SECTION 00 9114 - ADDENDUM NUMBER 4

PARTICULARS

1.01 DATE: **October 18, 2013**

1.02 PROJECT: **Colleton County Shell Building 2**

1.03 PROJECT NUMBER: **C336**

1.04 OWNER: **Colleton County Economic Alliance, Inc.**

1.05 ARCHITECT: Carlisle Associates Inc.

TO: PROSPECTIVE BIDDERS

2.01 This Addendum forms a part of the Contract Documents and modifies the Bidding Documents dated 09/20/2013, with amendments and additions noted below.

2.02 Acknowledge receipt of this Addendum in the space provided in the Bid Form. Failure to do so may disqualify the Bidder.

2.03 This Addendum consists of two (2) pages and the following:

A. DOCUMENTS:
1. Table of Contents-R2 dated 10/18/2013.
2. Section 00 3101 - Available Project Information - Off-Site Report dated 10/18/2013.
3. Section 00 4321 - On-Site Unit Prices Form - Supplement A-R2 dated 10/18/2013.
4. Section 00 4322 - Off-Site Unit Prices Form - Supplement B-R2 dated 10/18/2013.
5. Section 03 4110 - Precast Insulated Structural Concrete Panels - R1 dated 10/18/2013.

B. DRAWINGS:
1. C336_Plan SK1 - ADD-4.
2. C336_Plan SK2 - ADD-4.

CHANGES TO ADDENDA

3.01 None.

CHANGES TO PROCUREMENT REQUIREMENTS

4.01 DELETE Table of Contents -R1 and INSERT Table of Contents-R2.

4.02 INSERT Section 00 3101 - Available Project Information - Off-Site Report

4.03 DELETE Section 00 4321 - On-Site Unit Prices Form - Supplement A-R1 and INSERT Section 00 4321 - On-Site Unit Prices Form - Supplement A-R2.

4.04 DELETE Section 00 4322 - Off-Site Unit Prices Form - Supplement B-R1 and INSERT Section 00 4321 - Off-Site Unit Prices Form - Supplement B-R2.

CHANGES TO THE CONTRACTING REQUIREMENTS

CHANGES TO THE SPECIFICATIONS

6.01 DELETE Section 03 4110 - Precast Insulated Structural Concrete Panels and INSERT Section 03 4110 - Precast Insulated Structural Concrete Panels-R1.

CHANGES TO THE DRAWINGS

7.01 INSERT Sketch C336_Plan SK1 - ADD-4 an Elevation Detail indicating reveal sizes.

7.02 INSERT Sketch C336_Plan SK2 - ADD-4 an Elevation Detail indicating reveal sizes.

CLARIFICATIONS

8.01 Clarification Section 00 2113 - Instructions to Bidders:

A. Paragraph 2.04.E states the Proposed Schedule of Values is due to the Owner at 4 pm ET on the Bid Date.

8.02 Clarification for Basis of Award:

A. Section 00 2113 - Instructions to Bidders attachment AIA Document A701 Article 5 Consideration of Bids, Section 00 2213 - Supplementary Instructions for Bidders, and Section 00 7400 Owner's General Instructions to Offerors delineate the basis of the award requirements.

8.03 Clarification of Section 03 4110 - Precast Insulated Structural Concrete Panels:

A. Intent of the Section is to provide thermally improved concrete panel with minimum thermal performance stated in the specification. Design shown was initially calculated to determine the minimum thickness to meet structural and thermal performance stated in the specification.

8.04 Clarification to 1/A201 & 2/A201:

A. Knock Out panels are outlined with a 3/8”x 3/8” continuous reveal.

8.05 Clarification to A300, A301, and A302:

A. All 1’-0” reveals are 3/8” deep and 1’-0” across the back surface. Chamfer top and bottom edges 45° maximum.

8.06 Clarification to Drawing S001:

A. S001 notes WIND LOAD 133 MPH for a Category Risk II building. Per IBC 2012, the Category Risk II building is located outside of the WIND BORNE REGION and the wind speed noted is less than the 140 MPH Ultimate Wind Speed. Therefore the project is not required to be rated for Large Missile Impact with regard to aluminum storefronts and glazing.

END OF SECTION

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SECTION 00 3101 - AVAILABLE PROJECT INFORMATION - OFF-SITE REPORT

PART 1 GENERAL

1.01 EXISTING CONDITIONS

A. Certain information relating to existing surface and subsurface conditions and structures is available to bidders but will not be part of the Contract Documents, as follows:

B. Geotechnical Report: Entitled Geotechnical Exploration Colleton County Commerce Center, Walterboro, South Carolina, S&ME Project No. 1131-13-429, dated September 21, 2013.

1. A copy of this report is attached to this Section.
2. This report identifies properties of below grade conditions and offers recommendations for the design of foundations, prepared primarily for the use of Architect.
3. The recommendations described shall not be construed as a requirement of this Contract, unless specifically referenced in the Contract Documents.
4. This report, by its nature, cannot reveal all conditions that exist on the site. Should subsurface conditions be found to vary substantially from this report, changes in the design and construction of foundations will be made, with resulting credits or expenditures to the Contract Price accruing to Owner.
5. Prior to bidding, bidders may make their own subsurface investigations to satisfy themselves as to site and subsurface conditions. Such investigations may be preformed only under time schedules and arrangements approved in advance by the Engineer.

1.02 QUALITY ASSURANCE

A. A soil engineer will be retained by the Owner to observe performance of work in connection with excavating, trenching, filling, backfilling and grading, and to perform compaction tests.

B. Re-adjust work performed that does not meet technical or design requirements.

C. Make no deviation from the Contract Documents without specific and written approval from the Engineer

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

GEOTECHNICAL EXPLORATION

COLLETON COUNTY COMMERCE CENTER
WALTERBORO, SOUTH CAROLINA
S&ME PROJECT NO. 1131-13-429

Prepared For:

URS
101 Research Drive
Columbia, South Carolina 29203

Prepared By:

S&ME
620 Wando Park Boulevard
Mt. Pleasant, South Carolina 29464

September 12, 2013

September 12, 2013

URS
101 Research Drive
Columbia, South Carolina 29203

Attention: Mr. Michael Lambrecht

Reference: **GEOTECHNICAL EXPLORATION**
Colleton County Commerce Center
Walterboro, South Carolina
S&ME Project No. 1131-13-429

Dear Mr. Lambrecht:

We are pleased to submit this Geotechnical Exploration report for improvements to the Colleton County Commerce Center in Walterboro, South Carolina. Our services were performed pursuant to S&ME Proposal No. 31-13-262 dated August 2, 2013. The purpose of our geotechnical services is to explore the site subsurface conditions for the planned construction, evaluate those conditions, and provide pavement design recommendations and limited geotechnical recommendations for site preparation and foundation design of future speculative buildings. This report presents our understanding of the project, the site and subsurface conditions encountered, and our conclusions and recommendations.

PROJECT INFORMATION

We understand improvements are planned for the Colleton County Commerce Center. Currently, the center is developed with one paved cul-de-sac (Industrial Park Road) and one building (speculative building 1). We understand new roads A and B will be constructed in the interior of the site and will support light industrial traffic within the Center. The existing frontage road (Clayton Lane) will be extended to the north to tie into McLeod Road. The new frontage road will provide access to Westvaco property to the south that will be developed with heavy industrial uses. Two more speculative buildings are planned for the Center, and two areas are being evaluated as possible storm water management pond locations. Specific structural information was not provided at the time of this report; however, we assume maximum column and wall loads will be range from about 100 to 150 kips and 3 to 4 kip/ft, respectively. We assume new fill heights of 2 ft or less will be required to grade the proposed building and roadway areas. If suitable, materials removed from the ponds would be used as controlled fill.

This project information was provided in a telephone conversation and subsequent email from Mr. Michael Lambrecht with URS to Mr. Michael Ulmer, P.E. with S&ME on July 29, 2013.

FIELD EXPLORATION

Our field exploration included a reconnaissance by a geotechnical engineer and the performance of nine cone penetration test (CPT) soundings and hand-auger borings. We also obtained three push tube samples at-depth and near-surface bulk samples for laboratory testing. The soundings were extended to depths of about 10 to 50 ft below the existing ground surface, and the hand-auger borings were extended to a depth of approximately 4 ft. The requested test locations are shown on Figure 1 in the Appendix. The test locations are approximate and were established in the field by S&ME personnel using a hand-held GPS. The table below presents which test locations are associated with each site feature.

Table 1- Summary of Test Locations for Each Site Feature

Feature	Borings	Test Locations
Roads	5	C-1, C-2, C-4, C-5, and C-7
Spec. Bldg. III	2	C-3 and C-6
Ponds	2	C-8 and C-9

A more detailed description of our field testing procedures, the CPT sounding logs, and hand-auger boring logs are also included in the Appendix.

LABORATORY TESTING

The push tube and bulk samples were subjected to laboratory natural moisture content, fines content, Atterberg limits, Modified Proctor, and California Bearing Ratio (CBR) testing. The testing was performed in general accordance with applicable ASTM standards. The results are presented on a summary sheet and individual data sheets in the Appendix. Table 2 summarizes the type and quantity of tests completed.

Table 2- Summary of Laboratory Test Quantity

Laboratory Test	Procedure	Total Number of Tests
Natural Moisture	ASTM D 2216	3
Atterberg Limits	ASTM D 4318	3
Grain Size Analysis	ASTM D 1140	3
Modified Proctor	ASTM D 1557	1
California Bearing Ratio	ASTM D 1883	1

SITE AND SUBSURFACE CONDITIONS

Site Conditions and Description

The site is the western half (Phase II) of a partially developed site known as the Colleton County Commerce Center. Phase II is bordered by McLeod Road to the north, undeveloped land to the south, Phase I of the Commerce Center to the east, and Interstate 95 to the west. The site was grassy with small tree saplings. Built up dirt and gravel roads traversed the site from east to west and north to south. Standing water was observed in throughout the site at the time of our exploration.

The topographic information on the drawing provided by URS indicates site elevations range from approximately +82 to +84 ft[1] and generally slope downwards away from the roads.

Subsurface Conditions

Details of the subsurface conditions encountered by the exploration are shown on individual logs in the Appendix. These logs represent our interpretation of the subsurface conditions based upon field data. Stratification lines on the logs represent approximate boundaries between soil types and soil behavior types[2]; however, the actual transition may be gradual. The general subsurface conditions and their pertinent characteristics are discussed in the following paragraphs.

The exploration initially encountered topsoil, crushed stone, and/or uncontrolled fill at various locations as indicated on the logs in the Appendix. It was difficult to discern the interface of fill soils and natural soils at the site. Beneath the surface materials, the subsurface conditions generally consisted of loose to dense sands with varying amounts of silt and clay to the final exploration depth of 50 ft below existing ground surface.

Groundwater

Groundwater water was measured upon completion of the soundings and hand-auger borings at depths from the ground surface to 4 ft below the existing ground surface. It is possible that the groundwater encountered at or near the ground surface were a result of the water perching within the clayey near surface soils. Groundwater levels at the site will fluctuate during the year due to seasonal and climatic variations and with construction activity in the area.

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[1] Datum not known.

[2] Soil Behavior Type is calculated based on empirical correlations with tip resistance, sleeve friction, and pore pressure. A CPT may define a soil based on its behavior as one type while its grain size and plasticity, the traditional basis for soil classification, may define it as a different type.

PRELIMINARY COMMENTS AND CONCLUSIONS FOR THE BUILDINGS

The preliminary comments and conclusions for the future speculative buildings submitted in this report are based, in part, upon data obtained from the widely-spaced test locations. Subsurface conditions between the test locations will vary, as will grading and construction details; therefore, only general comments about the suitability of the site for the anticipated development can be provided. Once final site development plans have been established, additional geotechnical exploration and analysis will be required at specific project locations to provide design recommendations for site preparation and structural support.

Based on the findings of the field exploration, the following preliminary comments and conclusions are provided:

1. ***Site Preparation.*** The near-surface soils at this site are clayey and have a low permeability (or percolation rate); therefore, there is a potential for rainwater to pond at or near the ground surface. Additionally, clayey soils are moisture sensitive and will rut under construction traffic when wet. Therefore, it is important that the site is graded so that rainwater runoff will be directed away from the proposed building and roadway areas. Prior to beginning site clearing, it is also important that site drainage be established. This can probably be accomplished by excavating gravity draining ditches across the site. The ditches will help create positive flow and direct shallow perched water and rainwater runoff away from the construction area. Depending on conditions at the time of construction, pumping from sumps may be required in low-lying areas.

   Site preparation should continue with clearing and grubbing vegetation and roots, stripping organic laden topsoil, and undercutting unsuitable surface soils. Stumps and taproots should be completely removed, and voids created should be cleaned and backfilled with well-compacted controlled fill. Prior to fill and pavement placement, the exposed subgrade in building and pavement areas should be proofrolled by a Geotechnical Engineer. Unstable areas can be stabilized as recommended by the Geotechnical Engineer. The extent and depth of any undercutting will be dependent will be heavily dependent on final grades; the climatic conditions during construction; the aggressiveness of the earthwork schedule, and the grading contractor's experience, equipment, means, and methods.

2. ***Seismic Considerations.*** A preliminary liquefaction[3] analysis based on the design earthquake[4] prescribed by the 2012 edition of the International Building Code (IBC 2012) indicates isolated sand zones between the water table and a depth of 50 ft have the potential

[3] Liquefaction, the loss of a soil's shear strength due to the increase in porewater pressure resulting from seismic vibrations, is always a potential concern in coastal South Carolina.

[4] The IBC design earthquake has a 2% probability of exceeding in 50 years. This is statistically equivalent to an event that occurs about once every 2,500 years. Our liquefaction analysis was based on an earthquake with a magnitude of 7.3 and ground surface acceleration of 0.47g.

to liquefy during the design seismic event, and approximately 2 in. of liquefaction-induced settlement is possible at this site.

Section 1613.3.2 of the IBC 2012 classifies sites with the potential for liquefaction as Seismic Site Class F. However, the IBC 2012 allows the design spectral response accelerations for a site to be determined without regard to liquefaction provided structures have a fundamental period of less than or equal to 0.5 seconds and the risks of liquefaction are considered in design. Based on the preliminary exploration, the site may be considered a Site Class D.

3. ***Foundations.*** Based on the limited exploration in the planned Speculative Building III area (soundings C-3 and C-6), the soils appear suitable for support of future buildings on conventional shallow foundations. Although the test locations are too widely spaced to provide final design values, it is anticipated that conventional shallow foundations can be designed for maximum allowable bearing pressures of about 2,000 to 2,500 psf for the building.

   The preliminary analysis indicates that total post-construction static settlement will be approximately 1½ in. or less due to the assumed building loads (i.e., 100 to 150 kips and 3 to 4 kips/ft) and 2 ft or less of new fill. Settlement should be more thoroughly assessed in a design geotechnical exploration tailored to the actual structural loads and fill heights. The hand-auger borings indicated uncontrolled fill encountered in some areas of the site; however, as previously stated, it was difficult to discern the interface of fill soils and natural soils at this site. Fill is inherently variable in nature, and some undercutting in isolated areas of the site should be anticipated.

4. ***Controlled Fill.*** Controlled fill material should be soil containing no more than 15% fines (material passing the No. 200 sieve) by weight, having a maximum dry density (ASTM D 1557) of at least 100 pcf, and having a Liquid Limit and Plastic Index of less than 40 and 5, respectively. The soil should be relatively free of organics, deleterious matter, and elongated or flat particles susceptible to degradation. Soils are typically placed in uniform lifts of 10 in. or less (loose measure) and compacted to at least 95% of the modified Proctor maximum dry density (ASTM D 1557).

5. ***Suitability of Site Soils for Fill Applications.*** Beneath the topsoil at the site, poorly-graded, clayey and silty sand with fines contents greater than 15% were encountered within the upper 15 ft. It is possible to use the clayey and silty sands as structural fill; however, they are more difficult to work with and typically require drying prior to placement and compaction. The practicality of using the clayey and silty sands as structural fill will depend upon the weather at the time of construction, and most importantly the contractor's construction techniques. The organic laden topsoil is not acceptable for use as structural fill, but may be used in landscaped areas.

PAVEMENT RECOMMENDATIONS

We have evaluated new flexible (asphalt) and rigid (concrete) pavements using the AASHTO *Guide for Design of Pavement Structures* and associated literature. Traffic loading data was not provided. Based on our experience with similar projects, we assume standard-duty pavement will be subjected primarily to cars and light truck traffic, and heavy-duty pavements will be subjected to heavier truck traffic. A rigid pavement section is recommended in areas subjected to repeated lateral loading (turning, stopping, and starting) and at dumpster pads, where at least the front wheels of the truck should be supported by the rigid pavement.

Based on our experience with near-surface cohesive soils (i.e., clayey sand and sandy clay), we recommend a CBR value of 5% for pavement design. Laboratory testing indicated a higher CBR value for the near-surface, silty sands at this site; however, the majority of the near-surface soils across the site are clayey and would not provide as high of a CBR value. If at least 2 ft of sandy, well-compacted controlled fill will be placed below pavements, a CBR of at least 10% may be used. Table 3 presents our recommendations for minimum pavement sections based on existing site soils and a CBR of 5%.

Table 3 – Minimum Recommended Pavement Sections

Material	Flexible Pavement		Rigid Pavement	
	Heavy Duty	Standard Duty	Heavy Duty	Standard Duty
Asphaltic Concrete Surface Course (SCDOT Type C)	3 in.	2 in.	-	-
Graded Aggregate Base Course	8 in.	6 in.	6 in.	6 in.
Portland Cement Concrete (f'_c = 4000 psi)	-	-	6 in.	5 in.

Our analyses indicate the standard duty flexible pavement section has an allowable traffic volume of about 44,000 ESALs[5] over a 15-year design life, and the allowable traffic volume for the heavy duty flexible pavement section is approximately 380,000 ESALs. Construction traffic has not been included in our analysis, and construction traffic should be restricted from prepared subgrades and new pavements. If new pavements must support construction traffic, a thicker section or staged construction should be used or the pavement life will be reduced.

All materials and workmanship should be in accordance with the South Carolina Department of Transportation's *Standard Specifications for Highway Construction*, 2007 Edition.

A stable subgrade is very important to pavement performance. Immediately prior to paving, the subgrade should be proofrolled, and any unstable areas should be repaired as discussed in the Site Preparation section of this report. The base course should be compacted to at least 100% of the maximum dry density as determined by the modified Proctor compaction test (ASTM D 1557).

[5] Equivalent 18-kip single axle load (ESAL). For example, a legally-loaded tandem axle tractor-trailer has an ESAL of up to 2.5, while a passenger car has an ESAL of approximately 0.0002.

In-place field density tests should be performed by a qualified Materials Technician, and the area should be methodically proofrolled under their evaluation to confirm that the base course has been uniformly compacted. The thickness should not be deficient in any area by more than ½ in. The asphalt pavement thickness should not be deficient by more than ¼ in. in any area.

The performance of asphalt and rigid concrete pavements will be dependent upon a number of factors including subgrade conditions at the time of paving, drainage, and traffic. Rainwater or irrigation runoff should not be allowed to seep below pavements. The pavement geometric design should provide positive drainage for the pavement surface and the subgrade.

Pavement design typically has relatively low factors of safety; therefore, it will be very important that the specifications are followed closely during pavement construction. Our analysis was based on a 15-year design life; however, some isolated areas could require repair in a shorter period of time.

LIMITATIONS TO REPORT

The report has been prepared in accordance with generally accepted geotechnical engineering practice for specific application to this project. The preliminary conclusions and recommendations contained in this report were based on the applicable standards of our profession in this geographic area at the time this report was prepared. No other warranty, express or implied, is made.

The scope of services provided in this report for future speculative buildings are considered sufficient for planning purposes; however, it is not sufficient for geotechnical design purposes. Once final site development plans have been established, additional field and laboratory test must be performed. This additional testing should include an appropriate number of CPT soundings or soil test borings and laboratory testing that would be used to provide design-level geotechnical recommendations.

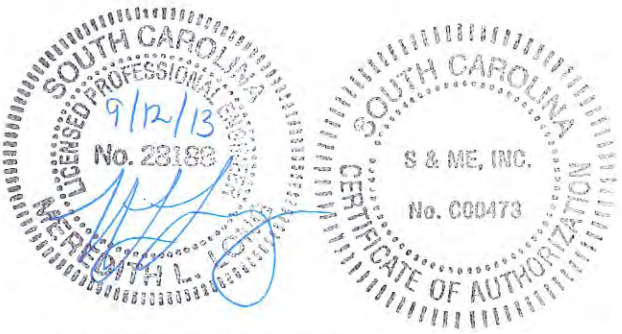
The analyses and recommendations submitted in this report for pavement design are based, in part, upon data obtained from our subsurface exploration. The nature and extent of subsurface variations will not become evident until construction. If variations appear evident, then we should be given the opportunity to re-evaluate the recommendations of this report. In the event that any changes in the nature, design, or location of the proposed roadways are planned, the conclusions and recommendations contained in this report will not be considered valid unless the changes are reviewed and conclusions modified or verified in writing.

CLOSURE

We sincerely appreciate the opportunity to be of service on this project. If you have any questions concerning this report, please don't hesitate to call.

Sincerely,

S&ME, Inc.



Meredith L. Long, P.E.
Project Engineer

Tracey R. Turner, P.E.
Geotechnical Department Manager

MLL/TRT/sln

Appendix

Test Location Plan (Figure 1)

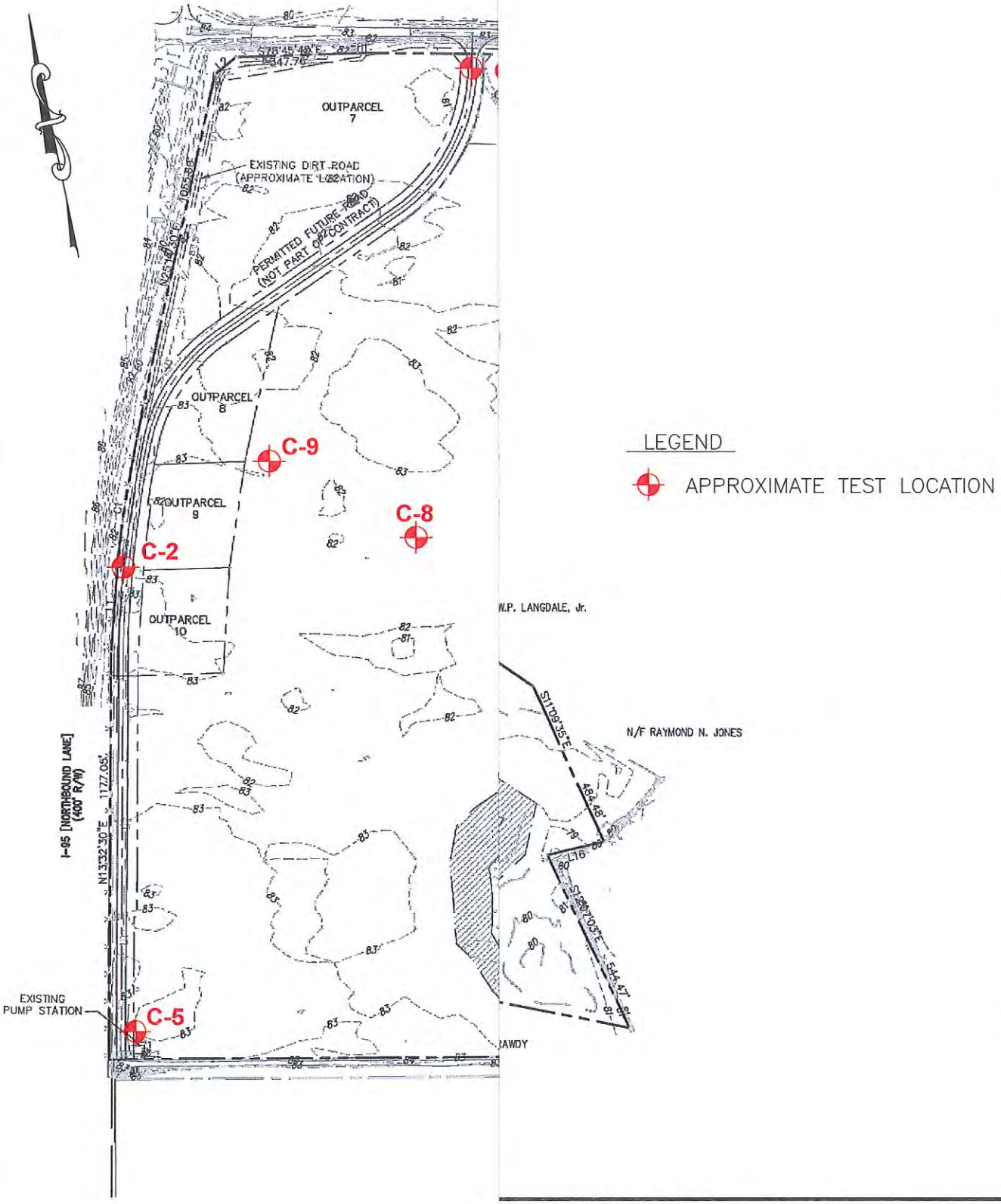
CPT Sounding Logs

Hand-Auger Boring Logs

Lab Data Summary

Field Testing Procedures

Laboratory Testing Procedures



TEST LOCATION PLAN
LLETON COUNTY COMMERCE CENTER
WALTERBORO, SOUTH CAROLINA

HOWN	DRAWN BY: LAJ	APPROVED BY:
13-429	DATE: 9-11-2013	FIGURE NO. 1

Note: Site plan created by U

S&ME

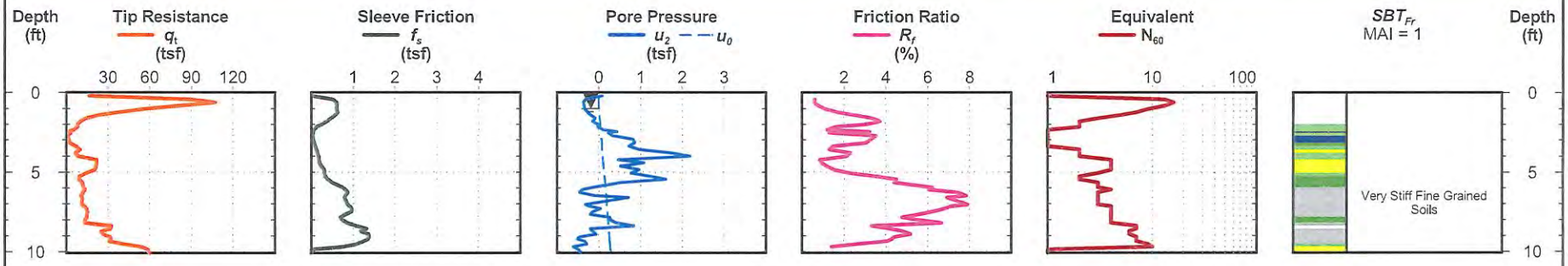
Colleton County Commerce Center
Walterboro, South Carolina
S&ME Project No: 1131-13-429

Cone Penetration Test

C-1

Date: Aug. 16, 2013
Estimated Water Depth: 1 ft
Rig/Operator: A. Fiex

Total Depth: 10.1 ft
Termination Criteria: Target Depth
Cone Size: 1.75



CPT REPORT - STANDARD - SBT FR 1131-13-429CPT.GPJ S&ME.GDT 9/11/13

Electronic Filename: H16G1301C.ECP

C-1

S&ME

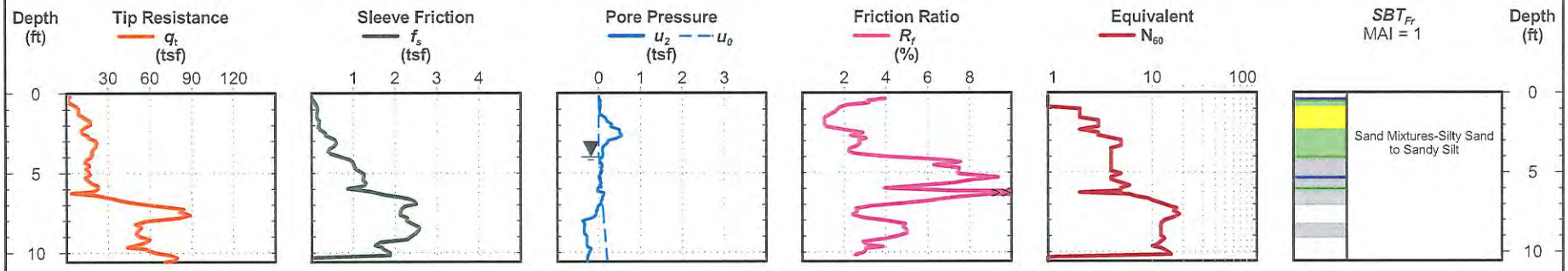
Colleton County Commerce Center
Walterboro, South Carolina
S&ME Project No: 1131-13-429

Cone Penetration Test

C-2

Date: Aug. 16, 2013
Estimated Water Depth: 4 ft
Rig/Operator: A. Fiex

Total Depth: 10.6 ft
Termination Criteria: Target Depth
Cone Size: 1.75



CPT REPORT - STANDARD - SBT FR 1131-13-429CPT.GPJ S&ME.GDT 9/11/13

Electronic Filename: H16G1306C.ECP

C-2

S&ME

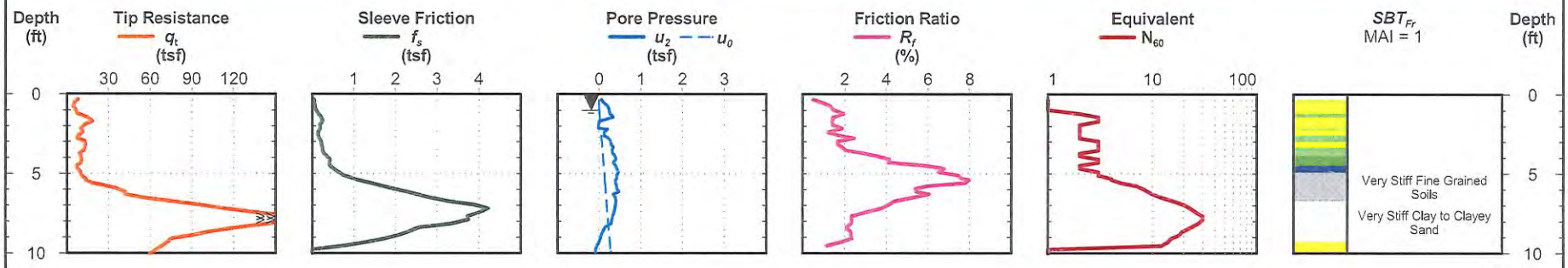
Colleton County Commerce Center
Walterboro, South Carolina
S&ME Project No: 1131-13-429

Cone Penetration Test

C-3

Date: Aug. 16, 2013
Estimated Water Depth: 1 ft
Rig/Operator: A. Fiex

Total Depth: 10.0 ft
Termination Criteria: Target Depth
Cone Size: 1.75



CPT REPORT - STANDARD - SBT FR 1131-13-429CPT.GPJ S&ME.GDT 9/11/13

Electronic Filename: H16G1308C.ECP

C-3

S&ME

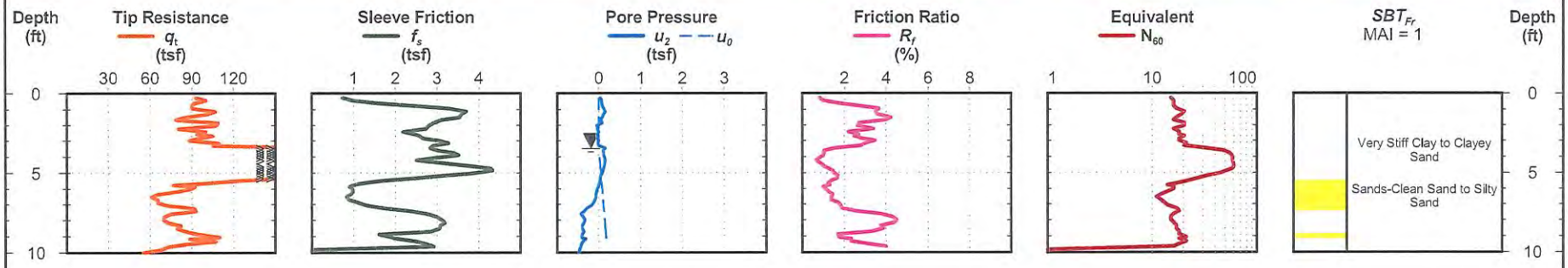
Colleton County Commerce Center
Walterboro, South Carolina
S&ME Project No: 1131-13-429

Cone Penetration Test

C-4

Date: Aug. 16, 2013
Estimated Water Depth: 3.5 ft
Rig/Operator: A. Fiex

Total Depth: 10.0 ft
Termination Criteria: Target Depth
Cone Size: 1.75



Electronic Filename: H16G1309C.ECP

C-4

CPT REPORT - STANDARD - SBT FR 1131-13-429CPT.GPJ S&ME.GDT 9/11/13

S&ME

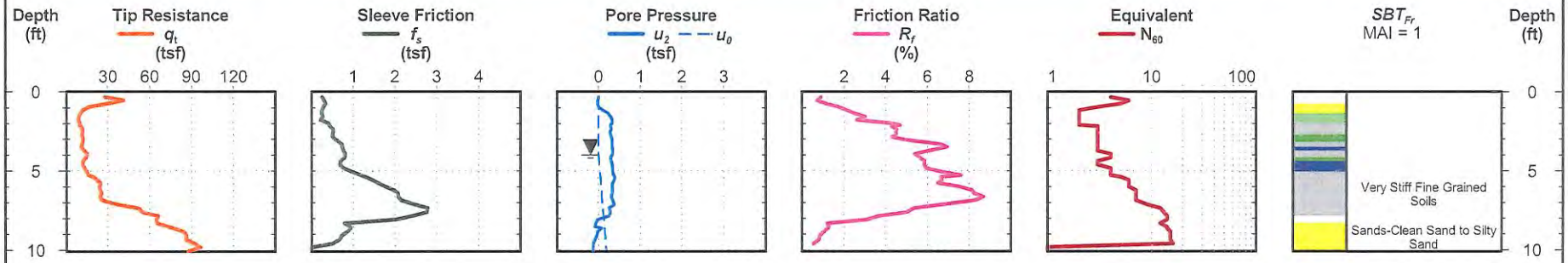
Colleton County Commerce Center
Walterboro, South Carolina
S&ME Project No: 1131-13-429

Cone Penetration Test

C-5

Date: Aug. 16, 2013
Estimated Water Depth: 4 ft
Rig/Operator: A. Fiex

Total Depth: 10.1 ft
Termination Criteria: Target Depth
Cone Size: 1.75



CPT REPORT - STANDARD - SBT FR 1131-13-429CPT.GPJ S&ME.GDT 9/11/13

Electronic Filename: H16G1307C.ECP

C-5

S&ME

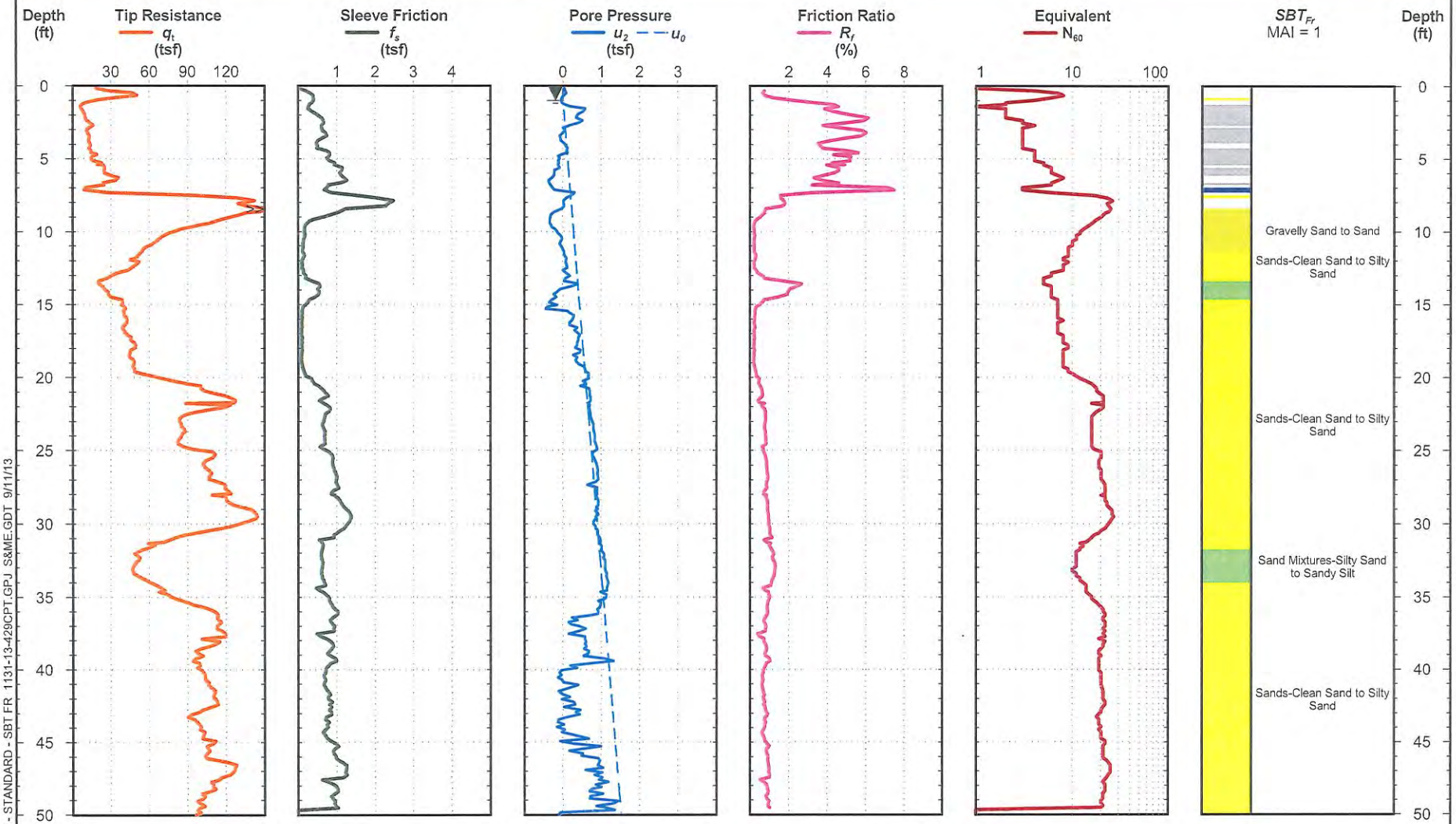
Colleton County Commerce Center
Walterboro, South Carolina
S&ME Project No: 1131-13-429

Cone Penetration Test

C-6

Date: Aug. 16, 2013
Estimated Water Depth: 1 ft
Rig/Operator: A. Fiex

Total Depth: 50.0 ft
Termination Criteria: Target Depth
Cone Size: 1.75



C-6

CPT REPORT - STANDARD - SBT FR 1131-13-429CPT.GPJ S&ME.GDT 9/11/13

Electronic Filename: H16G1303C.ECP

S&ME

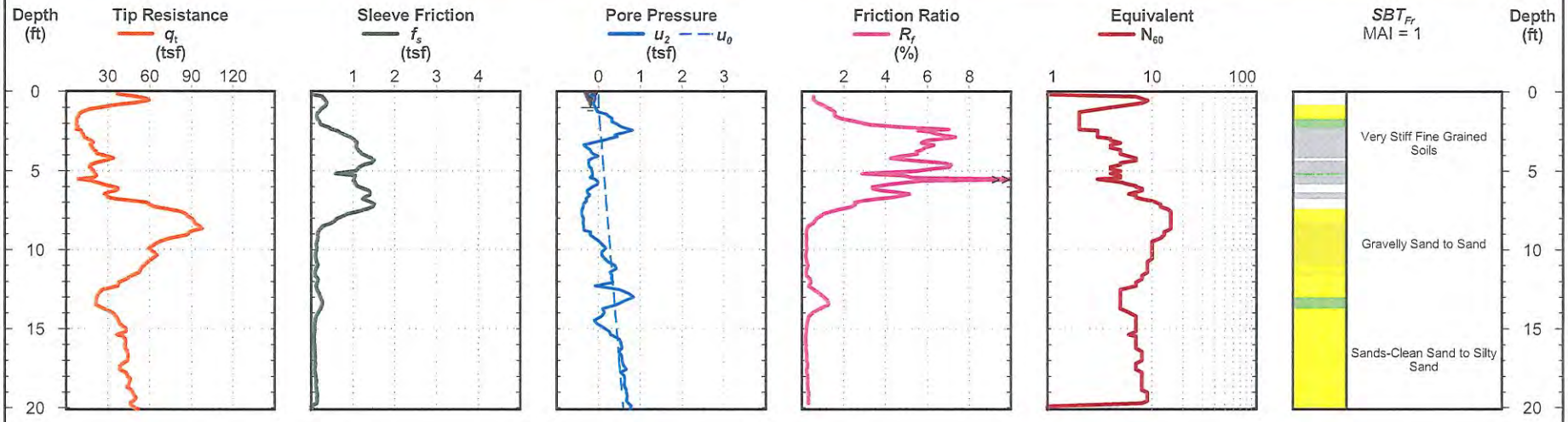
Colleton County Commerce Center
Walterboro, South Carolina
S&ME Project No: 1131-13-429

Cone Penetration Test

C-7

Date: Aug. 16, 2013
Estimated Water Depth: 1 ft
Rig/Operator: A. Fiex

Total Depth: 20.1 ft
Termination Criteria: Target Depth
Cone Size: 1.75



CPT REPORT - STANDARD - SBT FR 1131-13-429CPT.GPJ S&ME.GDT 9/11/13

Electronic Filename: H16G1302C.ECP

C-7

S&ME

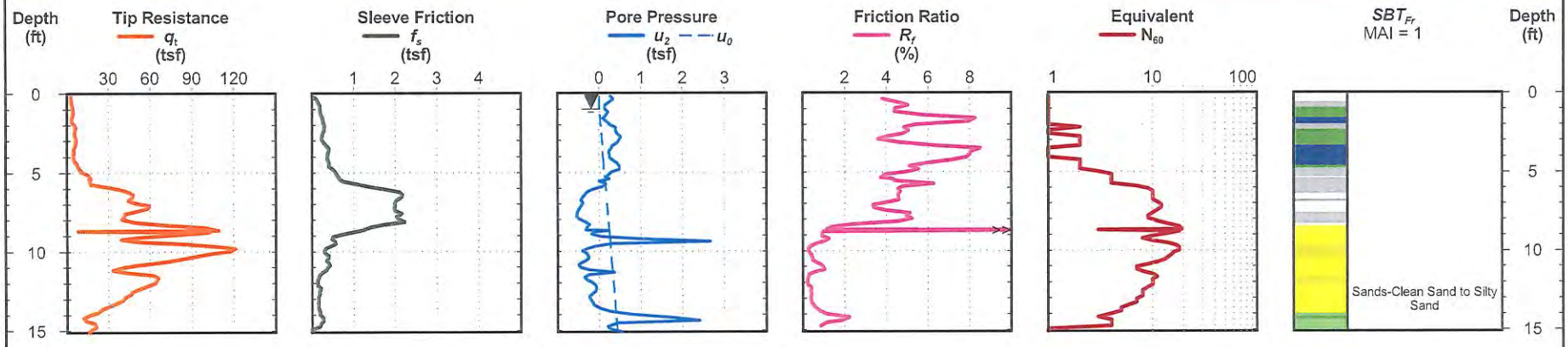
Colleton County Commerce Center
Walterboro, South Carolina
S&ME Project No: 1131-13-429

Cone Penetration Test

C-8

Date: Aug. 16, 2013
Estimated Water Depth: 1 ft
Rig/Operator: A. Fiex

Total Depth: 15.1 ft
Termination Criteria: Target Depth
Cone Size: 1.75



CPT REPORT - STANDARD - SBT FR 1131-13-429CPT.GPJ S&ME.GDT 9/11/13

Electronic Filename: H16G1304C.ECP

C-8

S&ME

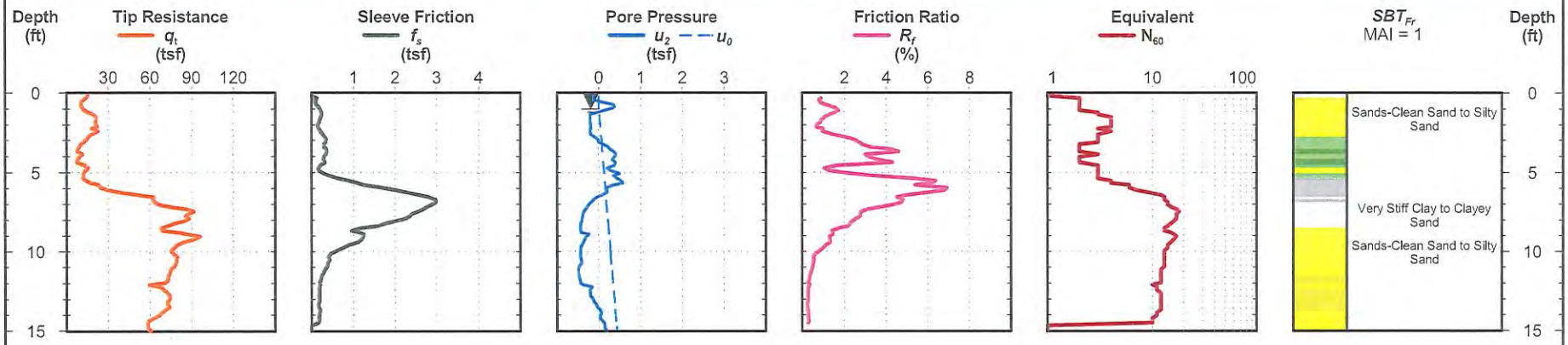
Colleton County Commerce Center
Walterboro, South Carolina
S&ME Project No: 1131-13-429

Cone Penetration Test

C-9

Date: Aug. 16, 2013
Estimated Water Depth: 1 ft
Rig/Operator: A. Fiex

Total Depth: 15.0 ft
Termination Criteria: Target Depth
Cone Size: 1.75



CPT REPORT - STANDARD - SBT FR 1131-13-429CPT.GPJ S&ME.GDT 9/11/13

Electronic Filename: H16G1305C.ECP

C-9

PROJECT:	Colleton County Commerce Center Walterboro, South Carolina 1131-13-429	**HAND AUGER BORING LOG: C-1**
DATE STARTED: 8/14/13	DATE FINISHED: 8/14/13	NOTES:
SAMPLING METHOD: Hand-Auger	PERFORMED BY: David Schoen	
WATER LEVEL:	**Groundwater not encountered at time of boring**	

Depth (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION (feet)	WATER LEVEL
		ORGANIC LADEN TOPSOIL = 9 INCHES		
1		**SANDY CLAY (CL)** gray to brown, moist		
		- - - Reddish brown to gray		
2				
		- - - Brownish gray		
3				
4		Boring terminated at 4 ft		

S&ME

PROJECT:	Colleton County Commerce Center Walterboro, South Carolina 1131-13-429	**HAND AUGER BORING LOG: C-2**
DATE STARTED: **8/14/13**	DATE FINISHED: **8/14/13**	NOTES:
SAMPLING METHOD: **Hand-Auger**	PERFORMED BY: **David Schoen**	
WATER LEVEL:	**Groundwater encountered at 2.5 ft at time of boring**	

Depth (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION (feet)	WATER LEVEL
		FILL: CLAYEY SAND (SC) dark reddish brown, fine, moist		
		- - - Brown		
1		**CLAYEY SAND (SC)** brown to gray		
2		- - - Reddish brown to gray, wet		▽
3				
4		Boring terminated at 4 ft		

S&ME

PROJECT:	Colleton County Commerce Center Walterboro, South Carolina 1131-13-429	**HAND AUGER BORING LOG: C-3**
DATE STARTED: 8/14/13	DATE FINISHED: 8/14/13	NOTES:
SAMPLING METHOD: Hand-Auger	PERFORMED BY: David Schoen	
WATER LEVEL:	**Groundwater not encountered at time of boring**	

Depth (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION (feet)	WATER LEVEL
		FILL: CLAYEY SAND (SC) with gravel, dark brown to dark gray, moist		
1		**POSSIBLE FILL: SANDY CLAY (CL)** brown to gray, moist		
2		**CLAYEY SAND (SC)** gray, moist, fine		
3		**SANDY CLAY (CL)** olive brown to gray, some mottling, moist		
4		Boring terminated at 4 ft		

S&ME

PROJECT:	Colleton County Commerce Center Walterboro, South Carolina 1131-13-429	**HAND AUGER BORING LOG: C-4**
DATE STARTED: 8/14/13	DATE FINISHED: 8/14/13	NOTES:
SAMPLING METHOD: Hand-Auger	PERFORMED BY: David Schoen	
WATER LEVEL:	**Groundwater not encountered at time of boring**	

Depth (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION (feet)	WATER LEVEL
		CRUSHED STONE = 7 INCHES		
		FILL: CLAYEY SAND (SC) red, fine, moist		
1		- - - Brown		
2		- - - Very dark gray to brown		
3		**POSSIBLE FILL : SANDY CLAY (CL)** reddish brown to olive brown, some mottling, moist		
		SAND (SP) light gray, fine, moist		
4		Boring terminated at 4 ft		

S&ME

PROJECT:	Colleton County Commerce Center Walterboro, South Carolina 1131-13-429	HAND AUGER BORING LOG: C-5
DATE STARTED: 8/14/13	DATE FINISHED: 8/14/13	NOTES:
SAMPLING METHOD: Hand-Auger	PERFORMED BY: David Schoen	
WATER LEVEL: Groundwater not encountered at time of boring		

Depth (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION (feet)	WATER LEVEL
		FILL: CLAYEY SAND (SC) dark brown to light gray, fine, moist		
1		**POSSIBLE FILL : SANDY CLAY (CL)** dark gray to reddish brown, moist		
2		**SLIGHTLY CLAYEY SAND (SP-SC)** reddish brown, medium, moist - - - Light gray		
3		**SANDY CLAY (CL)** dark gray, moist		
4		Boring terminated at 4 ft		

PROJECT:	Colleton County Commerce Center Walterboro, South Carolina 1131-13-429	HAND AUGER BORING LOG: C-6
DATE STARTED: 8/19/13	DATE FINISHED: 8/19/13	NOTES:
SAMPLING METHOD: Hand-Auger	PERFORMED BY: David Schoen	
WATER LEVEL: Groundwater at ground surface at time of boring		

Depth (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION (feet)	WATER LEVEL
		ORGANIC LADEN TOPSOIL = 7 INCHES		
1		CLAYEY SAND (SC) light brown to light gray, fine, wet		
2		SANDY CLAY (CL) gray to light reddish brown, wet		
3				
4		Boring terminated at 4 ft		

S&ME

PROJECT:	Colleton County Commerce Center Walterboro, South Carolina 1131-13-429	**HAND AUGER BORING LOG: C-7**
DATE STARTED: **8/19/13**	DATE FINISHED: **8/19/13**	NOTES:
SAMPLING METHOD: **Hand-Auger**	PERFORMED BY: **David Schoen**	
WATER LEVEL:	**Groundwater at ground surface at time of boring**	

Depth (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION (feet)	WATER LEVEL
		ORGANIC LADEN TOPSOIL = 4 INCHES		
		SAND (SP) light grayish brown, fine, wet		
1		**CLAYEY SAND (SC)** light gray to light brown, fine, wet		
2		**SANDY CLAY (CL)** light gray to light reddish brown, wet		
3				
4		Boring terminated at 4 ft		

S&ME

PROJECT:	Colleton County Commerce Center Walterboro, South Carolina 1131-13-429	**HAND AUGER BORING LOG: C-8**
DATE STARTED: **8/19/13**	DATE FINISHED: **8/19/13**	NOTES:
SAMPLING METHOD: **Hand-Auger**	PERFORMED BY: **David Schoen**	
WATER LEVEL:	**Groundwater at ground surface at time of boring**	

Depth (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION (feet)	WATER LEVEL
		ORGANIC LADEN TOPSOIL = 10 INCHES		
1		**CLAYEY SAND (SC)** grayish brown, fine, wet		
2		**SANDY CLAY (CL)** reddish brown to brown, mottled, wet		
3		Boring terminated at 3 ft due to auger refusal		

PROJECT:	Colleton County Commerce Center Walterboro, South Carolina 1131-13-429	**HAND AUGER BORING LOG: C-9**
DATE STARTED: 8/19/13	DATE FINISHED: 8/19/13	NOTES:
SAMPLING METHOD: Hand-Auger	PERFORMED BY: David Schoen	
WATER LEVEL:	**Groundwater at ground surface at time of boring**	

Depth (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION (feet)	WATER LEVEL
		ORGANIC LADEN TOPSOIL = 8 INCHES		
1		**CLAYEY SAND (SC)** light brown to light gray, fine, wet		
2				
3		**SANDY CLAY (CL)** brown to gray, wet		
4		Boring terminated at 4 ft		

Laboratory Data Summary Sheet
Colleton County Commerce Center
S&ME Project No. 1131-13-429

Sample ID	Depth (ft)	USCS Symbol	Natural Moisture (%)	% Finer #200 Sieve	Atterberg Limits			Modifield Proctor		Corrected CBR (%)
					LL	PL	PI	OMC (%)	Max $\gamma_{d\ (pcf)}$	
Push Tube @ C-9	7 - 8	SC	17.2	24.3	25	17	8	-	-	-
Bulk #1 at C-7	1 - 2	SM	13.7	21.3	NP	NP	NP	8.4	122.9	12
Bulk #2 at C-8	1 - 2	SC	27.1	34.3	22	15	7	-	-	-

Form No: TR-D422-WH-1Ga
Revision No. 0
Revision Date: 07/14/08

Sieve Analysis of Soils

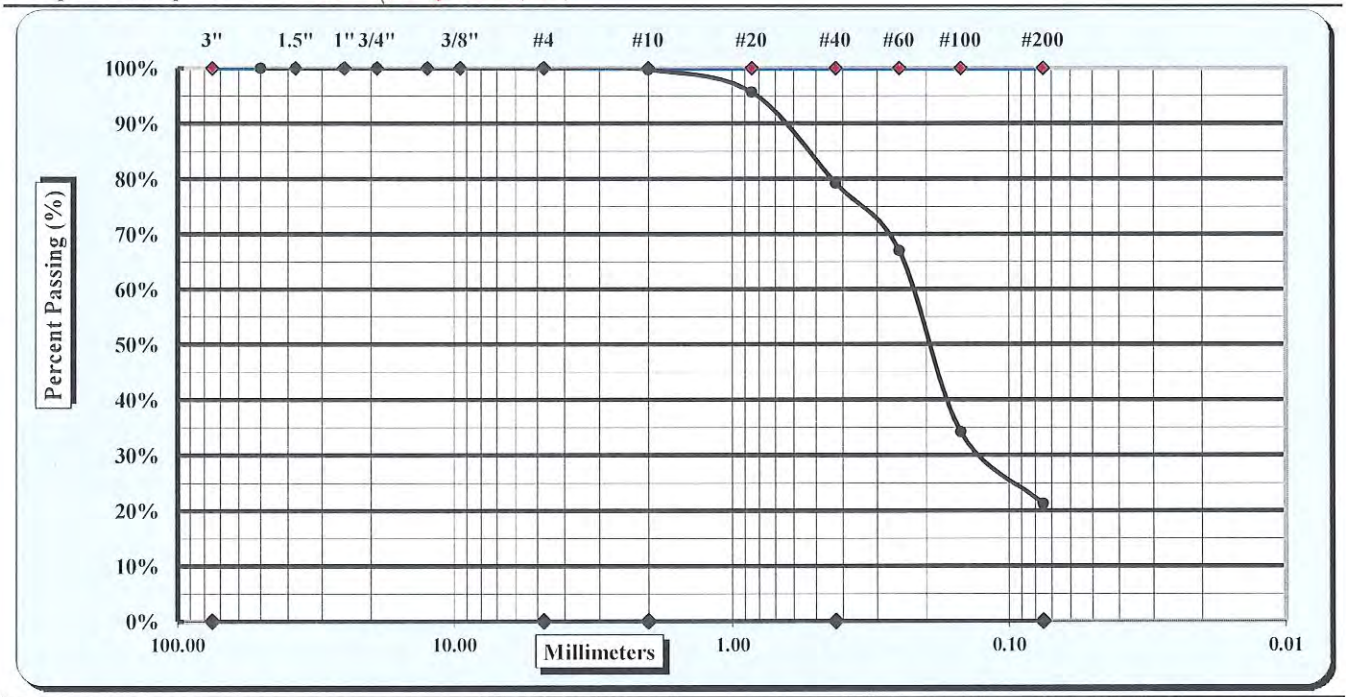
ASTM D 422

Quality Assurance

S&ME, Inc. - 620 Wando Park Blvd., Mt. Pleasant, SC 29464

Project #:	1131-13-429	Report Date:	9-3-13
Project Name:	Colleton County Commerce Center	Test Date(s):	8-27-13
Client Name:	URS		
Client Address:	101 Research Drive		
Sample Id.	BS-1@ C-7	Type:	Sample Date:
Location:		Sample:	Depth: 7.0-8.0 ft

Sample Description: brown, silty sand (SM)



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size	#4	Coarse Sand	0.3%	Fine Sand	57.9%
Gravel	0.0%	Medium Sand	20.5%	Silt & Clay	21.3%
Liquid Limit	NP	Plastic Limit	NP	Plastic Index	NP
Specific Gravity				Moisture Content	13.7%

Coarse Sand	0.3%	Medium Sand	20.5%	Fine Sand	57.9%

Description of Sand & Gravel Particles: Rounded ☐ Angular ☐
Hard & Durable ☐ Soft ☐ Weathered & Friable ☐

Notes / Deviations / References:

Telford Wood		Construction Services Manager	9/3/2013
Technical Responsibility	*Signature*	*Position*	*Date*

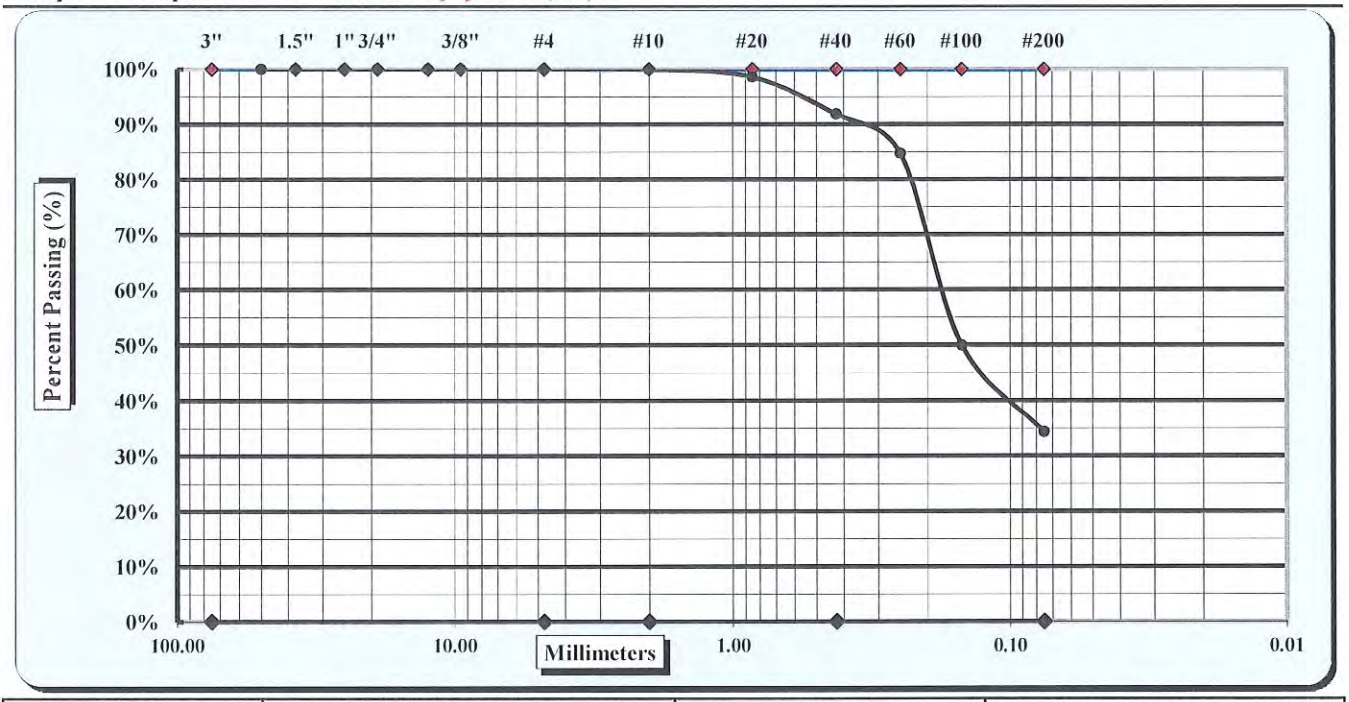
Sieve Analysis of Soils

ASTM D 422

Quality Assurance

S&ME, Inc. - 620 Wando Park Blvd., Mt. Pleasant, SC 29464

Project #:	1131-13-429	Report Date:	9-3-13
Project Name:	Colleton County Commerce Center	Test Date(s):	8-27-13
Client Name:	URS		
Client Address:	101 Research Drive		
Sample Id.	BS-2 @ C-8	Type:	Sample Date:
Location:		Sample:	Depth: 7.0-8.0 ft
Sample Description:	Brown, clayey sand (SC)		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size	#10	Coarse Sand	0.1%	Fine Sand	57.5%
Gravel	0.0%	Medium Sand	8.1%	Silt & Clay	34.3%
Liquid Limit	22	Plastic Limit	15	Plastic Index	7
Specific Gravity				Moisture Content	27.1%
Coarse Sand	0.1%	Medium Sand	8.1%	Fine Sand	57.5%

Description of Sand & Gravel Particles: Rounded ☐ Angular ☐

Hard & Durable ☐ Soft ☐ Weathered & Friable ☐

Notes / Deviations / References:

Telford Wood		Construction Services Manager	9/3/2013
Technical Responsibility	*Signature*	*Position*	*Date*

Sieve Analysis of Soils

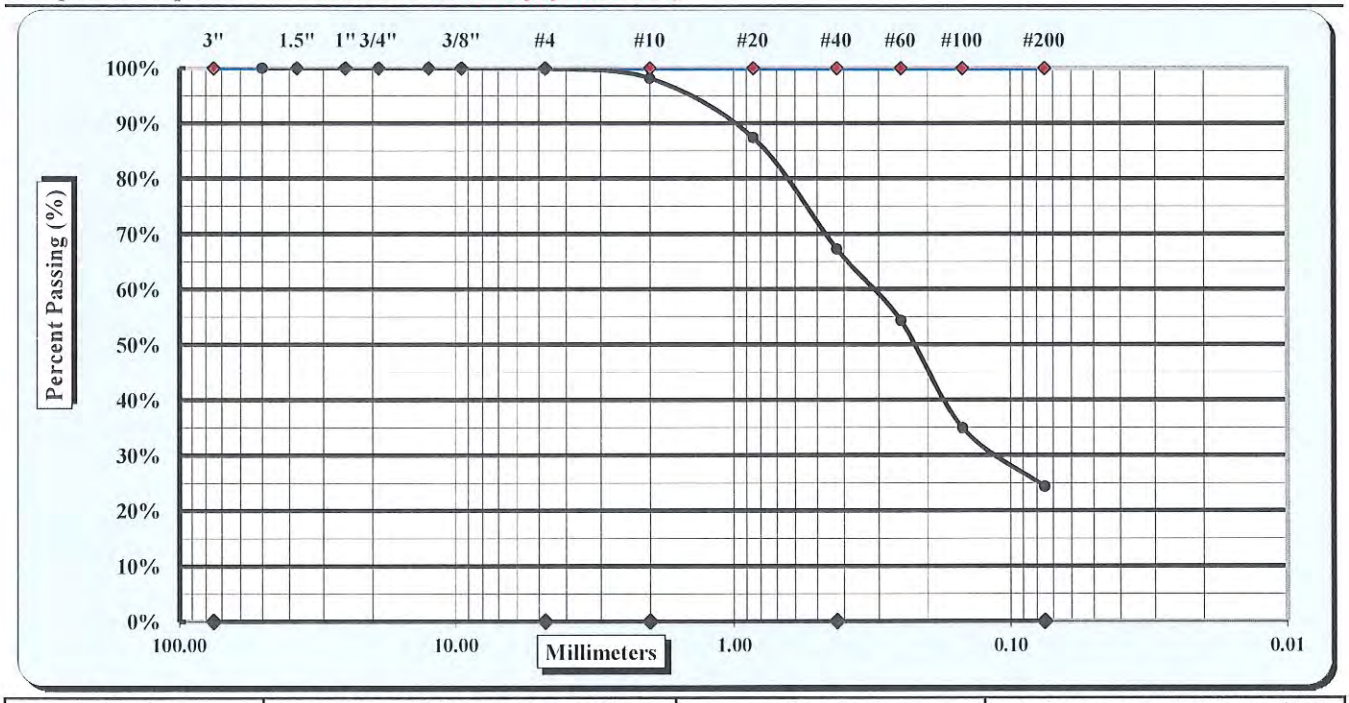
ASTM D 422

Quality Assurance

S&ME, Inc. - 620 Wando Park Blvd., Mt. Pleasant, SC 29464

Project #:	1131-13-403	Report Date:	9-3-13
Project Name:	Colleton County Commerce Center	Test Date(s):	8-27-13
Client Name:	URS		
Client Address:	101 Research Drive		
Sample Id. C-9	Type:	Sample Date:	
Location:	Sample:	Depth:	7.0-8.0 ft

Sample Description: reddish brown, clayey sand (SC)



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size	#4	Coarse Sand	1.7%	Fine Sand	43.0%
Gravel	0.1%	Medium Sand	30.9%	Silt & Clay	24.3%
Liquid Limit	25	Plastic Limit	17	Plastic Index	8
Specific Gravity				Moisture Content	17.2%
Coarse Sand	1.7%	Medium Sand	30.9%	Fine Sand	43.0%

Description of Sand & Gravel Particles: Rounded ☐ Angular ☐

Hard & Durable ☐ Soft ☐ Weathered & Friable ☐

Notes / Deviations / References:

Telford Wood		Construction Services Manager	9/3/2013
Technical Responsibility	*Signature*	*Position*	*Date*

Form No. TR-D698-2
Revision No. : 0
Revision Date: 11/21/07

Moisture - Density Report

S&ME

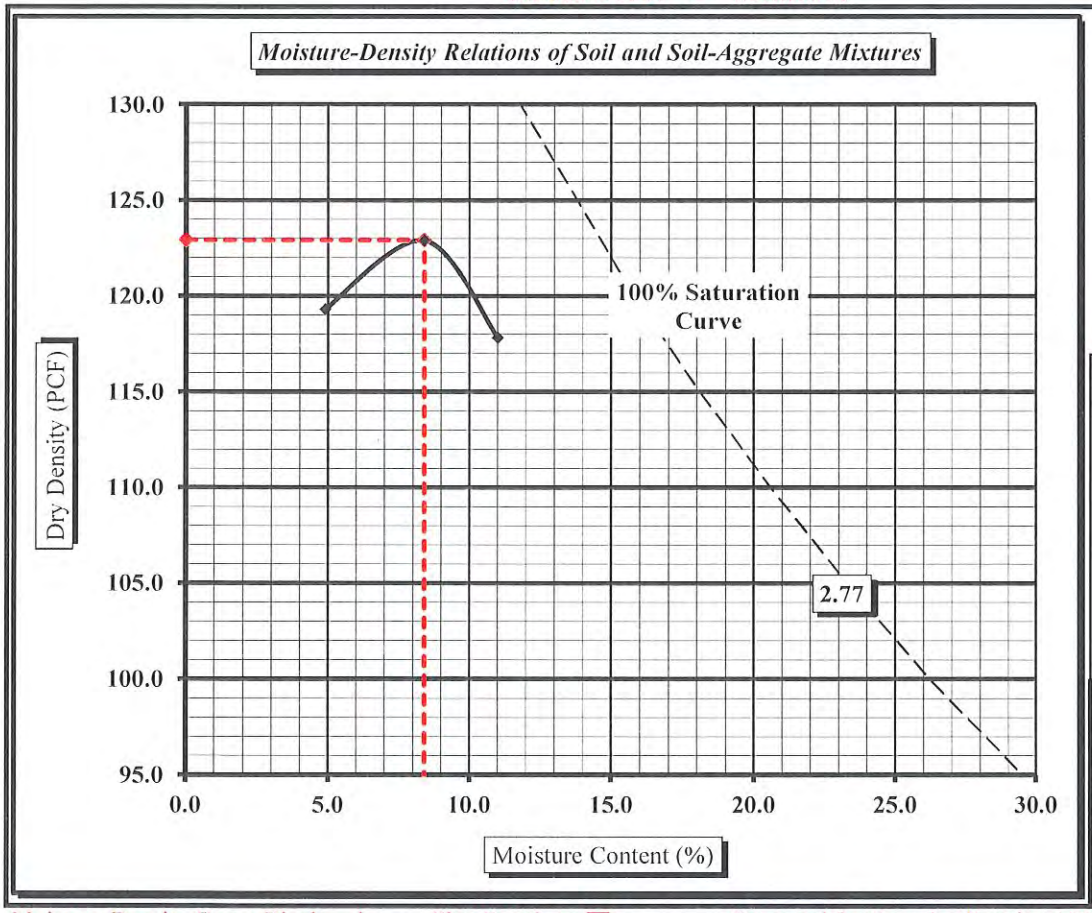
Quality Assurance

S&ME, Inc. Charleston Branch, 620 Wando Park Blvd. Mt. Pleasant, SC 29464

S&ME Project #:	1131-13-429	Report Date:	8-27-13
Project Name:	Colleton County Commerce Center	Test Date(s):	8-27-13
Client Name:	USR		
Client Address:	101 Research Drive; Columbia, SC 29203-9389		
Boring #:	BS-1 @ C-7 Sample #: #1	Sample Date:	8/19/2013
Location:	Offset:	Depth:	1-3.0 ft
Sample Description:	brown, silty sand (SM)		

Maximum Dry Density 122.9 **PCF.** **Optimum Moisture Content** 8.4%

ASTM D1557 -- Method A



Soil Properties

Natural Moisture Content
Specific Gravity of Soil
Liquid Limit
Plastic Limit
Plastic Index

% Passing

3/4"
#4
#10
#20
#40
#60
#100
#200

Oversize Fraction

Bulk Gravity
% Moisture
% Oversize
MDD
Opt. MC

Moisture-Density Curve Displayed: Fine Fraction ☒ Corrected for Oversize Fraction (ASTM D 4718) ☐

Sieve Size used to separate the Oversize Fraction: #4 Sieve ☒ 3/8 inch Sieve ☐ 3/4 inch Sieve ☐

Mechanical Rammer ☒ Manual Rammer ☐ Moist Preparation ☐ Dry Preparation ☒

References / Comments / Deviations:

ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass
ASTM D 1557: Laboratory Compaction Characteristics of Soil Using Modified Effort

Telford Wood		Construction Services Manager	7/20/2013
Technical Responsibility	*Signature*	*Position*	*Date*

Form No. TR-D1833-T193-3
Revision No. 0
Revision Date: 2/6/08

CBR (California Bearing Ratio) of Laboratory Compacted Soil

S&ME

Quality Assurance

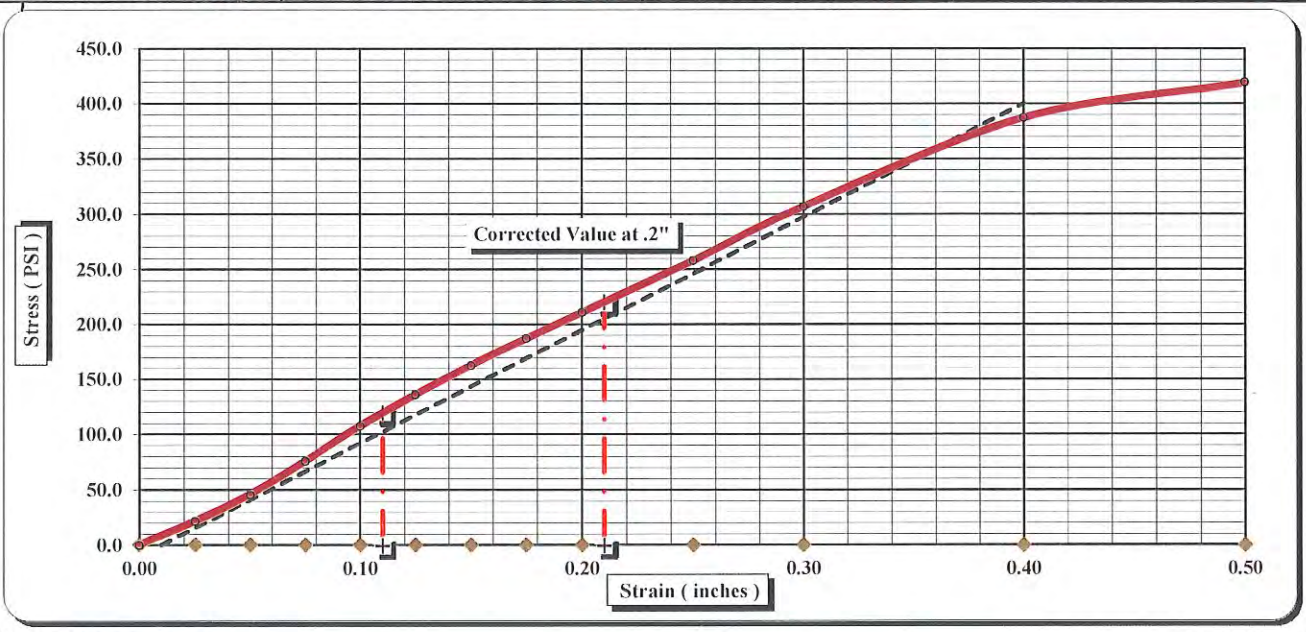
S&ME, Inc.620 Wando Park Blvd., Mt. Pleasant, SC 29464

Project #:	**1131-13-429**	Report Date:	9-3-13
Project Name:	Colleton County Commerce Center	Test Date(s)	8-29-13
Client Name:	URS		
Client Address:	101 Research Drive; Columbia, SC 29203-9389		
Boring #:	BS-1	Sample #: 1	Sample Date:
Location:		Offset:	Depth: 1.0-3.0 ft
Sample Description:	(SM) fine silty sand light grayish brown		

ASTM D1557 *Method A* Maximum Dry Density: **122.9 PCF** Optimum Moisture Content: **8.4%**

Line 19: Use an alternate discription here if applicable — % Retained on the 3/4" sieve: **0.0%**

Uncorrected CBR Values		Corrected CBR Values	
CBR at 0.1 in. 10.7	CBR at 0.2 in. 14.0	CBR at 0.1 in. 12.0	CBR at 0.2 in. 14.7



CBR Sample Preparation:

Grading was in accordance with the above method and compacted using the 6" diameter CBR mold.

Before Soaking		*After Soaking*	
Compactive Effort (Blows per Layer)	0	Final Dry Density (PCF)	111.8
Initial Dry Density (PCF)	116.1	Average Final Moisture Content	11.3%
Moisture Content of the Compacted Specimen	8.4%	Moisture Content (top 1" after soaking)	9.5%
Percent Compaction	94.5%	Percent Swell	1.2%

Soak Time: 96hr Surcharge Weight 10.0 Surcharge Wt. per sq. Ft. 51.3

Liquid Limit NP Plastic Index NP Apparent Relative Density

Notes/Deviations/References: Liquid Limit: ASTM D 4318, Specific Gravity: ASTM D 854, Classification: ASTM D 2487

Telford Wood		Construction Services Manager	7/30/2013
Technical Responsibility	*Signature*	*Position*	*Date*

FIELD TESTING PROCEDURES

Cone Penetrometer Test (CPT) Sounding

The cone penetrometer test soundings (ASTM D 5778) were performed by hydraulically pushing an electronically instrumented cone penetrometer through the soil at a constant rate. As the cone penetrometer tip was advanced through the soil, nearly continuous readings of point stress, sleeve friction and pore water pressure were recorded and stored in the on-site computers. Using theoretical and empirical relationships, CPT data can be used to determine soil stratigraphy and estimate soil properties and parameters such as effective stress, friction angle, Young's Modulus and undrained shear strength.

The consistency and relative density designations, which are based on the cone tip resistance, q_t for sands and cohesive soils (silts and clays) are as follows:

SANDS		SILTS AND CLAYS	
Cone Tip Resistance, q_t (tsf)	**Relative Density**	**Cone Tip Resistance, q_t (tsf)**	**Consistency**
<20	Very Loose	<5	Very Soft
20 – 40	Loose	5 – 10	Soft
40 – 120	Medium Dense	10 – 15	Firm
		15 – 30	Stiff
120 – 200	Dense	30 –60	Very Stiff
>200	Very Dense	>60	Hard

CPT Correlations

References are in parenthesis next to the appropriate equation.

General

p_a = atmospheric pressure (for unit normalization)
q_t = corrected cone tip resistance (tsf)
f_s = friction sleeve resistance (tsf)
$R_f = 100\% * (f_s/q_t)$
u_2 = pore pressure behind cone tip (tsf)
u_0 = hydrostatic pressure
$B_q = (u_2-u_0)/(q_t-\sigma_{v0})$
$Q_t = (q_t-\sigma_{v0})/ \sigma'_{v0}$
$F_r = 100\% * f_s/(q_t- \sigma_{v0})$
$I_c = ((3.47-\log Q_t)^2+(\log F_r+1.22)^2)^{0.5}$

N-Value
$N_{60} = (q_t/pa)/[8.5(1-I_c/4.6)]$ (6)

(6) Jefferies, M.G. and Davies, M.P., (1993), "Use of CPTu to estimate equivalent SPT N60", ASTM Geotechnical Testing Journal, Vol. 16, No. 4

CPT Soil Classification Legend

Zone		Q_t/N	Description
1		2	Sensitive, Fine Grained
2		1	Organic Soils-Peats
3		1.5	Clays-Clay to Silty Clay
4		2	Silt Mixtures-Clayey Silt to Silty Clay
5		3	Sand Mixtures-Silty Sand to Sandy Silt
6		4.5	Sands-Clean Sand to Silty Sand
7		6	Gravelly Sand to Sand
8		1	Very Stiff Clay to Clayey Sand*
9		2	Very Stiff, Fine Grained*

(*) Heavily Overconsolidated or Cemented

Robertson's Soil Behavior Type (SBT), 1990			
Group #	**Description**	**Ic**	
		Min	**Max**
1	Sensitive, fine grained	N/A	
2	Organic soils - peats	3.60	N/A
3	Clays - silty clay to clay	2.95	3.60
4	Silt mixtures - clayey silt to silty clay	2.60	2.95
5	Sand mixtures - silty sand to sandy silt	2.05	2.60
6	Sands - clean sand to silty sand	1.31	2.05
7	Gravelly sand to dense sand	N/A	1.31
8	Very stiff sand to clayey sand (High OCR or cemented)	N/A	
9	Very stiff, fine grained (High OCR or cemented)	N/A	

Soil behavior type is based on empirical data and may not be representative of soil classification based on plasticity and grain size distribution.

Relative Density and Consistency Table			
SANDS		SILTS and CLAYS	
Cone Tip Stress, qt (tsf)	Relative Density	Cone Tip Stress, qt (tsf)	Consistency
Less than 20	Very Loose	Less than 5	Very Soft
20 - 40	Loose	5 - 15	Soft to Firm
40 - 120	Medium Dense	15 - 30	Stiff
120 - 200	Dense	30 - 60	Very Stiff
Greater than 200	Very Dense	Greater than 60	Hard

Hand-auger Borings

Hand-auger borings are performed by manually turning a steel auger into the ground. The soils encountered are visually classified in the field using the Unified Soil Classification System (USCS). If encountered, subsurface water level depths are measured from the existing ground surface at the time of boring. Upon completion, the bore hole was immediately backfilled with the cuttings.

LABORATORY TESTING PROCEDURES

Atterberg Limits Test (ASTM D-4318)

Atterberg Limits tests were performed to determine the soil plasticity characteristics. The soil plasticity index (PI) is representative of this characteristic and is bracketed by the liquid limit (LL) and the plastic limit (PL). The liquid limit is the moisture content at which the soil will flow as a heavy viscous fluid. The plastic limit is the moisture content at which the soil begins to lose its plasticity. The difference between the liquid limit and plastic limit is the plasticity index.

Grain Size Tests (ASTM D 1140 and ASTM D 422)

Grain size tests were performed to determine the soil particle size distribution. The amount of material finer than the #200 sieve was determined by washing the sample over that particular size sieve. The grain size distribution of the soil retained on the #200 sieve was then determined by passing the retained portion through a standard set of nested sieves.

Natural Moisture Content Test (ASTM D 2216)

Moisture content tests were conducted to determine the ratio, expressed as a percentage, of the weight of water in a given amount of soil to the weight of the solid particles.

Moisture-Density Relationship (Modified Proctor) (ASTM D 1557)

Bulk samples of near surface soils were tested to determine moisture-density characteristics by the "modified" method using a 10-lb. hammer and 18 inch drop. The tests determine maximum dry density and optimum moisture content. Test results are graphically presented in the form of dry density versus moisture content on the Compaction Test sheets included in the Appendix.

Laboratory California Bearing Ratio (CBR) Tests (ASTM D 1883)

The California Bearing Ratio, usually abbreviated as CBR, is a punching shear test. The CBR value is a semi-empirical index of the soil strength and deflection characteristics and has been correlated with pavement performance to establish design curves for pavement thickness. The test was performed on 6-inch diameter, 5-inch thick discs of compacted soil, confined in a steel cylinder. The specimens were then soaked for 96 hours prior to testing. A piston approximately 2-inches in diameter was then forced into the soils at a standard rate to determine the resistance to penetration. The CBR is the ratio, expressed as a percentage, of the actual load required to produce a 0.1 inch deflection to the load required for the same deflection in a standard crushed stone sample. The results of the CBR tests are given on the CBR Test sheets included in the Appendix.

SECTION 00 4321 - ON-SITE UNIT PRICES FORM - SUPPLEMENT A - R2

PARTICULARS

The following is the list of Unit Prices referenced in the bid submitted by:

(Bidder) _____

TO (Owner) _____

dated _____ and which is an integral part of the Bid Form.

The following are Unit Prices for specific portions of the Work as listed, and are applicable to authorized variations from the Contract Documents.

These Unit Prices will be used to adjust On-Site portions of the Work only. See Supplement B for Unit Prices associated with Off-Site portions of the Work.

UNIT PRICES:

The following Unit Prices shall be utilized as noted in the Bid Documents to adjust the Contract Sum for the actual quantities of work performed, above or below the Bid quantities listed herein below by the Contractor. (See Specification Section 01 2100 and Section 01 2200):

UNIT PRICE LIST

Item No.	Description	Estimated Quantity	Unit of Measure	Unit Price	Total
1	Clearing & Grubbing		AC	$	$
2	Unsuitable Soil Removal & Disposal		CY	$	$
3	Import, Placement & Compaction of Structural Fill		CY	$	$
4	Graded Aggregate Base Course (6" Unif.)		SY	$	$
5	Prime Coat		GAL	$	$
6	Hot Mix Asphalt Surface Course - Type B		TON	$	$
7	Portland Cement Concrete Paving (4" Unif)		SY	$	$
8	Portland Cement Concrete Sidewalk (5-ft Wide)		LF	$	$
9	24" White Solid Lines (Stop Bar) - Thermoplastic 125 Mil.		LF	$	$
10	4" Yellow Solid Double Line (Entrance Centerline) - Dry Paint		LF	$	$
11	4" White Solid Single Line (Parking Stall Stripe)- Dry Paint		LF	$	$
12	4" Blue Solid Single Line (Handicap Parking Stalls) - Dry Paint		LF	$	$
13	Flat Sheet, Type III, Fixed Size & Message Sign		SF	$	$
14	U-Section Post for Sign Supports - 3P		LF	$	$

Item No.	Description	Estimated Quantity	Unit of Measure	Unit Price	Total
15	Precast Concrete Wheel Stop		EA	$	
16	Beveled End Section for 24" Circular Pipe		EA	$	
17	Headwall for 24" Circular Pipe - 1 Line		EA	$	
18	24" RC Pipe Cul.- Class III		LF	$	
19	24" HDPE Pipe		LF	$	
20	18" HDPE Pipe		LF	$	
21	15" HDPE Pipe		LF	$	
22	12" HDPE Pipe		LF	$	
23	10" HDPE Pipe		LF	$	
24	Stormwater Cleanout Assembly		EA	$	
25	12" x 15" HDPE Reducing Fitting		EA	$	
26	15" x 18" HDPE Reducing Fitting		EA	$	
27	10" x 12" HDPE Wye Fitting		EA	$	
28	10" x 15" HDPE Wye Fitting		EA	$	
29	10" x 18" HDPE Wye Fitting		EA	$	
30	10" x 12" HDPE Wye Fitting		EA	$	
31	4' Dia. Precast Concrete Junction Box		EA	$	
32	Rip Rap (Class B)		TON	$	
33	Geotextile for Erosion Control Under Rip Rap (Class 2) Type B		SY	$	
34	Sediment Tube, includes maintenace		LF	$	
35	Rip Rap Sediment Dam, includes maintenace		TON	$	
36	Stone Check Dam, includes maintenance		TON	$	
37	Silt Fence, includes maintenance		LF		
38	Construction Access Road		SY	$	
39	Stabilized Construction Entrance		SY	$	
40	Temporary Erosion Control Blanket (ECB)		MSY	$	
41	Temporary Cover		AC	$	
42	Permanent Cover		AC	$	

TOTAL COST OF SUPPLEMENT A WORK AS BID **$ _____.**

END OF SUPPLEMENT A

SECTION 00 4322 - OFF-SITE UNIT PRICES FORM - SUPPLEMENT B - R2

PARTICULARS

The following is the list of Unit Prices referenced in the bid submitted by:

(Bidder) _____

TO (Owner) _____

dated _____ and which is an integral part of the Bid Form.

The following are Unit Prices for specific portions of the Work as listed, and are applicable to authorized variations from the Contract Documents.

These Unit Prices will be used to adjust Off-Site portions of the Work only. See Supplement A for Unit Prices associated with On-Site portions of the Work.

UNIT PRICES:

The following Unit Prices shall be utilized as noted in the Bid Documents to adjust the Contract Sum for the actual quantities of work performed, above or below the Bid quantities listed herein below by the Contractor. (See Specification Section 01 2100 and Section 01 2200):

UNIT PRICE LIST

Item No.	Description	Estimated Quantity	Unit of Measure	Unit Price	Total
1	Clearing & Grubbing w/n R.O.W.		AC	$	$
2	Removal & Disposal of Existing Chain-Linked Fence		LF	$	$
3	Removal of Existing Gravel Driveway		SY	$	$
4	Remove Existing Culvert (18" X 20')		EA	$	$
5	Unclassified Excavation		CY	$	$
6	Borrow Excavation		CY	$	$
7	Muck Excavation		CY	$	$
8	Fine Grading		SY	$	$
9	Graded Aggregate Base Course (8" Unif.)		SY	$	$
10	Prime Coat		GAL	$	$
11	Liquid Asphalt Binder PG64-22		TON	$	$
12	Hot Mix Asphalt Surface Coat - Type B		TON	$	$
13	Permanent Construction Signs (Ground Mounted)		SF	$	$

Item No.	Description	Estimated Quantity	Unit of Measure	Unit Price	Total
14	Pavement Markings (Temporary Paint) 4" Yellow Solid Lines		LF	$	$
15	Pavement Markings (Temporary Paint) - 24" White Solid Lines		LF	$	$
16	24" White Solid Lines (Stop/Diagonal Lines) - Thermoplastic 125 Mil.		LF	$	$
17	4" Yellow Solid Lines (Pvt. Edge Lines) Thermoplastic 90 Mil.		LF	$	$
18	Flat Sheet, Type III, Fixed Size & Message Sign		SF	$	$
19	U-Section Post for Sign Supports - 3P		LF	$	$
20	Headwall for 18" Circular Pipe - 1 Line		EA	$	$
21	Headwall for 30" Circular Pipe - 1 Line		EA	$	$
22	Headwall for 30" Circular Pipe - 2 Lines		EA	$	$
23	Headwall for 36" Circular Pipe - 3 Lines		EA	$	$
24	18" RC Pipe Cul. - Class III		LF	$	$
25	30" RC Pipe Cul. - Class III		LF	$	$
26	36" RC Pipe Cul. - Class III		LF	$	$
27	Catch Basin - Type 16		EA	$	$
28	36" x 36" Junction Box		EA	$	$
29	Concrete Curb & Gutter (1'-6") Vertical Face		LF	$	$
30	Concrete Flume		EA	$	$
31	Rip Rap (Class B)		TON	$	$
32	Geotextile for Erosion Control Under Rip Rap (Class 2) Type B		SY	$	$
33	Adjust Water Service Line		EA	$	$
34	Permanent Cover		AC	$	$
35	Temporary Cover		AC	$	$
36	Temporary Erosion Control Blanket (ECB)		MSY	$	$
37	Sediment Tubes		LF	$	$
38	Inlet Structure Filter - Type F (Weighted)		LF	$	$
39	Silt Fence		LF	$	$

Item No.	Description	Estimated Quantity	Unit of Measure	Unit Price	Total
40	Repair/Replace Silt Fence		LF	$	$
41	Removal of Silt Retained by Silt Fence		LF	$	$
42	Inlet Structure Filter - Type A		LF	$	$
43	Sediment Dam Riprap		TON	$	$
44	Stabilized Construction Entrance		SY	$	$
45	Inlet Filter Cleaning		EA	$	$

TOTAL COST SUPPLEMENT B WORK AS BID **$ _____.**

ALTERNATE 3

Item No.	Description	Estimated Quantity	Unit of Measure	Unit Price	Total
1	Graded Aggregate Base Course (6" Unif.)		SY	$	$
2	Portland Cement Concrete Pvmt. (6" Unif.)		SY	$	$
3	Graded Aggregate Base Course (8" Unif.)		SY	$	$
4	Prime Coat		GAL	$	$
5	Liquid Asphalt Binder PG64-22		TON	$	$
6	Hot Mix Asphalt Surface Course - Type B		TON	$	$

TOTAL COST OF ALTERNATE 3 WORK AS BID **$ _____.**

END OF SUPPLEMENT B

SECTION 03 4110 - PRECAST INSULATED STRUCTURAL CONCRETE PANELS - R1

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Precast prestressed insulated wall panels.

B. Grout packing.

C. Connection and supporting devices.

1.02 RELATED REQUIREMENTS

A. Section 03 3000 - Cast-in-Place Concrete.

B. Section 05 1200 - Structural Steel Framing.

C. Section 05 2100 - Steel Joist Framing.

D. Section 05 3100 - Steel Decking.

E. Section 07 9005 - Joint Sealers: Perimeter joints with sealant and backing.

1.03 REFERENCE STANDARDS

A. ACI 318 - Building Code Requirements for Structural Concrete and Commentary; American Concrete Institute International; 2011.

B. ASTM A 36/A 36M - Standard Specification for Carbon Structural Steel; 2008.

C. ASTM A 153/A 153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2009.

D. ASTM A 185/A 185M - Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete; 2007.

E. ASTM A416/A416M - Standard Specification for Steel Strand, Uncoated Seven-Wire for Prestress Concrete; 2012.

F. ASTM A 497/A 497M - Standard Specification for Steel Welded Wire Reinforcement, Deformed, for Concrete; 2007.

G. ASTM A 615/A 615M - Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement; 2012.

H. ASTM C150 - Standard Specification for Portland Cement; 2012.

I. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2010.

J. AWS D1.4/D1.4M - Structural Welding Code - Reinforcing Steel; American Welding Society; 2011.

K. PCI MNL-116 - Manual for Quality Control for Plants and Production of Structural Precast Concrete Products; Precast/Prestressed Concrete Institute; 1999, Fourth Edition.

L. PCI MNL-120 - PCI Design Handbook - Precast and Prestressed Concrete; Precast/Prestressed Concrete Institute; Seventh Edition, 2010.

M. PCI MNL-123 - Design and Typical Details of Connections for Precast and Prestressed Concrete; Precast/Prestressed Concrete Institute; 1998, Second Edition.

N. PCI MNL-135 - Tolerance Manual for Precast and Prestressed Concrete Construction; Precast/Prestressed Concrete Institute; 2000.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene a pre-installation conference one week prior to commencing work of this section.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Shop Drawings: Indicate layout, unit locations, fabrication details, unit identification marks, reinforcement, connection details, support items, dimensions, openings, and relationship to adjacent materials. Indicate design loads, deflections, cambers, bearing requirements, and special conditions.

C. Design Data: Submit design data reports indicating calculations for loadings and stresses of fabricated, designed framing.

D. Thermal Performance: Provide calculations complying with ASHRAE/IESNA Standard 90.1 and confirming the effective thermal resistance for the concrete sandwich wall system.
   1. Sandwich panel system is designed and configured to eliminate "thermal bridging" resulting from penetrations of insulation layer by highly conductive or non-insulating materials.
   2. Sandwich wall connecting system shall not reduce the thermal resistance of the wall assembly by more than two percent (2%) when R-value is calculated using the series parallel path method of calculation according to ASHRAE Fundamentals Handbook.

E. Provide documentation for Designer, Fabricator, Erector, and Welder qualifications.

1.06 QUALITY ASSURANCE

A. Designer Qualifications: Design precast concrete members under direct supervision of a Professional Structural Engineer experienced in design of precast concrete and licensed in South Carolina.

B. Fabricator Qualifications: Company specializing in manufacturing products specified in this section, with not less than five (5) years of documented experience.

C. Erector Qualifications: Company specializing in erecting products of this section with minimum three (3) years of documented experience.

D. Welder Qualifications: Qualified within previous 12 months in accordance with AWS D1.1 and AWS D1.4.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Handle precast members in position consistent with their shape and design. Lift and support only from support points.

B. Lifting or Handling Devices: Capable of supporting member in positions anticipated during manufacture, storage, transportation, and erection.

C. Protect members to prevent staining, chipping, or spalling of concrete.

D. Mark each member with date of production and final position in structure.

PART 2 PRODUCTS

2.01 PERFORMANCE REQUIREMENTS

A. Structural Performance: Design components to withstand the design loads in the configuration indicated on the drawings.

B. Thermal Performance:
   1. As a minimum, provide insulated concrete sandwich panels having an Assembly Maximum Value of U=0.123.

2. Solid zones in insulated panels will not be permitted above the finished floor and below top of the roof insulation. Solid zones are permitted below the bottom of the slab on grade. Otherwise, insulation shall be continuous between wythes throughout the panel.

2.02 MANUFACTURERS

A. Structural Precast Concrete:
1. Any manufacturer holding a PCI Group C Plant Certification for the types of products specified; see www.pci.org/find/manufacturer.
2. Substitutions: See Section 01 6000 - Product Requirements.

2.03 PRECAST UNITS

A. Precast Structural Concrete Units: Comply with PCI MNL-116, PCI MNL-120, PCI MNL-123, PCI MNL-135, ACI 318 and applicable codes.
1. Design components to withstand dead loads and design loads in the configuration indicated on the drawings.
2. Calculate structural properties of framing members in accordance with ACI 318.
3. Design members exposed to the weather to provide for movement of components without damage, failure of joint seals, undue stress on fasteners or other detrimental effects, when subject to seasonal or cyclic day/night temperature ranges.
4. Design system to accommodate construction tolerances, deflection of other building structural members and clearances of intended openings.

2.04 MATERIALS

A. Cement: Gray portland type, conforming to ASTM C 150, Type I.

B. Aggregate, Sand, Water, Admixtures: Determined by precast fabricator as appropriate to design requirements and PCI MNL-116.

2.05 REINFORCEMENT

A. Tensioning Steel Tendons: ASTM A 416/A 416M, Grade 250 (1720) or 270 (1860); seven-wire stranded steel cable; low-relaxation type; full length without splices; uncoated.

B. Reinforcing Steel: ASTM A 615/A 615M Grade 60 (420).
1. Plain billet-steel bars.
2. Unfinished.

C. Steel Welded Wire Reinforcement: ASTM A 185/A 185M plain type or ASTM A 497/A 497M deformed type; in flat sheets; unfinished.

D. Supports: Manufacturer's bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire fabric in place according to CRSI's "Manual of Standard Practice," PCI MNL 116 and as follows:
1. For thermally efficient panels provide glass-fiber and vinyl-ester polymer connectors.

2.06 STEEL CONNECTION MATERIALS

A. Connecting and Supporting Devices: Plates, angles, items cast into concrete, and inserts as follows:
1. Capable of supporting member in positions anticipated during manufacture, storage, transportation, and erection.
2. Materials:
a. Carbon-Steel Shapes and Plates: ASTM A36 (A 36M).
b. Carbon-Steel Head Studs: ASTM A 108, AISI 1018 through AISI 1020, cold finished; AWS D1.1, Type A or B, with arch shield.
c. Malleable Steel Castings: ASTM A 47 (A 47M).

d. Deformed-Steel Wire of Bar Anchors: ASTM A 496 or ASTM A 706 (A 706M).
e. Carbon-Steel Bolts and Studs: ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6); carbon-steel, heavy hex bolts and studs; carbon-steel nuts; and flat, unhardened steel washers.
f. Carbon-Steel Bolts and Studs: ASTM A 325 (A 325M), Type 1, heavy hex steel structural bolts, heavy hex carbon-steel nuts, and hardened carbon-steel washers.

3. Finish: For exterior steel items and items indicated for galvanizing, apply zinc coating by hot-dip process according to ASTM A 123 (A 123M) after fabrication, and ASTM A 153 (A 153M), as applicable.
   a. Galvanized Repair Paint: High-zinc-duct-content paint with dry film containing not less than 94 percent zinc dust by weight, and complying with DOD-P-21035A or SSPC-Paint 20.

2.07 ACCESSORIES

A. Connecting and Supporting Devices: Plates, angles, items cast into concrete, and items connected to steel framing members, and inserts as follows:
   1. Design: Capable of supporting member in positions anticipated during manufacture, storage, transportation, and erection.
   2. Material: Carbon steel conforming to ASTM A 36/A 36M. Galvanized when exposed to exterior.

B. Rigid Insulation Board: Provide either Expanded-Polystyrene, Extruded-Polystyrene or Polyisocyanurate Board in the thickness shown on drawings to meet the R-Value minimum.

C. Wythe Connectors: Manufactured to connect wythes of precast concrete panels.
   1. For thermally efficient panels provide glass-fiber and vinyl-ester polymer connectors or equivalent to meet thermal and structural criteria.

D. Grout:
   1. Non-shrink, non-metallic, minimum yield strength of 7,000 psi (48 MPa) at 28 days.

E. Bearing Pads: High density plastic, Vulcanized elastomeric compound molded to size, Neoprene (Chloroprene), or Tetrafluoroethylene(TFE); Shore A Durometer 25; 1/8 inch (3 mm) thick, smooth both sides.

F. Bolts, Nuts and Washers: High strength steel type recommended for structural steel joints.

G. Prime Paint: Zinc rich alkyd type.

2.08 FABRICATION

A. Conform to fabrication procedures specified in PCI MNL-116.

B. Maintain plant records and quality control program during production of precast members. Make records available upon request.

C. Ensure reinforcing steel, anchors, inserts, plates, angles, and other cast-in items are embedded and located as indicated on Drawings.

D. Provide required openings with a dimension larger than 10 inches (250 mm) and embed accessories provided under other sections of the specifications, at indicated locations.

2.09 FINISHES

A. Ensure exposed-to-view finish surfaces of precast concrete members are uniform in color and appearance.

B. Cure members under identical conditions to develop required concrete quality, and minimize appearance blemishes such as non-uniformity, staining, or surface cracking.

C. Finish members to PCI MNL-116 Finish B grade.

D. Plant Finish: Normal plant finish: Surface may contain small surface holes, less that 1/4-inch (6mm), caused by air bubbles, minor ships or spalling at edges or ends, without major discoloration.

E. Exposed-to-View Finish: Grind edges and remove fins and protrusions.
1. Exterior Faces: Normal plant bed finish.
2. Interior Faces: Light trowel finish.
3. Edges: Sack Rubbed finish.

2.10 FABRICATION TOLERANCES

A. Conform to fabrication tolerances specified in PCI MNL-135 .

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that site conditions are ready to receive work and field measurements are as shown on Drawings.

3.02 PREPARATION

A. Prepare support equipment for the erection procedure, temporary bracing, and induced loads during erection.

3.03 ERECTION

A. Erect members without damage to structural capacity, shape, or finish. Replace or repair damaged members.

B. Align and maintain uniform horizontal and vertical joints, as erection progresses.

C. Maintain temporary bracing in place until final support is provided. Protect members from staining.

D. Provide temporary lateral support to prevent bowing, twisting, or warping of members.

E. Install bearing pads.

F. Grout base of wall panels.

G. Secure units in place. Perform welding in accordance with AWS D1.1.

3.04 TOLERANCES

A. Erect members level and plumb within allowable tolerances.

B. Conform to PCI MNL-135 for erection tolerances.

C. When members cannot be adjusted to conform to design or tolerance criteria, cease work and advise Architect. Execute modifications as directed.

3.05 PROTECTION

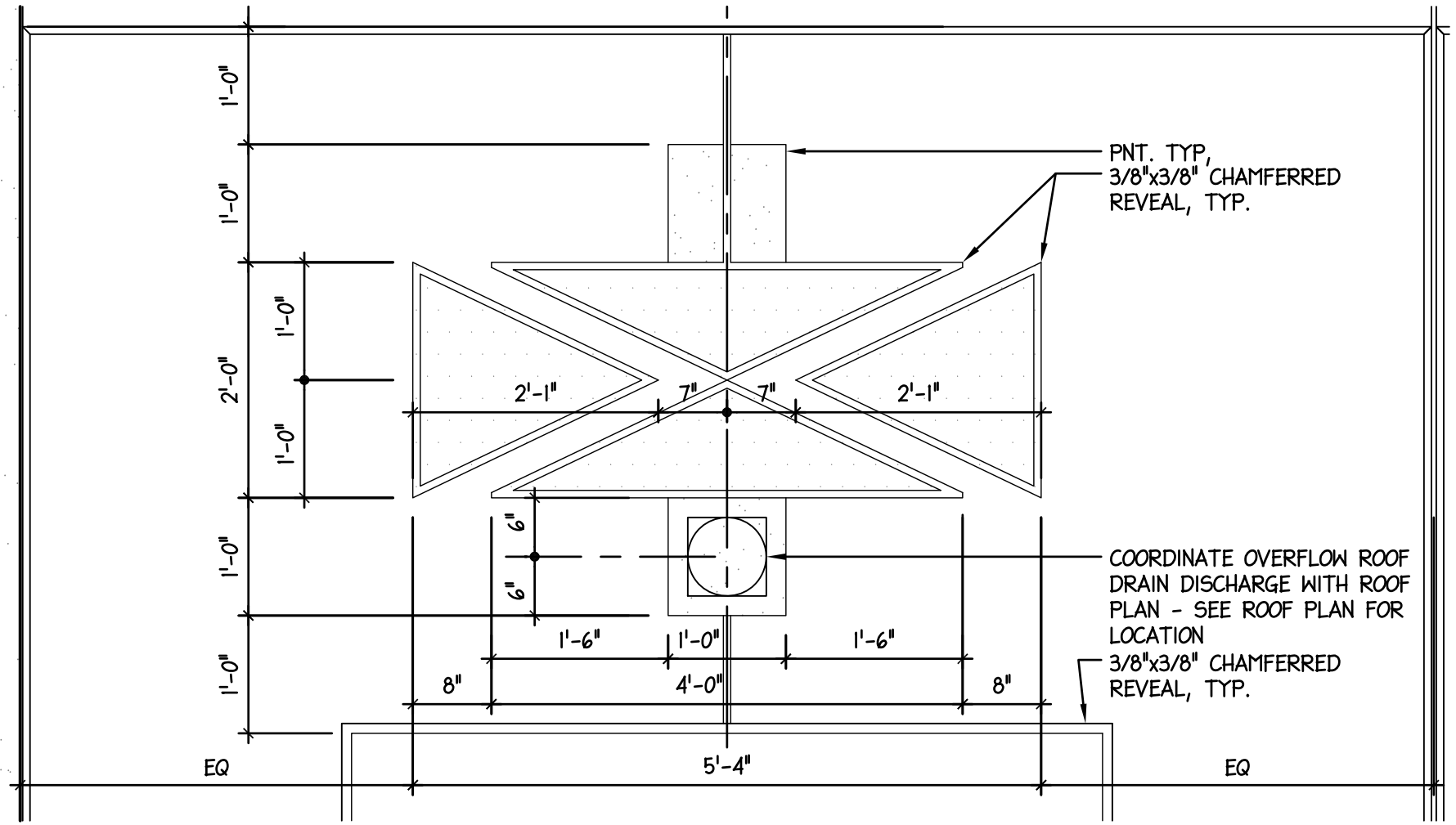
A. Protect members from damage caused by field welding or erection operations.

3.06 CLEANING

A. Clean weld marks, dirt, or blemishes from surface of exposed members.

3.07 SCHEDULES

END OF SECTION



3
A201
A201

CORNER ENTRY ELEVATION DETAILS

SCALE: 3/4" =1'-0"

CARLISLE ASSOCIATES

ARCHITECTS ENGINEERS

1015 GERVAIS STREET
COLUMBIA, SOUTH CAROLINA
29201 803-252-3232

PROJECT TITLE

COLLETON CO.
SC

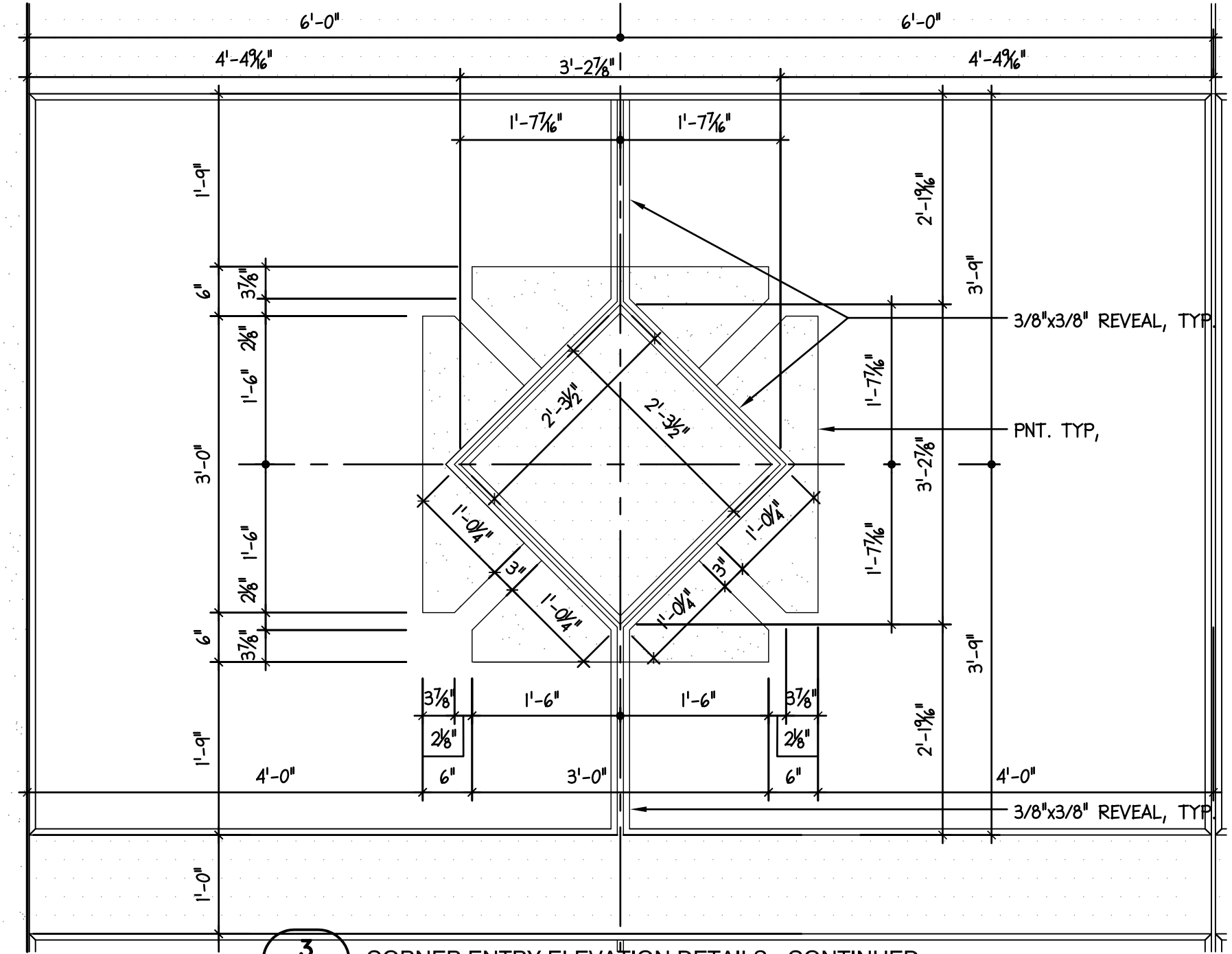
3/A201
CLARAFICATION

C336
ADD4
SK1

DATE: 10/18/13

DWG NAME:
C336_PLAN.DWG

DWN BY:EJN



3
A201
A201

CORNER ENTRY ELEVATION DETAILS - CONTINUED

SCALE: 3/4" =1'-0"

CARLISLE ASSOCIATES

ARCHITECTS ENGINEERS

1015 GERVAIS STREET
COLUMBIA, SOUTH CAROLINA
29201 803-252-3232

PROJECT TITLE

COLLETON CO. SC

3/A201 CLARAFICATION

C336
ADD4
SK2

DATE: 10/18/13

DWG NAME: C336_PLAN.DWG

DWN BY:EJN