Terminal Posts: 3.0 inch.

C. Gate Posts: 3.5 inch diameter.

D. Top and Brace Rail: 1.66 inch diameter, plain end, sleeve coupled.

E. Gate Frame: 1.66 inch diameter for welded fabrication.

F. Fabric: 2 inch diamond mesh interwoven wire, 6 gage thick, top selvage knuckle end closed, bottom selvage twisted tight.

G. Tension Wire: 6 gage thick steel, single strand.

H. Tension Band.

I. Tension Strap.

J. Tie Wire: Aluminum alloy steel wire.

2.05 ACCESSORIES

A. Caps: Cast steel galvanized; sized to post diameter, set screw retainer.

B. Fittings: Sleeves, bands, clips, rail ends, tension bars, fasteners and fittings; steel.

C. Extension Arms: Cast steel galvanized, to accommodate 3 strands of barbed wire, single arm, vertical.

D. Hardware for Single Swinging Gates: 180 degree hinges, 2 for gates up to 60 inches high, 3 for taller gates; fork latch with gravity drop and padlock hasp; keeper to hold gate in fully open position.

E. Hardware for Double Swinging Gates: 180 degree hinges, 2 for gates up to 60 inches high, 3 for taller gates; drop bolt on inactive leaf engaging socket stop set in concrete, active leaf latched to inactive leaf preventing raising of drop bolt, padlock hasp; keepers to hold gate in fully open position.

F. Privacy Slats: Vinyl strips, sized to fit fabric weave.

2.06 FINISHES

A. Components (Other than Fabric): Galvanized in accordance with ASTM A123/A123M, at 1.7 oz/sq ft.

B. Components (Other than Fabric): Aluminum coated at 0.40 oz/sq ft, when measured in accordance with ASTM A428/A428M.

C. Components and Fabric: Vinyl coated over coating of 1.8 oz/sq ft galvanizing.

D. Hardware: Hot-dip galvanized to weight required by ASTM A153/A153M.

E. Accessories: Same finish as framing.

F. Color(s): To be selected by Engineer from manufacturer's standard range.

G. Color(s): Medium green.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install framework, fabric, accessories and gates in accordance with ASTM F567.

B. Place fabric on outside of posts and rails.

C. Set intermediate posts plumb, in concrete footings with top of footing 2 inches above finish grade. Slope top of concrete for water runoff.

D. Line Post Footing Depth Below Finish Grade: ASTM F567.

E. Corner, Gate and Terminal Post Footing Depth Below Finish Grade: ASTM F567.

F. Brace each gate and corner post to adjacent line post with horizontal center brace rail and diagonal truss rods. Install brace rail one bay from end and gate posts.

G. Provide top rail through line post tops and splice with 6 inch long rail sleeves.

H. Install center brace rail on corner gate leaves.

I. Do not stretch fabric until concrete foundation has cured 28 days.

J. Stretch fabric between terminal posts or at intervals of 100 feet maximum, whichever is less.

K. Position bottom of fabric 2 inches above finished grade.

L. Fasten fabric to top rail, line posts, braces, and bottom tension wire with tie wire at maximum 15 inches on centers.

M. Attach fabric to end, corner, and gate posts with tension bars and tension bar clips.

N. Install bottom tension wire stretched taut between terminal posts.

O. Install support arms sloped inward and attach barbed wire; tension and secure.

P. Do not attach the hinged side of gate to building wall; provide gate posts.

Q. Install gate with fabric and barbed wire overhang to match fence. Install hardware.

R. Provide concrete center drop to footing depth and drop rod retainers at center of double gate openings.

S. Install gate locking device.

3.02 TOLERANCES

A. Maximum Variation From Plumb: 1/4 inch.

B. Maximum Offset From True Position: 1 inch.

C. Components shall not infringe adjacent property lines.

3.03 MEASUREMENT AND PAYMENT

A. The payment will be made at the unit price “linear foot” as stated in the Bid Form for Chain link Fences and Gates.

END OF SECTION

Pre-Bid Meeting Proceedings
Colleton County Solid Waste Transfer Station in Colleton County, South Carolina
November 10, 2016 – 10:00 AM (Mandatory)

Pre-Bid Meeting Location:	Colleton County Landfill 3288 Green Pond Highway Walterboro, South Carolina 29488
Attendees:	Mr. John Stieglitz, Colleton County Ms. Carla Harvey, Colleton County Mr. Johnny Bartley, Colleton County Ms. Sylvia Singleton, Colleton County Mr. Sebastian White, IPW Construction Group, LLC Ms. Christina McAlhaney, Brantley Construction Company, LLC Mr. Jimmy Frank, Mitchell Construction Company Mr. Joe Hanson, Hitt Contracting Mr. John Leak, Leak and Associates, Inc. Mr. Cole Crosby, Wildwood Contractors, Inc. Mr. Ian Padgett, IP Builders, Inc. Mr. Kyle M. Clampitt, P.E., Alliance Consulting Engineers, Inc. Mr. Ryan T. Ohmer, E.I.T., Alliance Consulting Engineers, Inc.

The meeting was called to order at approximately 10:00 AM by Mr. John Stieglitz with Colleton County welcoming all in attendance, and introducing the members of Colleton County and Alliance Consulting Engineers, Inc. in attendance. Mr. Ryan Ohmer with Alliance Consulting Engineers, Inc. distributed the sign-in sheet for all attendees to sign. Mr. Stieglitz then proceeded to provide an overview the Bid Documents. Mr. Stieglitz noted that Colleton County has its own Contract Documents and stressed the importance of reading through the entire document. Mr. Stieglitz noted that there are forms at the back of the document that must be signed and submitted as part of the bid. Mr. Stieglitz explained that there are no federal funds associated with the project and that a Local and Minority Vendor Preference is in effect. The Vendor is considered Local if they have an office in Colleton County and pay taxes in Colleton County. Mr. Stieglitz stated that tipping and dumping fees will not be waived. The contractor is responsible for providing their own waste containers. Mr. Stieglitz stated that the scheduled start date for construction is January 2, 2017. Mr. Stieglitz then turned it over to Mr. Kyle Clampitt.

Mr. Clampitt then discussed the scope of work for the project. Mr. Clampitt continued by stating the parameters of the building as the scope was presented as an 80’ by 89’ pre-engineered metal building with interior concrete push walls clad with steel. The building will be utilized as a Transfer Station for the Colleton County Landfill. The building is equipped with a Trash Chute that is 15’ by 80’located at the northern portion of the building that funnels trash from the Transfer Station floor to a waste trailer located 15’ below.

Mr. Clampitt stated that these line items are based on Unit Prices and stressed the importance of completing the Bid Form as this is what the Contract would be based off. Mr. Clampitt stated that the deadline for Questions would be on November 15th at 4:00 PM. All questions should be sent via email to Mr. John Stiegltiz at jstieglitz@colletoncounty.org. Mr. Stieglitz would then forward the questions to the appropriate party. All answers to any questions will be provided to everyone who attended the Pre-Bid Meeting.

Mr. Clampitt discussed the bids are due Tuesday, November 22, 2016 at 11:00 AM in the Capital Projects and Purchasing Department located at 113 Mable T. Willis Boulevard.

Mr. Clampitt inquired if there were any questions regarding the proposed construction. The following questions were inquired and responded to as indicated below:

- Clarify which forms need to be filled out?
  - *An addendum will be sent out explaining which forms need to be filled out and provided with the bid submittals.*

- The Bid Documents state that the original copy needs to be signed as well as three (3) additional copies. Does the County require the entire document to be copied or just the forms that are to be signed?
  - *Colleton County requires one (1) complete bound original of the Bid Documents to be submitted along with three (3) sets of copies of the required forms.*

- What is the thickness of the steel for the concrete push wall?
  - *The concrete push wall is one-half (1/2) inch thick.*

- Does a Performance Bond have to be submitted with the Bid?
  - *No. A Bid Security must be submitted with the Bid but the Performance and Payment Bonds are only for after the Contract has been awarded.*

- The Bid Documents mention Third Party Inspections. Will this be provided by the County or is the Contractor responsible?
  - *An addendum will be issued regarding an allowance for Third Party Inspections. The Contractor is responsible for the inspections.*

- The Bid Documents reference Builders Risk Insurance. Is the Contractor responsible for providing this?
  - *The Contractor is required to provide Builders Risk Insurance. The County can be named as an additional insurer on the form but it is the Contractors responsibility to provide.*

- Is there a Geotech Report in the Bid Documents?
  - *An addendum will be issued providing the Geotech Report.*

- Will County move buildings that need to be relocated?
  - *It is the Contractor's responsibility to remove and/or relocate any buildings and this should be included in the price for Line Item 6.*

- Will there be any re-use of the existing gravel on-site?
  - *For bidding purposes, assume no re-use of existing gravel on-site.*

- Will spot elevations be provided?
  - *The DWG file has a surface that spot elevations can be taken from. The plans and DWG file also contain proposed and existing contours that can be used for earthwork calculations.*

- Will the construction budget be available to bidders?
  - *No, the construction budget will not be available to bidders.*

- Will the contractor be able to get into the site before or after the regularly scheduled working hours of the Solid Waste employees?
  - *Yes, the contractor will be provided with the gate code.*

- Whereas there is a Liquidated Damages time frame, is there a bonus for finishing the project ahead of schedule?
  - *No, there will not be a bonus for finishing the project ahead of schedule.*

- Is it the responsibility of the contractor to move the concrete block partition wall used for the tire recycling area?
  - *Yes, and the contractor will be required to place the wall back in its original location after the completion of work in this area. The Bid Form will be revised via an addendum to show a Line Item for Relocation/Removal of the Concrete Block Partition Wall.*

After the site tour and conclusion of the question period, the meeting was adjourned.

ALLIANCE
CONSULTING ENGINEERS

MANDATORY PRE-BID MEETING SIGN-IN SHEET

Project Name: Colleton County Solid Waste Transfer Station in Colleton County, South Carolina

Project No.: **15195-0015**

Bid No.: CPST-04

Meeting Location: 3288 Green Pond Highway
Walterboro, South Carolina 29488
(On Site)

Meeting Date: **Thursday November 10th, 2016 at 10:00 a.m.**

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NAME	COMPANY NAME	ADDRESS	Phone	Email
Sebastian Ulwick	IPW Construction Group LLC	7623 Dorchester Rd. N Charleston SC	843-308-0524	Cyrus.sinor@IPWLLC.com
CHRISTINA McALHANEY	BRANTLEY CONST CO. LLC	8300 DORCHESTER RD CHAS S.C	843-552-0150	CHRISTINA@BRANTLEYCONSTRUCTION.com
Jimmy Frank	Mitchell Const Co.	1807 Hampton St W'boro	843-549-7112	Construction@lowcont-g.com
Joe Hanson	HITT Contracting	2457 Aviation Ave N. Charleston SC 29406	843-200-7183	jhanson@hitt-gc.com
John LEAK	LEA/Land Associates Inc	1421 Old Pageland-Monroe Rd Monroe, NC 28112	704-291-2359	JohnLeak@leaLandassociates.com
Cole Crosby	Wildwood Contractors Inc	1706 Hampton St. Walterboro	8435494255	CCrosby@lowcountry.com
IAN PADGETT	IP BUILDERS INC	4472 JEFFERIES HWY WALTERBORO	843-908-0252	IPBUILDERS@YMAIL.COM
Coulter Harvey	Colleton County	113 Mabel T Willis, Walterboro 29488	843.782.3104	Charvey@colletoncounty.org

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