



City of Myrtle Beach
SOUTH CAROLINA

PURCHASING AND
MATERIALS MANAGEMENT

(843) 918-2170
FAX: (843) 918-2182

ADDENDUM 003

21-B0001

Charlie's Place

August 17, 2020

Please find attached updated bid tab and Geotechnical Services Infiltration Testing report which was inadvertently omitted from the previous Addendum.

Thank you,

Ruth Burleson Garigen/Buyer
City of Myrtle Beach/ Purchasing

DOCUMENT 004322 - UNIT PRICES FORM

1.1 BID INFORMATION

- A. Bidder: _____
- B. Project Name: Charlie's Place Phase 2, Part 2 - Sitework
- C. Owner: The City of Myrtle Beach
- D. Engineer: DDC Engineers, Inc.
- E. Engineer Project Number: 18100PB

1.2 BID FORM SUPPLEMENT

- A. This form is required to be attached to the Bid Form.
- B. The project is a unit price contract.

1.3 UNIT PRICES

Item	Description	Engr's Est.	Unit	Unit Price	Amount
1.	Mobilization	1	LS	\$	\$
2.	Bonds	1	LS	\$	\$
3.	Unclassified Excavation (All Excavated Material to be Spread On-Site as Directed by Owner)	260	CYDS	\$	\$
4.	Subbase Preparation	7,845	SF	\$	\$
5.	Furnish and Install Permeable Interlocking Concrete Paver (Herringbone Pattern)	7,845	SF	\$	\$
6.	2" of #89 Compacted Setting Stone Bedding	7,845	SF	\$	\$
7.	4" of #57 Compacted Stone Base Material	7,845	SF	\$	\$
8.	6" of #4 Compacted Stone Subbase	7,845	SY	\$	\$
9.	6" x 12" Reinforced Concrete Curb	560	LF	\$	\$
10.	Dimpled Membrane	195	LF	\$	\$
11.	4" of #57 (Between Curb and Building) includes Weed Barrier below, #57 Stone	5.6	CYDS	\$	\$
12.	Seeding	240	SYDS	\$	\$

TOTAL BID: _____

Total Amount: _____
In words Dollars

1.4 SUBMISSION OF BID SUPPLEMENT

- A. Respectfully submitted this ____ day of _____, 2020.
- B. Submitted By: _____ (Insert name of bidding firm or corporation).
- C. Authorized Signature: _____ (Handwritten signature).
- D. Signed By: _____ (Type or print name).
- E. Title: _____ (Owner/Partner/President/Vice President).

END OF DOCUMENT 004322



December 18, 2018

DDC Engineers
1320 Professional Drive
Myrtle Beach, South Carolina 29577

Attention: Mr. Eric Sanford, P.E.

Reference: **Report of Geotechnical Services**
Carver Street – Infiltration Testing
Myrtle Beach, South Carolina
S&ME Project No. 1463-18-050-107

Dear Mr. Stanford:

S&ME, Inc. has completed limited soil infiltration testing for the referenced project after receiving authorization to proceed from you on December 3, 2018. Our work was conducted in general accordance with our *Proposal for Geotechnical Services*, S&ME Proposal No. 14-1800704 dated December 3, 2018.

The purpose of this work was to measure the infiltration rate of the soils at the site at two locations requested by the client. This report describes our understanding of the project and presents the results of the field testing.

◆ Site and Project Description

Project information was initially provided in a telephone conversation between Tommy Still (S&ME) and Eric Sanford (DDC Engineers) on November 30, 2018. In this call Mr. Sanford explained that he is working on two projects for the City of Myrtle Beach to explore drainage improvement options. Mr. Sanford requested two percolation tests at each of the two project sites, for a total of four tests.

Down-hole percolation test methods through a hand augered boring was the preferred test method per these conversations. A follow up email to Mr. Still from Mr. Sanford supplied us with four PDF documents, including an aerial photograph of each site, the plat layout of the area around the tests on Calhoun Drive, and a Proposed Site Plan drawn by DDC Engineers for Charlies Place on Carver Street. Requested percolation test locations were noted on the sketch of Charlies Place drawn by DDC, and on the aerial photographs of Carver Street and Calhoun Drive. We understand the requested test depth to be between about 3 to 4 feet beneath the existing surface. Mr. Sanford also requested that the reports be presented separately for each site.

This report represents the findings from the Carver Street site testing only.



Site Description

The project site is located on Carver Street, near its intersection with 21st Avenue, at an old abandoned motel site in Myrtle Beach, South Carolina. Part of the old motel still remains, but construction appears to have already begun on the main portion of the site. A Site Vicinity Map is provided as Figure 1 in the appendix.

◆ Exploration Procedures

On December 11, 2018, representatives from our firm visited the site. Using the information provided, we performed the following primary tasks. A Test Location Sketch is attached as Figure 2.

1. We initially advanced a boring at each of the two requested test locations (P-1 and P-2) to a depth of approximately 3 to 4 feet.
2. We then performed a down-hole infiltration test within each of the borings. Once the infiltration testing was complete, the hand auger borings were each advanced to their target termination depth of 5 feet.
3. Groundwater was encountered at a shallower depth in boring P-2 than in boring P-1; therefore, the infiltration test was performed at a shallower depth at this location than at test location P-1.
4. The soils encountered in the hand auger boring were visually classified in general accordance with ASTM D 2488, "Standard Practice for Description and Identification of Soils (Visual-Manual Procedure)." The Hand Auger Boring Logs, which presents the subsurface soil classifications, are attached in the appendix. The strata contact lines represent approximate boundaries between soil types. The actual transitions between soil types in the field are likely more gradual in both the vertical and horizontal directions than those which are indicated on the log. No laboratory testing was performed on the recovered samples.

◆ Surface Conditions

At the time of our exploration, both of the test locations had been stripped of any organic topsoil or pavement at the ground surface. Some loose gravel and construction materials were scattered across the surface of the site. There is a slight slope downward from the Carver Street side of the site to the back of the buildings. Ground surface elevations were not directly surveyed by S&ME, and no site specific topographic plan was made available to us at the time of this assessment.

The surface soils were generally moist at the time of exploration due to a recent rainfall. We did not observe any areas of ponded surface water on the site.

◆ Subsurface Conditions

The generalized subsurface conditions at the test locations are described below. For more detailed descriptions and stratifications at a test location, the hand auger boring logs should be reviewed in the appendix.

Sand Mixtures

Underlying the loose gravel and other construction debris, poorly graded sands (USCS Classification "SP") and poorly graded sands with silt (SP-SM) were encountered to the termination depth of both of our hand auger



borings at a depth of 5 feet. These varied in color between brown, gray, white, black and orange. The soils were moist to wet upon recovery.

Soil Survey Information

According to the *Soil Survey of Horry County, South Carolina* prepared by the United States Department of Agriculture, Soil Conservation Service (USDA SCS), the mapped near-surface soils at the site appear to consist primarily of the soil series listed in Table 1.

Table 1: Soil Survey Data

Soil Series (Symbol)	Typical Near-Surface Soil Types	Typical Infiltration Rates	Available Storage Capacity	Reported Depth to Water Table
Centenary Fine Sands (Ce)	0"-80" – Fine Sands	6 inches per hour to 20 inches per hour	Low 3.6 inches	About 42 inches
Leon Fine Sands (Le)	0"-72" - Sands	1 inch per hour to 6 inches per hour	Very Low 2.8 inches	About 0 to 12 inches

It is important to note that the *Soil Survey* mapping data only considers the upper 6 feet of the natural soil profile.

Both of the infiltration tests we performed were within the Centenary Fine Sands (Ce) soil series. Additional construction illustrated on the *Proposed Site Plan* provided to us by Mr. Sanford, dated November 30, 2018 and drawn by DDC Engineers, to the west of the existing structures are located in a different soil series. The data for this soil series is included in the table above, but it is important to note that neither of the infiltration tests was located in the Leon Fine Sands (Le) series. It is also noteworthy that the Leon Fine Sands may have a lower infiltration rate and storage capacity based on the published *Soil Survey* data.

Measured Infiltration Rate

Stabilized (saturated) infiltration testing was performed at both test locations. Table 2 below summarizes the infiltration rates measured at each test location. For a record of the infiltration test data, please see Table 3 in the appendix.

Table 2: Infiltration Rates

Test Location	Test Depth	Estimated Soil Type at Test Depth	Infiltration Rate (inches per hour)	Qualitative Infiltration Class
P-1	3.5 feet	Poorly Graded Sand (SP)	6.9	Rapid
P-2	3 feet	Poorly Graded Sand (SP)	7.8	Rapid



The test at P-1 was performed at a depth of about 3.5 feet below the ground surface, within a layer of white poorly graded sand. The results indicated a stabilized saturated flow of **6.9 inches per hour (iph)**. The *Soil Survey* classifies this infiltration rate as “rapid”. The test at P-2 was performed at a depth of 3 feet within a similar white poorly graded sand. This test was performed a few inches shallower to avoid ground water. The results indicated a stabilized saturated flow of **7.8 inches per hour (iph)**. The *Soil Survey* classifies this infiltration rate as “rapid”. These values agree with the typical range of published infiltration rates of the Centenary Fine Sands soil series that each test was performed within.

When choosing the value for infiltration rate that is ultimately used in design, the designer needs to consider the variability of the soils and understand that a slight change in the silt or clay fines content could have a significant impact upon the infiltration rate. As silt or clay content increases, infiltration rate is likely to decrease.

Groundwater

At the time of this exploration, groundwater was not encountered at test location P-1 within the upper 5 feet of soil. However, the lower white sands were wet upon recovery. At test location P-2, the groundwater is slightly lower in elevation, encountered at a depth of 3 feet causing caving of the wet, sandy soils.

Groundwater levels may fluctuate seasonally at the site, being influenced by rainfall variation and other factors. Site construction activities can also influence water elevations.

◆ Limitations of Report

This report has been prepared in accordance with generally accepted geotechnical engineering practice for specific application to this project. No other warranty, express or implied, is made. The nature and extent of variations of the soils at the site to those encountered at our test location may not become evident until construction. If variations appear evident, then we should be provided the opportunity to re-evaluate the findings of this report. In the event that any changes in the nature, design, or location of the project are planned, the conclusions contained in this report will not be considered valid unless the changes are reviewed and conclusions modified or verified in writing by the submitting engineers.

Assessment of site environmental conditions; seasonal high water table evaluation, sampling of soils, ground water or other materials for environmental contaminants; identification of jurisdictional wetlands, rare or endangered species, geological hazards or potential air quality and noise impacts were beyond the scope of this work. The information gathered and reported during this limited exploratory work may only be used for drainage design and planning purposes. No other use is authorized by S&ME.



◆ Closure

S&ME, Inc. appreciates the opportunity to have provided our services on this project. If you have any questions concerning this report, please do not hesitate to contact us.

Sincerely,

S&ME, Inc.

Kara Fugate
Kara Fugate, E.I.T.
Geotechnical Staff Professional

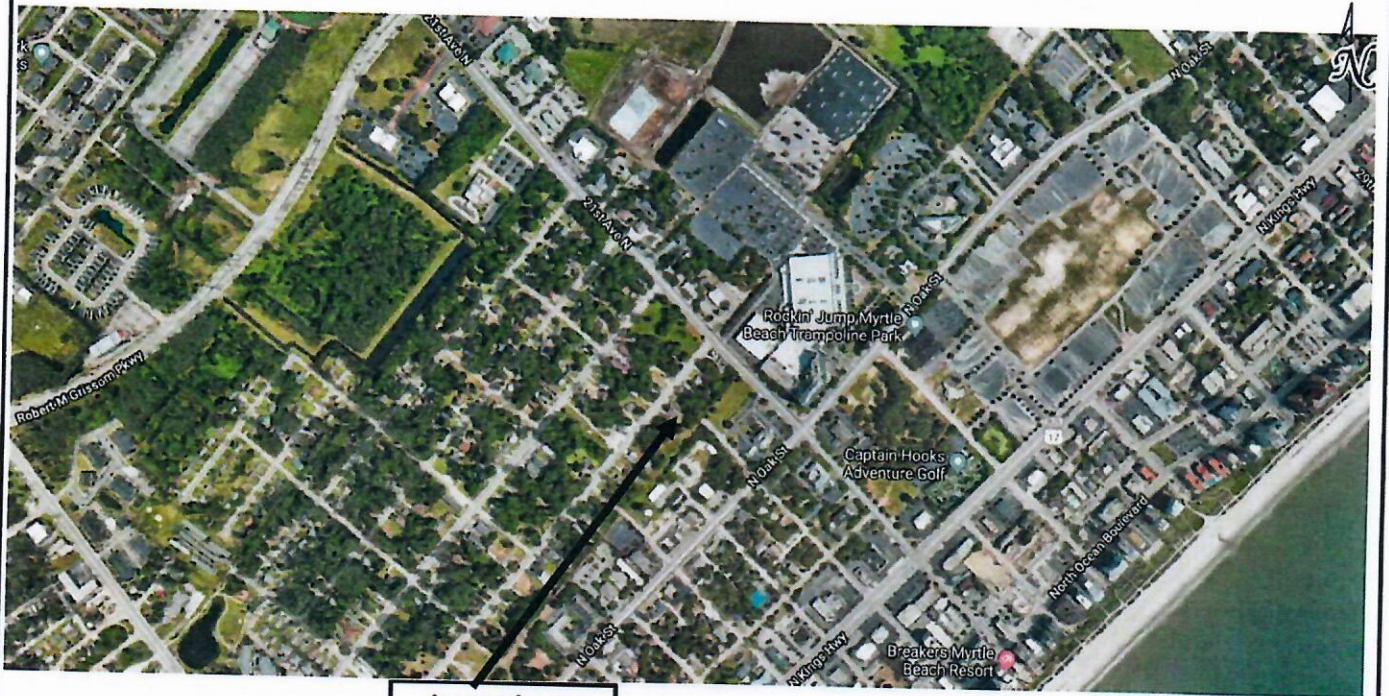


Ronald P. Forest, Jr.
Ronald P. Forest, Jr., P.E.
Senior Engineer
Registration No. SC-21248



Attachments: Appendix

Attachments: Appendix



Approximate Site Vicinity

	Site Vicinity Map		SCALE: AS SHOWN	FIGURE NO. 1
	Carver Street Infiltration Testing Carver Street Myrtle Beach, South Carolina		DATE: 12/12/18 PROJECT NUMBER 1463-18-050-107	



Legend
 ☒ Infiltration Testing Location



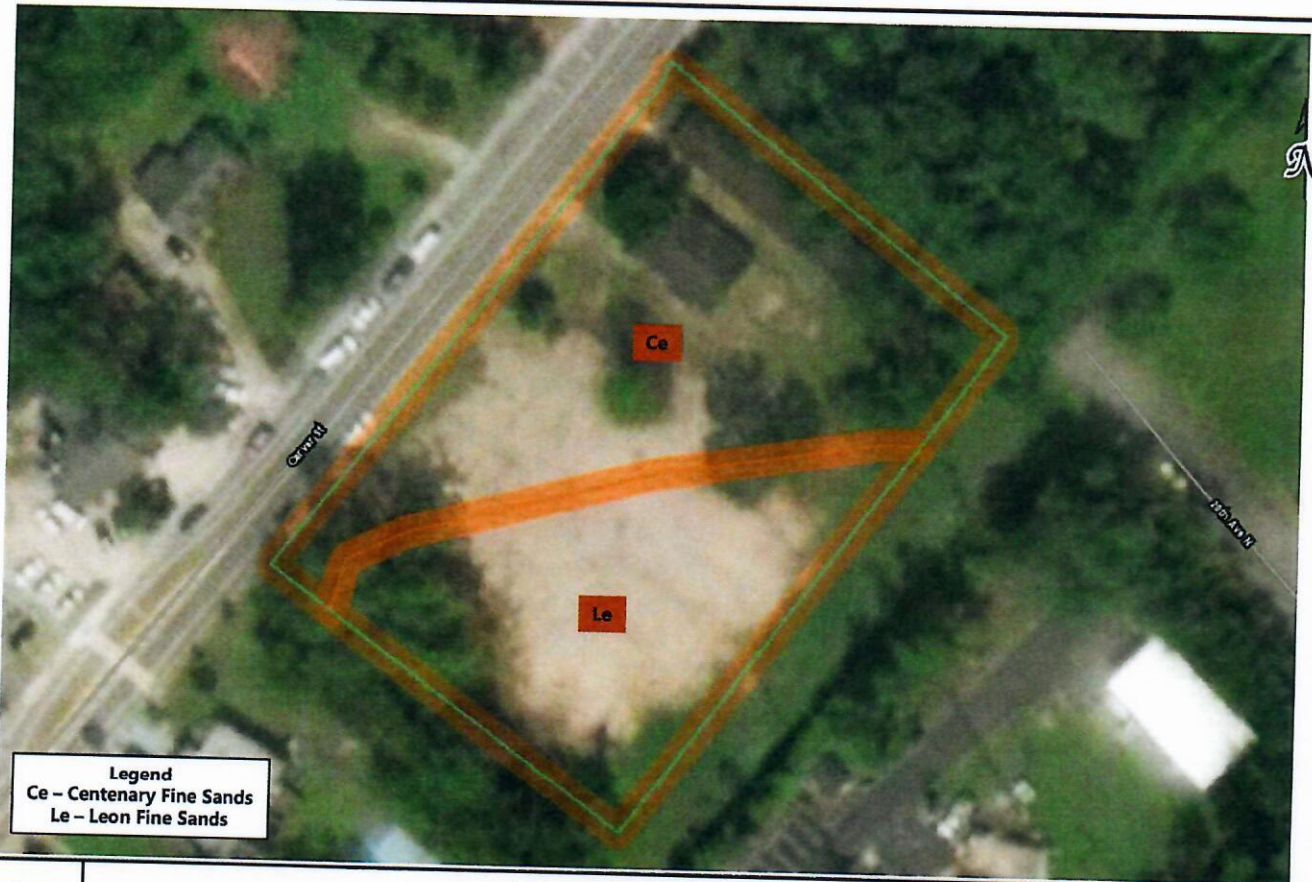
Test Location Sketch

Carver Street Infiltration Testing
 Carver Street
 Myrtle Beach, South Carolina

SCALE: AS SHOWN
DATE: 12/11/18
PROJECT NUMBER 1463-18-050-107

FIGURE NO.

2



Legend
 Ce - Centenary Fine Sands
 Le - Leon Fine Sands



Soil Survey

Carver Street Infiltration Testing
 Carver Street
 Myrtle Beach, South Carolina

SCALE:
 AS SHOWN
 DATE:
 12/12/18
 PROJECT NUMBER
 1463-18-050-107

FIGURE NO.

3

◆ Summary of Exploration Procedures

The American Society for Testing and Materials (ASTM) publishes standard methods to explore soil, rock and ground water conditions in Practice D-420-98, "Standard Guide to Site Characterization for Engineering Design and Construction Purposes." The boring and sampling plan must consider the geologic or topographic setting. It must consider the proposed construction. It must also allow for the background, training, and experience of the geotechnical engineer. While the scope and extent of the exploration may vary with the objectives of the client, each exploration includes the following key tasks:

- Reconnaissance of the Project Area
- Preparation of Exploration Plan
- Layout and Access to Field Sampling Locations
- Field Sampling and Testing of Earth Materials
- Laboratory Evaluation of Recovered Field Samples
- Evaluation of Subsurface Conditions

The standard methods do not apply to all conditions or to every site. Nor do they replace education and experience, which together make up engineering judgment. Finally, ASTM D 420 does not apply to environmental investigations.

◆ Reconnaissance of the Project Area

We walked over the site to note land use, topography, ground cover, and surface drainage. We observed general access to proposed sampling points and noted any existing structures.

Checks for Hazardous Conditions - State law requires that we notify the South Carolina (SC 811) before we drill or excavate at any site. SC 811 is operated by the major water, sewer, electrical, telephone, CATV, and natural gas suppliers of South Carolina. SC 811 forwarded our location request to the participating utilities. Location crews then marked buried lines with colored flags within 72 hours. They did not mark utility lines beyond junction boxes or meters. We checked proposed sampling points for conflicts with marked utilities, overhead power lines, tree limbs, or man-made structures during the site walkover.

◆ Boring and Sampling

Hand Auger Borings

Auger borings were advanced using hand-operated augers. The soils encountered were identified in the field by cuttings brought to the surface. Representative samples of the cuttings were placed in plastic bags and transported to the laboratory. Soil consistency was qualitatively estimated by the relative difficulty of advancing the augers. Penetration resistance was not measured in the hand auger borings; density characterization was based upon the relative difficulty of advancing the auger.

Water Level Measurement

Subsurface water levels in the boreholes were measured during the onsite exploration by measuring depths from the existing grade to the current water level using a tape.

Constant Head Field Permeability Test

The infiltration rate of water through the near surface soil was measured using a downhole infiltration test, or constant head permeability test. The test consists of a PVC pipe with a closed end, a section of screening, and an open end. A funnel is attached to the open end and the closed end is placed into the bore hole at a desired depth. Bentonite was used at the bottom, where the PVC starts but before the screen, and at the top of the screen to encourage water to flow to the sides rather than up and down. The rate of flow or infiltration into the soils by measuring the amount of water required to maintain a constant head over an interval of time.

Backfilling of Borings

Once subsurface water levels were obtained, boring spoils were backfilled into the open bore holes. Bore holes were backfilled to the existing ground surface.

TABLE 3: PERCOLATION TEST RESULTS

Legend:
 L Length of intake zone (cm)
 m Transformation Ratio (SQRT(Kh/Kv))
 D Diameter of intake zone (cm)
 Hc Estimated constant piezometric head (cm)
 q Flow rate (cu.cm./sec)

Conversions:
 1 Quart 946.353 cu.cm.
 1 Fl.Oz. 29.57 cu.cm.
 1 Ft. 30.48 cm

Qualitative Classifications(1):

Very Slow	<0.06 iph
Slow	.06-0.2 iph
Mod. Slow	0.2-0.6 iph
Moderate	0.6-2.0 iph
Mod. Rapid	2.0-6.0 iph
Rapid	6.0-20 iph
Very Rapid	>20 iph

(1): Soil Conservation Service (USDA)

DRAFT Ver.: 3/30/2015

Test Location	Bottom of Screen Depth (ft.)	Exposed Length L (cm)	Trfrm Ratio "m"	Hole Diameter D (cm)	Piezometric Head Hc (cm)	Measured Flow			Flow q cu.cm./s	Permeability	
						q1 Qrts./sec	q2 Fl.Oz./sec	q3 ml/sec		K (cm/sec)	K (in./hr.)
P-1	3.5	26.67	3	8.255	139.7						
P-2	3	26.67	3	8.255	139.7			38.666667	38.666667	4.90E-03	6.9
								43.666667	43.666667	5.53E-03	7.8

SOIL CLASSIFICATION CHART

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

MAJOR DIVISIONS			SYMBOLS		TYPICAL DESCRIPTIONS	
			GRAPH	LETTER		
COARSE GRAINED SOILS MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	GRAVEL AND GRAVELLY SOILS MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	CLEAN GRAVELS (LITTLE OR NO FINES)		GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES	
		GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES	
		GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES	
		GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES	
	SAND AND SANDY SOILS MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE	CLEAN SANDS (LITTLE OR NO FINES)		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES	
				SP	POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES	
		SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SM	SILTY SANDS, SAND - SILT MIXTURES	
				SC	CLAYEY SANDS, SAND - CLAY MIXTURES	
			SILTS AND CLAYS LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
					CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
SILTS AND CLAYS LIQUID LIMIT GREATER THAN 50		OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY			
		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS			
		CH	INORGANIC CLAYS OF HIGH PLASTICITY			
HIGHLY ORGANIC SOILS		OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS			
		PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS			



PROJECT: Carver Street Infiltration Testing
 Myrtle Beach, South Carolina
 1463-18-050-107

HAND AUGER BORING LOG: P-1

DATE STARTED: 12/11/18 DATE FINISHED: 12/11/18

NOTES:
 Elevation unknown.

SAMPLING METHOD: Hand Auger PERFORMED BY: K. Fugate

WATER LEVEL: Not encountered.

Depth (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION (feet)	WATER LEVEL
		POORLY GRADED SAND WITH GRAVEL (SP) - Mostly fine to medium sand, trace fines, trace subround gravel, tan, moist.		
		POORLY GRADED SAND (SP) - Mostly fine to medium sand, trace fines, dark brown, moist.		
1	----- Orange.			
2				
3	----- Tan, wet.			
4				
5		Boring terminated at 5 ft		



DCP INDEX IS THE DEPTH (IN.) OF PENETRATION PER BLOW OF A 10.1 LB HAMMER FALLING 22.6 IN., DRIVING A 0.79 IN. O.D. 60 DEGREE CONE.

PROJECT: **Carver Street Infiltration Testing**
 Myrtle Beach, South Carolina
 1463-18-050-107

HAND AUGER BORING LOG: P-2

DATE STARTED: **12/11/18** DATE FINISHED: **12/11/18**

NOTES:
 Elevation unknown.

SAMPLING METHOD: **Hand Auger** PERFORMED BY: **K. Fugate**

WATER LEVEL: **3' ATD**

Depth (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION (feet)	WATER LEVEL
1		<p>POORLY GRADED SAND (SP) - Mostly fine to medium sand, trace fines, brown, moist.</p> <p>----- Tan.</p> <p>----- White, wet.</p>		-
2			-	
3			▽	
4			-	
5			-	

Boring terminated at 5 ft



DCP INDEX IS THE DEPTH (IN.) OF PENETRATION PER BLOW OF A 10.1 LB HAMMER FALLING 22.6 IN., DRIVING A 0.79 IN. O.D. 60 DEGREE CONE.