



May 9, 2005

SCDOT Soils Laboratory  
1406 Shop Road  
Columbia, South Carolina 29202

Attention: Mr. M.L. Wilson, Project Design Engineer

Reference: **RESULTS OF SOIL TEST BORINGS**  
RBO South Fork Edisto River & Cedar Creek, SC 4/302  
Aiken County, South Carolina  
SCDOT File No. 2.127B.01, SCDOT PIN No. 26432  
S&ME Project No. 1611-04-386

Dear Mr. Wilson:

As requested, a representative of S&ME, Inc. was present at the above referenced site from January 31st, through March 4th, 2005 to conduct soil test borings. Borings were originally planned to be conducted within the floodplain along the new road and bridge alignment of SC Hwy. 4/302, but due to drill rig access problems, the borings were offset to the existing roadway and bridges. Borings B-27 and B-28 and CPT sounding B-30 were conducted in the floodplain near the new proposed centerline since these areas were accessible. Borings were conducted at the proposed stationing given by SCDOT.

Four roadway borings (B-1 through B-4) were conducted west of the existing bridge over the South Fork Edisto River. At the South Fork Edisto River Bridge, borings were conducted at the end bent #1 (B-5), interior bents #2 through #19 (~~B-2~~ through B-23), and end bent #20 (B-24). Five roadway borings (B-25 through B-29) were conducted between the South Fork Edisto River Bridge and the Cedar Creek Bridge. At the Cedar Creek Bridge, borings were conducted at the end bent #1 (B-30), interior bents 2&3 (B-31 & B-32), and end bent 4 (B-33). Two roadway borings (B-34 & B-35) were conducted east of the Cedar Creek Bridge.

B-6

Borings (B-1 through B-20, B-22, B-23, B-25 through B-29, B-31 through B-35) were conducted with conventional drill rigs using mud rotary and hollow-stem auger drilling techniques. CPT soundings (B-21, B-24, B-30) were conducted with a truck mounted electronic cone penetrometer (CPT). A pore pressure dissipation test was conducted in CPT sounding B-24 near the base of the fill, about 16 feet below the existing roadway surface. All borings/soundings projected were completed to their planned depths except CPT soundings B-24 and B-30, which met tip refusal. Boring B-21 was first conducted as a CPT sounding through the bridge deck until the casing broke. The boring was extended from that depth to its planned depth with a conventional drill rig. Where borings were conducted from the existing road or bridge, drilling depths were increased to account for fill encountered or space between the bridge deck and ground surface.

It should be noted that Artesian pressure was encountered in the bridge borings, though it was not evident at what depth the pressure was encountered. The deep borings where Artesian pressure was encountered were flushed with water and plugged with bentonite hole plug. A creosote odor was noted in borings B-15, B-17, and B-23 and is noted on the respective boring log.

Borings in the existing road were backfilled by S&ME, Inc. with auger cuttings and patched with cold patch upon completion of drilling. Borings in the existing bridge decks were left open upon completion of drilling and the local SCDOT maintenance shop was notified that they would need to patch the holes in the bridge deck.

Water level elevations at the South Fork Edisto River Bridge boring locations ranged from 12.8 to 14.6 feet below the existing roadway surface. Water level elevations at the Cedar Creek Bridge boring locations ranged from 6 to 9.8 feet below the existing roadway surface. Water level elevations at roadway borings ranged from 10 to 14 feet below the existing roadway surface. Water level elevations at roadway borings conducted within the floodplain were generally 1 foot or less below the existing ground.



The results of our soil test borings are attached as individual "Test Boring Records". Station numbers supplied by SCDOT were utilized to locate the borings. Station numbers were marked in the field by others, and borings were located by measuring from the survey stakes. Offsets to the proposed new centerline were utilized as noted on the log. The location of each boring is shown in the "Log of Boring" area of each Test Boring Record. All station numbers and offsets are referenced from the new proposed centerline. Soils were classified in general accordance with ASTM D 2488. The soil samples will be retained at our laboratory until SCDOT requests them or until completion of the new roadway and bridges.

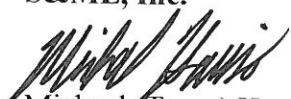
Laboratory testing was conducted on samples as requested by Mr. Nick Harman with SCDOT and the results are attached as individual laboratory data sheets. A few of the requested tests were not conducted because there was not a sufficient amount of soil sample recovered to run all of the requested tests.

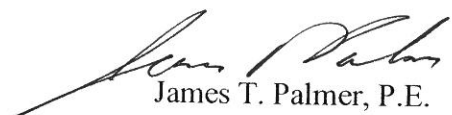
Environmental assessment of soils, water, wetlands and endangered species was not included in our scope of service for this project. The boring log information is intended for SCDOT's engineering interpretation of the data collected.

S&ME, Inc. appreciates this opportunity to work with SCDOT as your local geotechnical consultant on this project. Our engineers and technicians can assist you with laboratory testing of the soil samples collected, or additional exploration work at any stage of your project. If you have any questions or need any further information in regard to this letter, please do not hesitate to contact us at 803-561-9024.

Very truly yours,

S&ME, Inc.

  
Michael (Trapp) Harris, E.I.T.  
Staff Professional

  
James T. Palmer, P.E.  
Engineering Dept. Manager

Attachments: Test Boring Records, Laboratory Data Sheets

# **APPENDIX**



<b>RBO South Fork Edisto River and Cedar Creek</b> <b>Aiken County, South Carolina</b> <b>File #: 2.127B.01, PIN#: 26432, S&amp;ME #: 1611-04-386</b>					<b>LOG OF BORING No. B-1</b> Station: 503+00 Offset: 24 ft. L of C/L					
Date Drilled: 02/11/05			Supervisor: TH			Notes: <b>Final Boring Log (05/05/05).</b> BK-51 Drill Rig.				
Casing Length: N/A			Ground Elevation: 273.0							
Hammer Type: <input type="checkbox"/> Gravity <input checked="" type="checkbox"/> Automatic <input type="checkbox"/> Other:										
Water Level: Hole cave @ 11.5 ft.			Drilling Method: HSA							
Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	N Value	STD. PENETRATION TEST DATA (blows/ft)
	0.0	Top of existing road.								5   10   20   40   70
	0.4	ASPHALT - approximately 5 inches of asphalt.		1.0	SS-1	12	10	7	17	
		POORLY GRADED SAND (SP) - mostly fine to medium sand, trace fines, dry to moist, orange, medium dense to very loose.		3.5	SS-2	3	2	1	3	
268.0		- orangish tan, loose.		6.0	SS-3	3	2	3	5	
		- yellow, medium dense.		8.5	SS-4	8	6	6	12	
263.0		- orange, wet, loose.		13.5	SS-5	3	5	5	10	
258.0	15.0	Boring Terminated at 15 feet.								
253.0										
248.0										
243.0										
238.0										

**LEGEND**

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
ST - Shelby Tube	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

**RBO South Fork Edisto River and Cedar Creek****Aiken County, South Carolina****File #: 2.127B.01, PIN#: 26432, S&ME #: 1611-04-386****LOG OF BORING No. B-2**

Station:

507+00

Offset:

39 ft. L of C/L

Date Drilled: 02/11/05

Supervisor: TH

Casing Length: N/A

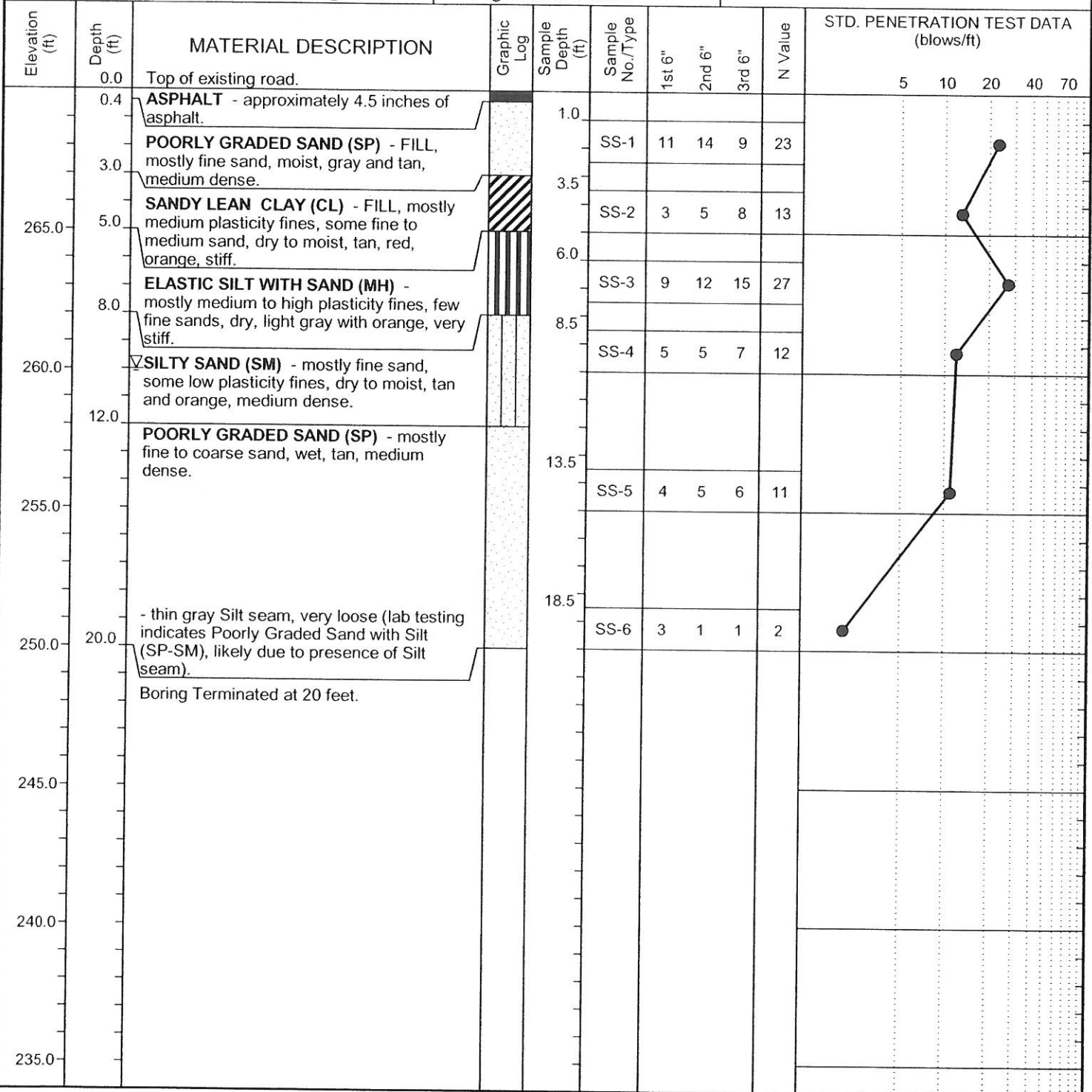
Ground Elevation: 270.0

Hammer Type: ☐ Gravity ☒ Automatic ☐ Other:

Water Level: 10 ft. @ TOB. Cave @ 10.5 ft.

Drilling Method: HSA

Notes:

**Final Boring Log (05/05/05). BK-51**  
Drill Rig.**LEGEND**

**SAMPLER TYPE**  
SS - Split Spoon  
ST - Shelby Tube  
AWG - Rock Core, 1-1/8"  
NQ - Rock Core, 1-7/8"  
CU - Cuttings  
CT - Continuous Tube

**DRILLING METHOD**  
HSA - Hollow Stem Auger  
CFA - Continuous Flight Augers  
DC - Driving Casing  
RW - Rotary Wash  
RC - Rock Core





# RBO South Fork Edisto River and Cedar Creek

Aiken County, South Carolina

File #: 2.127B.01, PIN#: 26432, S&ME #: 1611-04-386

## LOG OF BORING No. B-3

Station:

510+00

Offset:

39 ft. L of C/L

Date Drilled: 02/04/05

Supervisor: TH

Casing Length: N/A

Ground Elevation: 270.0

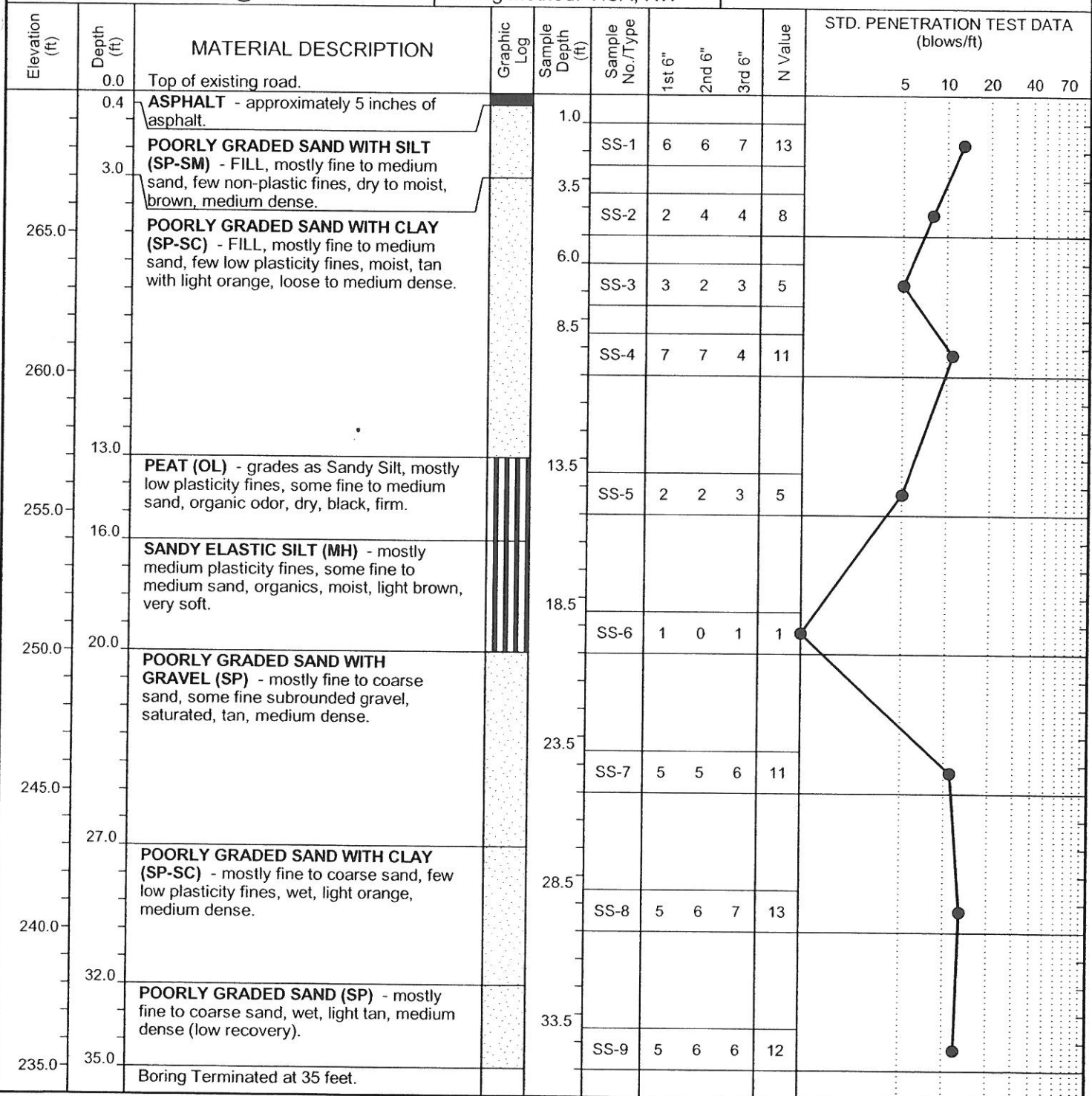
Hammer Type: ☐ Gravity ☒ Automatic ☐ Other:

Notes:

**Final Boring Log (05/05/05).** BK-51 Drill Rig. Pushed Shelby tubes at 15 and 20 feet with only a small amount of sand recovered.

Water Level: Hole cave @ 11.5 ft.

Drilling Method: HSA, RW



### LEGEND

**SAMPLER TYPE**  
 SS - Split Spoon  
 ST - Shelby Tube  
 AWG - Rock Core, 1-1/8"  
 NQ - Rock Core, 1-7/8"  
 CU - Cuttings  
 CT - Continuous Tube

**DRILLING METHOD**  
 HSA - Hollow Stem Auger  
 CFA - Continuous Flight Augers  
 DC - Driving Casing  
 RW - Rotary Wash  
 RC - Rock Core



# RBO South Fork Edisto River and Cedar Creek

Aiken County, South Carolina

File #: 2.127B.01, PIN#: 26432, S&ME #: 1611-04-386

## LOG OF BORING No. B-4

Station:

513+00

Offset:

36.5 ft. L of C/L

Date Drilled: 02/04/05

Supervisor: TH

Notes:

**Final Boring Log (05/05/05).** Mobile B-57 Drill Rig.

Casing Length: N/A

Ground Elevation: 270.0

Hammer Type: ☒ Gravity ☐ Automatic ☐ Other:

Water Level: 14 ft. @ TOB.

Drilling Method: HSA, RW

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	N Value	STD. PENETRATION TEST DATA (blows/ft)				
	0.0	Top of existing road.								5	10	20	40	70
	0.5	ASPHALT - approximately 6 inches of asphalt.		1.0	SS-1	6	7	8	15					
		CLAYEY SAND (SC) - FILL, mostly fine to medium sand, some low to medium plasticity fines, moist, tan and orange, medium dense.		3.5										
265.0	5.5	- decrease in fines content.			SS-2	7	6	8	14					
		POORLY GRADED SAND WITH CLAY (SP-SC) - FILL, mostly fine to medium sand, few low plasticity fines, moist, tan, medium dense to loose.		6.0										
				8.5										
260.0					SS-3	4	6	6	12					
					SS-4	4	4	5	9					
	12.0	SILTY SAND (SM) - mostly fine to medium sand, some low plasticity fines, wet, dark brown, very loose.		13.5										
255.0					SS-5	2	2	2	4					
	17.0	POORLY GRADED SAND (SP) - mostly fine to medium sand, wet, light tan, very dense.		18.5										
250.0					SS-6	11	25	35	60					
	22.0	POORLY GRADED SAND WITH SILT AND GRAVEL (SP-SM) - mostly fine to coarse sand, few non-plastic fines, few fine subrounded gravel, wet, orange, medium dense.		23.5										
245.0					SS-7	12	12	14	26					
	27.0	POORLY GRADED SAND (SP) - mostly fine to medium sand, wet, tan and dark gray, dense.		28.5										
240.0					SS-8	16	17	15	32					
		- tan, medium dense.		33.5										
235.0	35.0	Boring Terminated at 35 feet.			SS-9	17	15	14	29					

### LEGEND

SAMPLER TYPE  
 SS - Split Spoon  
 ST - Shelby Tube  
 AWG - Rock Core, 1-1/8"  
 NQ - Rock Core, 1-7/8"  
 CU - Cuttings  
 CT - Continuous Tube

DRILLING METHOD  
 HSA - Hollow Stem Auger  
 CFA - Continuous Flight Augers  
 DC - Driving Casing  
 RW - Rotary Wash  
 RC - Rock Core



## RBO South Fork Edisto River and Cedar Creek

Aiken County, South Carolina

File #: 2.127B.01, PIN#: 26432, S&amp;ME #: 1611-04-386

## LOG OF BORING No. B-5

Station:

516+97

Offset:

39 ft. L of C/L

Date Drilled: 01/31/05

Supervisor: TH

Notes:

**Final Boring Log (05/05/05).** Mobile B-57 Drill Rig. Hollow stem auger 0-20.5 ft. Mud rotary with drag bit 20.5-90 ft.

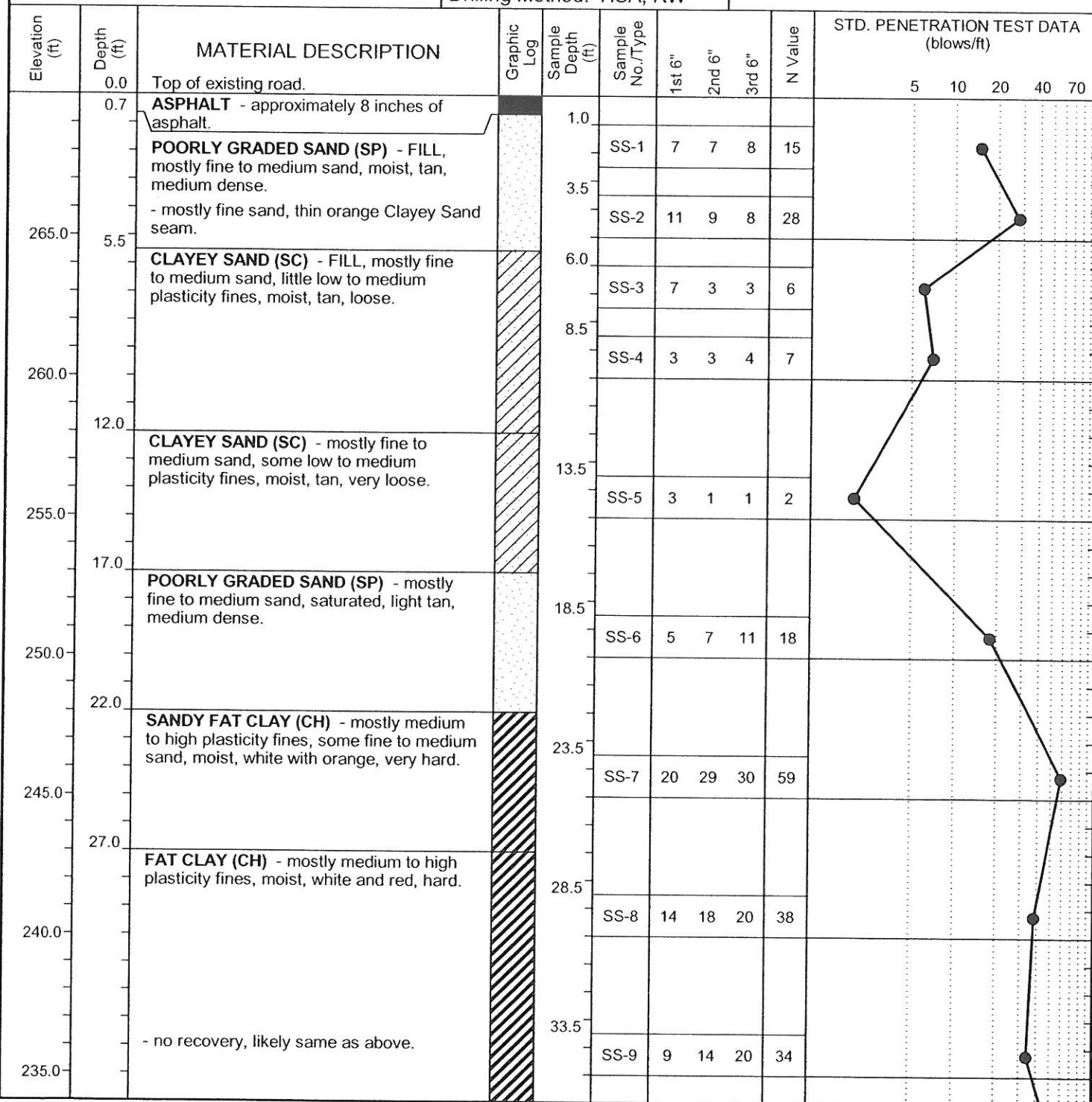
Casing Length: N/A

Ground Elevation: 270.0

Hammer Type: ☒ Gravity ☐ Automatic ☐ Other:

Water Level:

Drilling Method: HSA, RW



## LEGEND

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## SAMPLER TYPE

SS - Split Spoon  
ST - Shelby Tube  
AWG - Rock Core, 1-1/8"

NQ - Rock Core, 1-7/8"  
CU - Cuttings  
CT - Continuous Tube

## DRILLING METHOD

HSA - Hollow Stem Auger  
CFA - Continuous Flight Augers  
DC - Driving Casing

RW - Rotary Wash  
RC - Rock Core



RBO South Fork Edisto River and Cedar Creek

Aiken County, South Carolina

File #: 2.127B.01, PIN#: 26432, S&ME #: 1611-04-386

# LOG OF BORING No. B-5

Station:

516+97

Offset:

39 ft. L of C/L

Date Drilled: 01/31/05

Supervisor: TH

Casing Length: N/A

Ground Elevation: 270.0

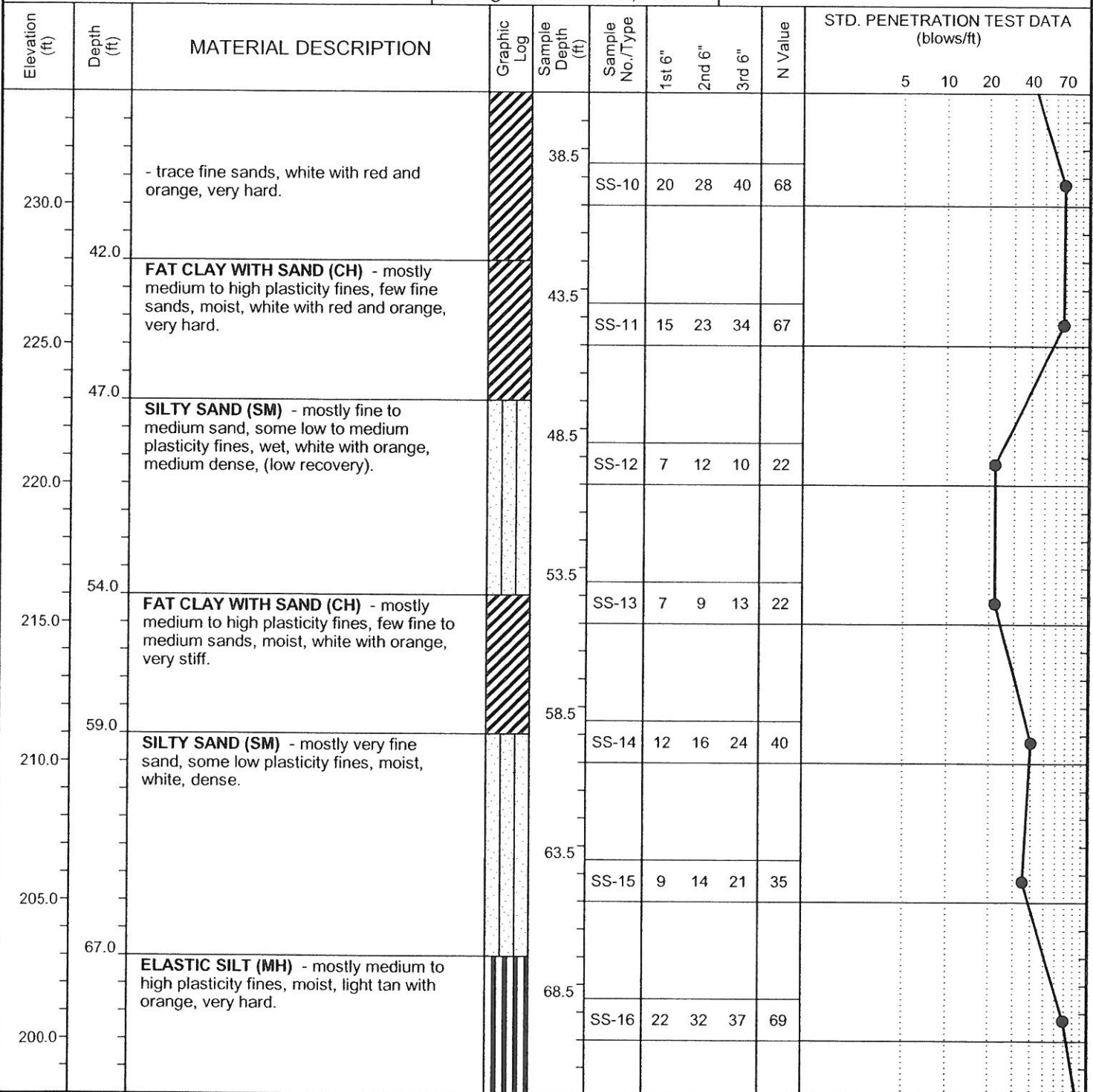
Hammer Type: ☒ Gravity ☐ Automatic ☐ Other:

Water Level:

Drilling Method: HSA, RW

Notes:

**Final Boring Log (05/05/05).** Mobile B-57 Drill Rig. Hollow stem auger 0-20.5 ft. Mud rotary with drag bit 20.5-90 ft.



## LEGEND

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**SAMPLER TYPE**  
 SS - Split Spoon  
 ST - Shelby Tube  
 AWG - Rock Core, 1-1/8"  
 NQ - Rock Core, 1-7/8"  
 CU - Cuttings  
 CT - Continuous Tube

**DRILLING METHOD**  
 HSA - Hollow Stem Auger  
 CFA - Continuous Flight Augers  
 DC - Driving Casing  
 RW - Rotary Wash  
 RC - Rock Core





RBO South Fork Edisto River and Cedar Creek

Aiken County, South Carolina

File #: 2.127B.01, PIN#: 26432, S&ME #: 1611-04-386

# LOG OF BORING No. B-5

Station:

516+97

Offset:

39 ft. L of C/L

Date Drilled: 01/31/05

Supervisor: TH

Casing Length: N/A

Ground Elevation: 270.0

Hammer Type: ☒ Gravity ☐ Automatic ☐ Other:

Water Level:

Drilling Method: HSA, RW

Notes:

**Final Boring Log (05/05/05).** Mobile B-57 Drill Rig. Hollow stem auger 0-20.5 ft. Mud rotary with drag bit 20.5-90 ft.

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	N Value	STD. PENETRATION TEST DATA (blows/ft)				
										5	10	20	40	70
195.0	77.0	- white.		73.5	SS-17	40	44	50/4"	50/4"					
190.0		<b>SILTY SAND (SM)</b> - mostly fine to medium sand, some low to medium plasticity fines, saturated, purple and white, very dense.		78.5	SS-18	29	40	44	84					
185.0		- white, decrease in sand particle size.		83.5	SS-19	16	27	29	56					
180.0	90.0	- mostly fine to coarse sand, white and light red.		88.5	SS-20	28	39	50/5"	50/5"					
		Boring Terminated at 90 feet.												
175.0														
170.0														
165.0														

## LEGEND

### SAMPLER TYPE

SS - Split Spoon  
ST - Shelby Tube  
AWG - Rock Core, 1-1/8"

NQ - Rock Core, 1-7/8"  
CU - Cuttings  
CT - Continuous Tube

### DRILLING METHOD

HSA - Hollow Stem Auger  
CFA - Continuous Flight Augers  
DC - Driving Casing

RW - Rotary Wash  
RC - Rock Core



## RBO South Fork Edisto River and Cedar Creek

Aiken County, South Carolina

File #: 2.127B.01, PIN#: 26432, S&amp;ME #: 1611-04-386

## LOG OF BORING No. B-6

Station:

517+42

Offset:

38 ft. L of C/L

Date Drilled: 02/01/05

Supervisor: TH

Notes:

**Final Boring Log (05/05/05).** Mobile B-57 Drill Rig. Driving casing 0-25 ft. Mud rotary with drag bit 25-91.5 ft. Artesian pressure encountered.

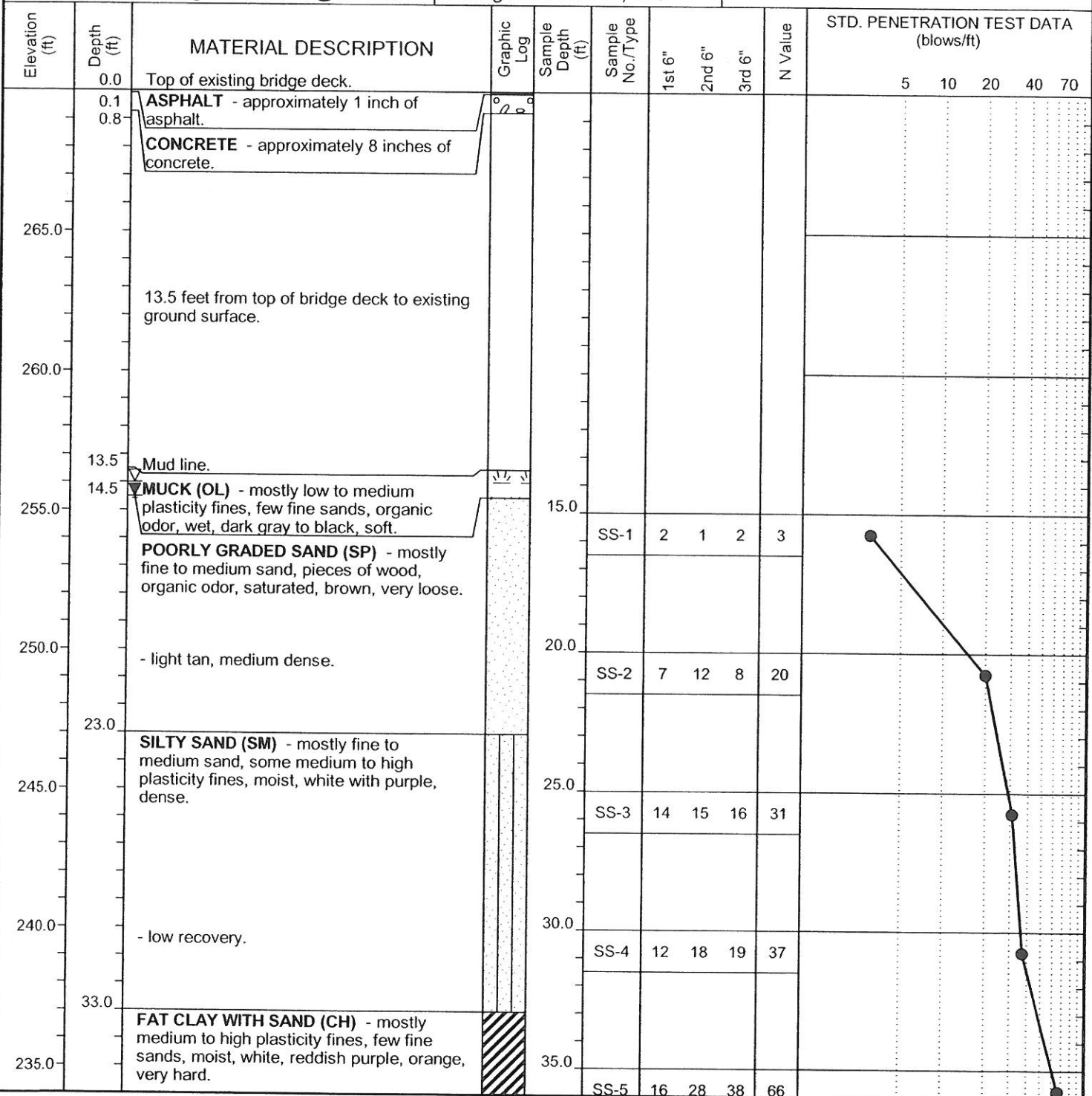
Casing Length: 25 ft.

Ground Elevation: 270.0

Hammer Type: ☒ Gravity ☐ Automatic ☐ Other:

Water Level: 14 ft. @ TOB. 14.5 @ 24 hrs.

Drilling Method: DC, RW



## LEGEND

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SAMPLER TYPE  
SS - Split Spoon  
ST - Shelby Tube  
AWG - Rock Core, 1-1/8"  
NQ - Rock Core, 1-7/8"  
CU - Cuttings  
CT - Continuous Tube

DRILLING METHOD  
HSA - Hollow Stem Auger  
CFA - Continuous Flight Augers  
DC - Driving Casing  
RW - Rotary Wash  
RC - Rock Core



RBO South Fork Edisto River and Cedar Creek

Aiken County, South Carolina

File #: 2.127B.01, PIN#: 26432, S&amp;ME #: 1611-04-386

## LOG OF BORING No. B-6

Station:

517+42

Offset:

38 ft. L of C/L

Date Drilled: 02/01/05

Supervisor: TH

Casing Length: 25 ft.

Ground Elevation: 270.0

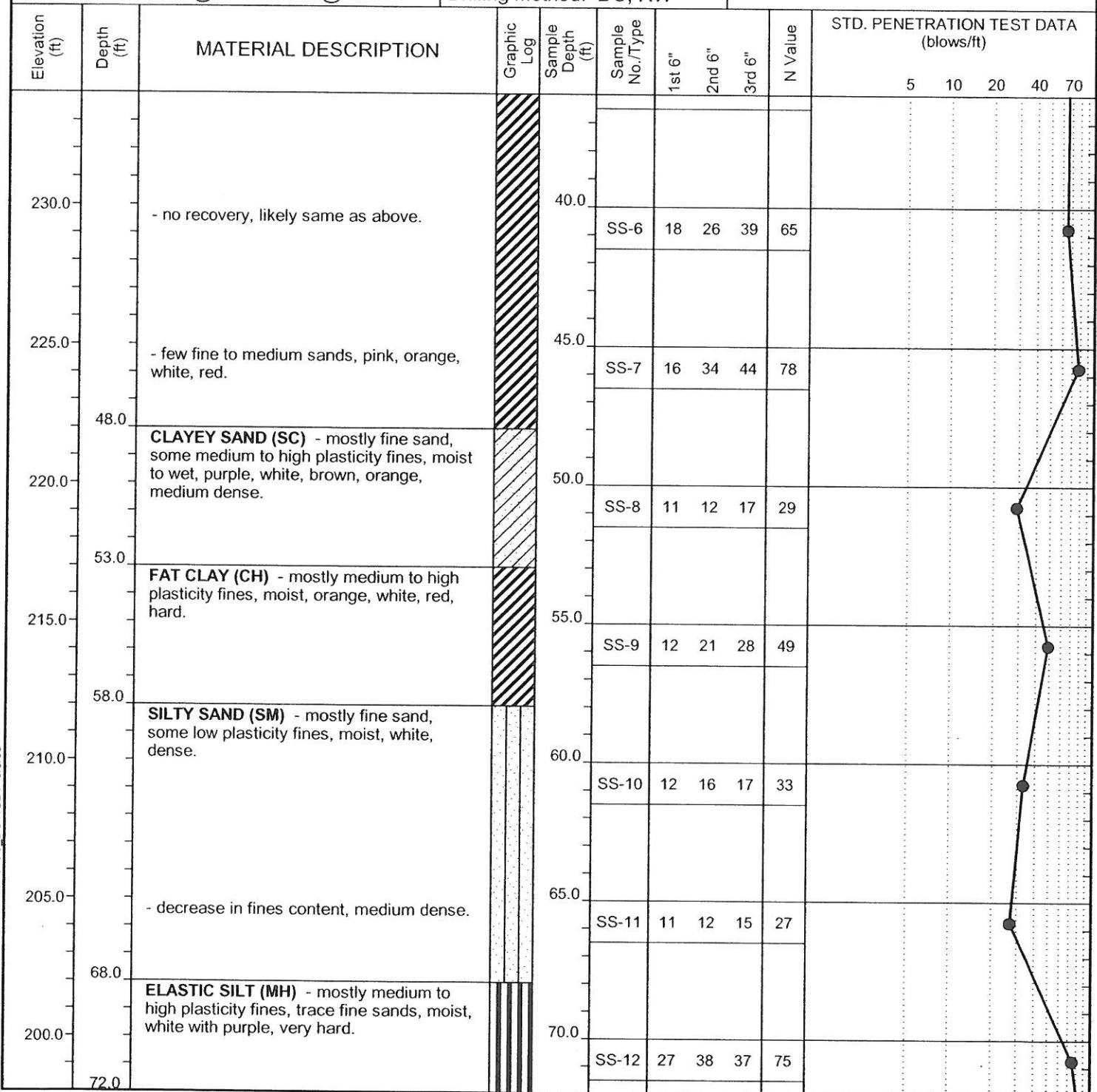
Hammer Type: ☒ Gravity ☐ Automatic ☐ Other:

Water Level: 14 ft. @ TOB. 14.5 @ 24 hrs.

Drilling Method: DC, RW

Notes:

**Final Boring Log (05/05/05).** Mobile B-57 Drill Rig. Driving casing 0-25 ft. Mud rotary with drag bit 25-91.5 ft. Artesian pressure encountered.



## LEGEND

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SAMPLER TYPE  
SS - Split Spoon  
ST - Shelby Tube  
AWG - Rock Core, 1-1/8"

NQ - Rock Core, 1-7/8"  
CU - Cuttings  
CT - Continuous Tube

DRILLING METHOD  
HSA - Hollow Stem Auger  
CFA - Continuous Flight Augers  
DC - Driving Casing

RW - Rotary Wash  
RC - Rock Core



RBO South Fork Edisto River and Cedar Creek

Aiken County, South Carolina

File #: 2.127B.01, PIN#: 26432, S&amp;ME #: 1611-04-386

## LOG OF BORING No. B-6

Station:

517+42

Offset:

38 ft. L of C/L

Date Drilled: 02/01/05

Supervisor: TH

Casing Length: 25 ft.

Ground Elevation: 270.0

Hammer Type: ☒ Gravity ☐ Automatic ☐ Other:

Water Level: 14 ft. @ TOB. 14.5 @ 24 hrs.

Drilling Method: DC, RW

Notes:

**Final Boring Log (05/05/05).** Mobile B-57 Drill Rig. Driving casing 0-25 ft. Mud rotary with drag bit 25-91.5 ft. Artesian pressure encountered.

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" 2nd 6" 3rd 6"			N Value	STD. PENETRATION TEST DATA (blows/ft)				
						1st 6"	2nd 6"	3rd 6"		5	10	20	40	70
195.0	75.5	<b>SILTY SAND (SM)</b> - mostly fine to medium sand, some medium plasticity fines, wet, white, very dense.		75.0										
	78.0	<b>ELASTIC SILT (MH)</b> - mostly medium to high plasticity fines, trace fine sands, moist, light tan, very hard.			SS-13	22	50/5"		50/5"					
190.0		<b>SILTY SAND (SM)</b> - mostly fine to medium sand, some medium plasticity fines, moist, white and purple, dense.		80.0										
					SS-14	11	18	21	39					
185.0		- 1 inch brown Poorly Graded Sand seam, white.		85.0										
					SS-15	9	11	16	27					
180.0		- white and orange.		90.0										
	91.5	Boring Terminated at 91.5 feet.			SS-16	6	11	22	33					
175.0														
170.0														
165.0														

## LEGEND

**SAMPLER TYPE**  
SS - Split Spoon NQ - Rock Core, 1-7/8"  
ST - Shelby Tube CU - Cuttings  
AWG - Rock Core, 1-1/8" CT - Continuous Tube

**DRILLING METHOD**  
HSA - Hollow Stem Auger RW - Rotary Wash  
CFA - Continuous Flight Augers RC - Rock Core  
DC - Driving Casing







# RBO South Fork Edisto River and Cedar Creek

Aiken County, South Carolina

File #: 2.127B.01, PIN#: 26432, S&ME #: 1611-04-386

## LOG OF BORING No. B-7

Station:

517+72

Offset:

38 ft. L of C/L

Date Drilled: 02/08/05

Supervisor: TH

Casing Length: 26 ft.

Ground Elevation: 270.0

Hammer Type: ☒ Gravity ☐ Automatic ☐ Other:

Notes:

**Final Boring Log (05/05/05).** Mobile B-57 Drill Rig. Driving casing 0-26 ft. Mud rotary with drag bit 26-92.5 ft. Artesian pressure encountered.

Water Level: 14.5 ft. @ TOB.

Drilling Method: DC, RW

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" 2nd 6" 3rd 6"			N Value	STD. PENETRATION TEST DATA (blows/ft)				
										5	10	20	40	70
230.0		- white, pink, purple, red.		41.0	SS-5	18	28	32	60					
225.0		- trace fine sands, white, red, orange.		46.0	SS-6	20	31	31	62					
220.0	49.0	<b>SILTY SAND (SM)</b> - mostly fine to medium sand, some medium plasticity fines, moist, white, dense.		51.0	SS-7	20	29	44	73					
215.0	54.0	<b>FAT CLAY (CH)</b> - mostly medium to high plasticity fines, moist, white, red, orange, hard.		56.0	SS-8	11	18	25	43					
210.0		- slight decrease in plasticity, white and purple.		61.0	SS-9	15	18	24	42					
205.0	64.0	<b>SILTY SAND (SM)</b> - mostly fine to medium sand, little low to medium plasticity fines, wet, white, dense.		66.0	SS-10	11	18	24	42					
200.0	69.0	<b>ELASTIC SILT (MH)</b> - mostly medium plasticity fines, moist, pink, very hard.		71.0	SS-11	13	17	22	39					
					SS-12	18	38	40	78					

### LEGEND

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SAMPLER TYPE  
 SS - Split Spoon  
 ST - Shelby Tube  
 AWG - Rock Core, 1-1/8"  
 NQ - Rock Core, 1-7/8"  
 CU - Cuttings  
 CT - Continuous Tube

DRILLING METHOD  
 HSA - Hollow Stem Auger  
 CFA - Continuous Flight Augers  
 DC - Driving Casing  
 RW - Rotary Wash  
 RC - Rock Core



RBO South Fork Edisto River and Cedar Creek

Aiken County, South Carolina

File #: 2.127B.01, PIN#: 26432, S&amp;ME #: 1611-04-386

## LOG OF BORING No. B-7

Station:

517+72

Offset:

38 ft. L of C/L

Date Drilled: 02/08/05

Supervisor: TH

Casing Length: 26 ft.

Ground Elevation: 270.0

Hammer Type: ☒ Gravity ☐ Automatic ☐ Other:

Water Level: 14.5 ft. @ TOB.

Drilling Method: DC, RW

Notes:

**Final Boring Log (05/05/05).** Mobile B-57 Drill Rig. Driving casing 0-26 ft. Mud rotary with drag bit 26-92.5 ft. Artesian pressure encountered.

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	N Value	STD. PENETRATION TEST DATA (blows/ft)				
										5	10	20	40	70
195.0		- white.		76.0	SS-13	36	50/5"		50/5"					
190.0	79.0	<b>SILTY SAND (SM)</b> - mostly fine to medium sand, some low to medium plasticity fines, moist, white and purple, dense.		81.0	SS-14	19	20	26	46					
185.0		- 1" white Elastic Silt seam.		86.0	SS-15	16	23	25	48					
180.0		- decrease in fines content, white and purple, very dense.		91.0	SS-16	19	27	29	56					
175.0	92.5	Boring Terminated at 92.5 feet.												
170.0														
165.0														

## LEGEND

## SAMPLER TYPE

SS - Split Spoon  
ST - Shelby Tube  
AWG - Rock Core, 1-1/8"

NQ - Rock Core, 1-7/8"  
CU - Cuttings  
CT - Continuous Tube

## DRILLING METHOD

HSA - Hollow Stem Auger  
CFA - Continuous Flight Augers  
DC - Driving Casing

RW - Rotary Wash  
RC - Rock Core



## RBO South Fork Edisto River and Cedar Creek

Aiken County, South Carolina

File #: 2.127B.01, PIN#: 26432, S&amp;ME #: 1611-04-386

## LOG OF BORING No. B-8

Station:

518+02

Offset:

38.5 ft. L of C/L

Date Drilled: 02/10/05

Supervisor: TH

Notes:

**Final Boring Log (05/05/05).** BK-51  
Drill Rig. Driving casing 0-28.4 ft. Mud  
rotary with drag bit 28.4-90.8 ft. Artesian  
pressure encountered.

Casing Length: 28.4 ft.

Ground Elevation: 270.0

Hammer Type: ☐ Gravity ☒ Automatic ☐ Other:

Water Level: 14.6 ft. @ TOB.

Drilling Method: DC, RW

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	N Value	STD. PENETRATION TEST DATA (blows/ft)				
	0.0	Top of existing bridge deck.								5	10	20	40	70
	0.1	ASPHALT - approximately 1 inch of asphalt.												
	0.8	CONCRETE - approximately 8 inches of concrete.												
265.0														
		14.6 feet from top of bridge deck to existing ground surface.												
260.0														
255.0	14.6	Mud line.		14.6	SS-1 WOH				WOH					
	18.0	CLAYEY SAND (SC) - mostly fine sand, some medium to high plasticity fines, wet, gray, very loose.												
250.0		POORLY GRADED SAND (SP) - mostly fine to medium sand, wet, tan, loose to medium dense.		19.2	SS-2	3	4	4	8					
245.0	24.6	SILTY SAND (SM) - mostly fine to medium sand, some medium to high plasticity fines, moist, white, medium dense.		23.5	SS-3	9	12	16	28					
240.0		- mostly fine to coarse sand, wet, purple, loose.		29.3	SS-4	4	4	5	9					
235.0	33.0	FAT CLAY (CH) - mostly medium to high plasticity fines, dry, white, hard.		34.3	SS-5	10	15	22	37					

## LEGEND

Continued Next Page

SAMPLER TYPE  
SS - Split Spoon NQ - Rock Core, 1-7/8"  
ST - Shelby Tube CU - Cuttings  
AWG - Rock Core, 1-1/8" CT - Continuous Tube

DRILLING METHOD  
HSA - Hollow Stem Auger RW - Rotary Wash  
CFA - Continuous Flight Augers RC - Rock Core  
DC - Driving Casing





RBO South Fork Edisto River and Cedar Creek

Aiken County, South Carolina

File #: 2.127B.01, PIN#: 26432, S&amp;ME #: 1611-04-386

## LOG OF BORING No. B-8

Station:

518+02

Offset:

38.5 ft. L of C/L

Date Drilled: 02/10/05

Supervisor: TH

Casing Length: 28.4 ft.

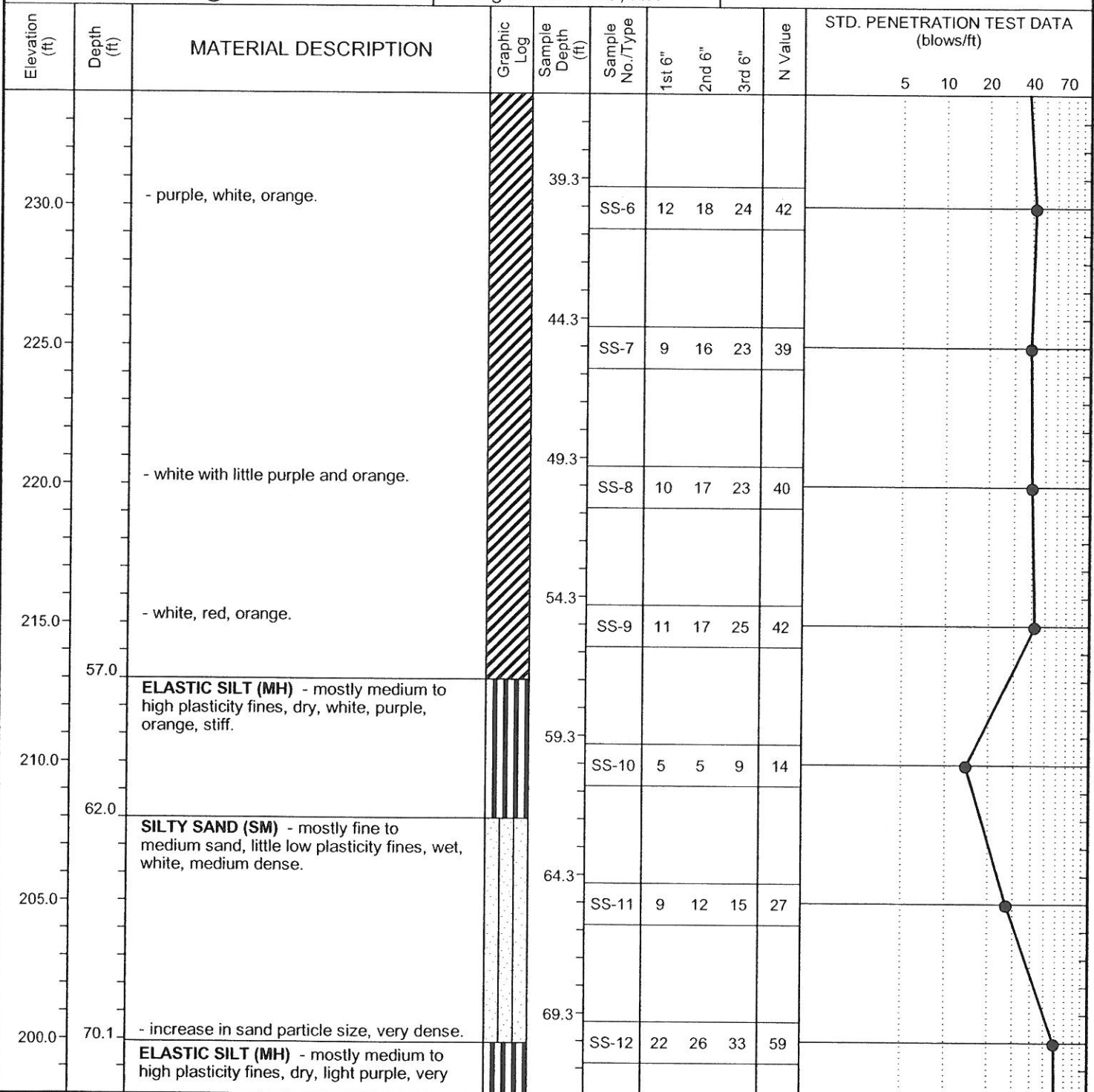
Ground Elevation: 270.0

Hammer Type: ☐ Gravity ☒ Automatic ☐ Other:

Water Level: 14.6 ft. @ TOB.

Drilling Method: DC, RW

Notes:

**Final Boring Log (05/05/05).** BK-51  
Drill Rig. Driving casing 0-28.4 ft. Mud rotary with drag bit 28.4-90.8 ft. Artesian pressure encountered.

## LEGEND

Continued Next Page

SAMPLER TYPE  
SS - Split Spoon  
ST - Shelby Tube  
AWG - Rock Core, 1-1/8"

NQ - Rock Core, 1-7/8"  
CU - Cuttings  
CT - Continuous Tube

DRILLING METHOD  
HSA - Hollow Stem Auger  
CFA - Continuous Flight Augers  
DC - Driving Casing

RW - Rotary Wash  
RC - Rock Core



RBO South Fork Edisto River and Cedar Creek Aiken County, South Carolina File #: 2.127B.01, PIN#: 26432, S&ME #: 1611-04-386					LOG OF BORING No. B-8											
Date Drilled: 02/10/05			Supervisor: TH		Notes: <b>Final Boring Log (05/05/05).</b> BK-51 Drill Rig. Driving casing 0-28.4 ft. Mud rotary with drag bit 28.4-90.8 ft. Artesian pressure encountered.											
Casing Length: 28.4 ft.			Ground Elevation: 270.0													
Hammer Type: <input type="checkbox"/> Gravity <input checked="" type="checkbox"/> Automatic <input type="checkbox"/> Other:																
Water Level: 14.6 ft. @ TOB.			Drilling Method: DC, RW													
Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"    2nd 6"    3rd 6"			N Value	STD. PENETRATION TEST DATA (blows/ft)						
						1st 6"	2nd 6"	3rd 6"		5	10	20	40	70		
195.0    190.0    185.0    180.0	77.0    90.8	hard.		74.3												
		- tan.		SS-13	16	27	33	60								
		<b>SILTY SAND (SM)</b> - mostly fine to medium sand, some low to medium plasticity fines, moist, white and purple, medium dense.		79.3												
		SS-14		11	12	12	24									
		84.3														
SS-15	10	11	14	25												
89.3																
SS-16	26	29	30	59												
		- decrease in fines, white, very dense.														
		Boring Terminated at 90.8 feet.														
175.0																
170.0																
165.0																

**LEGEND**

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
ST - Shelby Tube	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

**RBO South Fork Edisto River and Cedar Creek****Aiken County, South Carolina****File #: 2.127B.01, PIN#: 26432, S&ME #: 1611-04-386****LOG OF BORING No. B-9**

Station:

518+35

Offset:

38.5 ft. L of C/L

Date Drilled: 02/02/05

Supervisor: TH

Casing Length: 23.8 ft.

Ground Elevation: 270.0

Hammer Type: ☐ Gravity ☒ Automatic ☐ Other:

Water Level: 14 ft. @ 24 hrs.

Drilling Method: DC, RW

Notes:

**Final Boring Log (05/05/05).** BK-51  
Drill Rig. Driving casing 0-23.8 ft. Mud  
rotary with drag bit 23.8-95.3 ft. Artesian  
pressure encountered.

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	N Value	STD. PENETRATION TEST DATA (blows/ft)				
	0.0	Top of existing bridge deck.								5	10	20	40	70
	0.1	ASPHALT - approximately 1 inch of asphalt.												
	0.8	CONCRETE - approximately 8 inches of concrete.												
265.0														
260.0		15.5 feet from top of bridge deck to existing ground surface.												
255.0	15.5	Mud line.		15.5	SS-1	WOH			WOH					
	18.0	SANDY LEAN CLAY (CL) - mostly low to medium plasticity fines, some fine sand, wet, gray, very soft.		18.1										
250.0		POORLY GRADED SAND (SP) - mostly fine sand, piece of wood, organic odor, wet, tan, loose.			SS-2	1	2	3	5					
245.0	22.0	SILTY SAND (SM) - mostly fine to medium sand, some medium plasticity fines, dry to moist, white, medium dense.		23.8	SS-3	6	8	13	21					
240.0		- white and purple.		28.8	SS-4	15	14	15	29					
235.0	32.0	FAT CLAY WITH SAND (CH) - mostly medium to high plasticity fines, few fine to medium sands, moist, white, red, orange, hard.		33.8	SS-5	6	12	19	31					

**LEGEND***Continued Next Page*

SAMPLER TYPE  
SS - Split Spoon  
ST - Shelby Tube  
AWG - Rock Core, 1-1/8"  
NQ - Rock Core, 1-7/8"  
CU - Cuttings  
CT - Continuous Tube

DRILLING METHOD  
HSA - Hollow Stem Auger  
CFA - Continuous Flight Augers  
DC - Driving Casing  
RW - Rotary Wash  
RC - Rock Core



RBO South Fork Edisto River and Cedar Creek

Aiken County, South Carolina

File #: 2.127B.01, PIN#: 26432, S&amp;ME #: 1611-04-386

## LOG OF BORING No. B-9

Station:

518+35

Offset:

38.5 ft. L of C/L

Date Drilled: 02/02/05

Supervisor: TH

Casing Length: 23.8 ft.

Ground Elevation: 270.0

Hammer Type: ☐ Gravity ☒ Automatic ☐ Other:

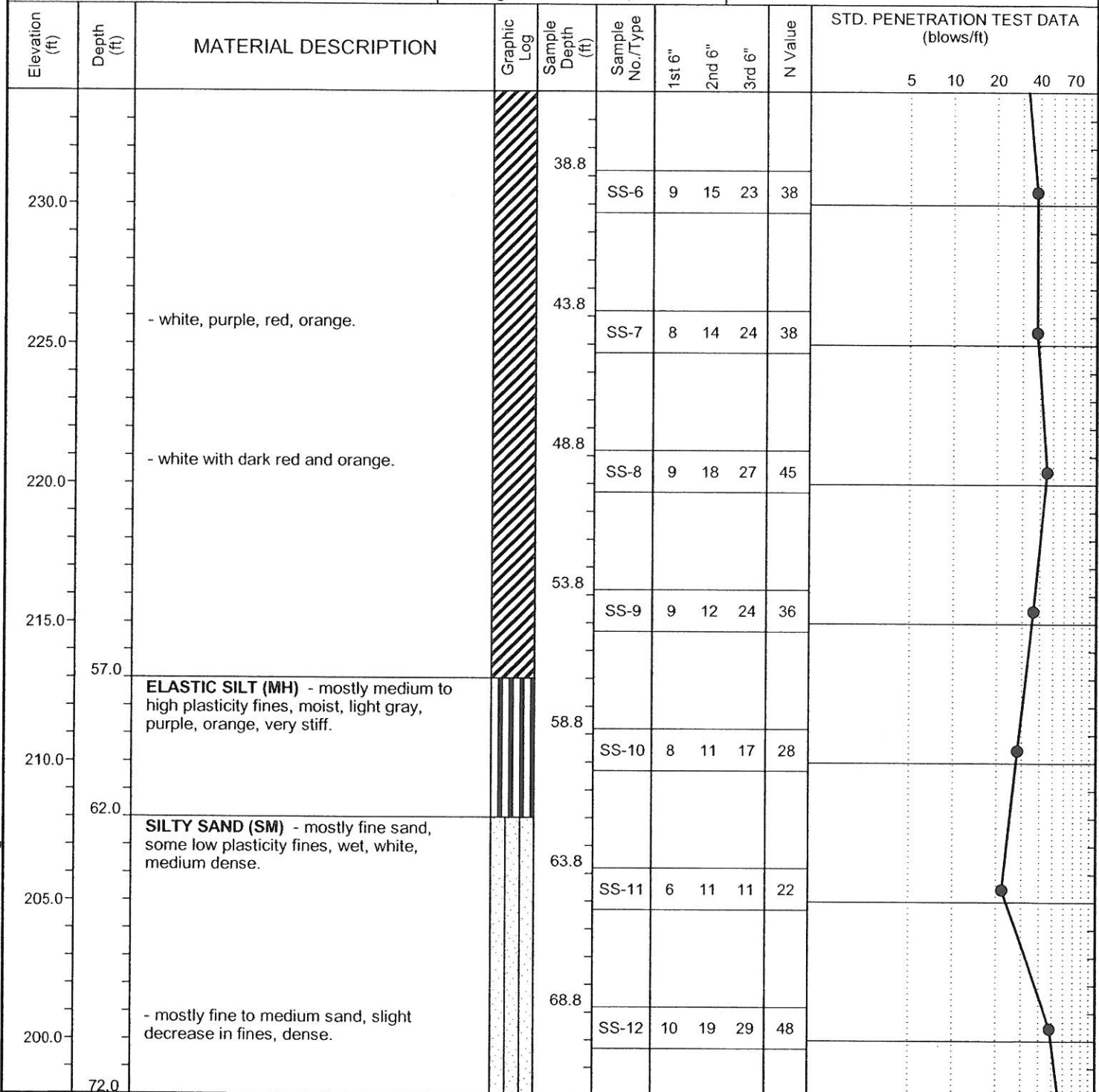
Water Level: 14 ft. @ 24 hrs.

Drilling Method: DC, RW

Notes:

**Final Boring Log (05/05/05). BK-51**

Drill Rig. Driving casing 0-23.8 ft. Mud rotary with drag bit 23.8-95.3 ft. Artesian pressure encountered.



## LEGEND

Continued Next Page

SAMPLER TYPE  
SS - Split Spoon  
ST - Shelby Tube  
AWG - Rock Core, 1-1/8"  
NQ - Rock Core, 1-7/8"  
CU - Cuttings  
CT - Continuous Tube

DRILLING METHOD  
HSA - Hollow Stem Auger  
CFA - Continuous Flight Augers  
DC - Driving Casing  
RW - Rotary Wash  
RC - Rock Core



RBO South Fork Edisto River and Cedar Creek

Aiken County, South Carolina

File #: 2.127B.01, PIN#: 26432, S&amp;ME #: 1611-04-386

## LOG OF BORING No. B-9

Station:

518+35

Offset:

38.5 ft. L of C/L

Date Drilled: 02/02/05

Supervisor: TH

Casing Length: 23.8 ft.

Ground Elevation: 270.0

Hammer Type: ☐ Gravity ☒ Automatic ☐ Other:

Water Level: 14 ft. @ 24 hrs.

Drilling Method: DC, RW

Notes:

**Final Boring Log (05/05/05).** BK-51

Drill Rig. Driving casing 0-23.8 ft. Mud rotary with drag bit 23.8-95.3 ft. Artesian pressure encountered.

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	N Value	STD. PENETRATION TEST DATA (blows/ft)				
										5	10	20	40	70
195.0	73.8	ELASTIC SILT WITH SAND (MH) - mostly medium to high plasticity fines, few fine sands, dry to moist, white, very hard.		73.8	SS-13	10	20	45	65					
190.0	77.0	SANDY ELASTIC SILT (MH) - mostly medium to high plasticity fines, some fine sand, dry to moist, white and purple, hard.		78.8	SS-14	15	22	24	46					
185.0	82.0	SILTY SAND (SM) - mostly fine sand, some low to medium plasticity fines, wet, white, medium dense.		83.8	SS-15	9	10	11	21					
180.0		- mostly fine to coarse sand.		88.8	SS-16	6	10	15	25					
175.0	95.3	- mostly fine to medium sand.		93.8	SS-17	8	10	17	27					
		Boring Terminated at 95.3 feet.												

## LEGEND

SS - Split Spoon  
ST - Shelby Tube  
AWG - Rock Core, 1-1/8"

## SAMPLER TYPE

NQ - Rock Core, 1-7/8"  
CU - Cuttings  
CT - Continuous Tube

## DRILLING METHOD

HSA - Hollow Stem Auger  
CFA - Continuous Flight Augers  
DC - Driving Casing  
RW - Rotary Wash  
RC - Rock Core



**RBO South Fork Edisto River and Cedar Creek****Aiken County, South Carolina****File #: 2.127B.01, PIN#: 26432, S&ME #: 1611-04-386****LOG OF BORING No. B-10**

Station:

518+62

Offset:

39 ft. L of C/L

Date Drilled: 02/08/05

Supervisor: TH

Casing Length: 25.4 ft.

Ground Elevation: 270.0

Hammer Type: ☐ Gravity ☒ Automatic ☐ Other:

Water Level: 14.5 ft. @ 24 hrs.

Drilling Method: DC, RW

Notes:

**Final Boring Log (05/05/05).** BK-51  
Drill Rig. Driving casing 0-25.4 ft. Mud  
rotary with drag bit 25.4-92.2 ft. Artesian  
pressure encountered.

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" 2nd 6" 3rd 6"			N Value	STD. PENETRATION TEST DATA (blows/ft)				
										5	10	20	40	70
	0.0	Top of existing bridge deck.												
	0.1	ASPHALT - approximately 1 inch of asphalt.												
	0.8	CONCRETE - approximately 8 inches of concrete.												
265.0														
260.0		15.1 feet from top of bridge deck to existing ground surface.												
255.0	15.1	Mud line.		15.1	SS-1	WOH			WOH					
250.0	20.0	CLAYEY SAND (SC) - mostly fine sand, some low to medium plasticity fines, few organics, moist to wet, light brown to gray, very loose.												
				19.9	SS-2	4 5 6			11					
245.0	24.0	POORLY GRADED SAND (SP) - mostly fine to medium sand, wet, light tan, medium dense.												
				24.9	SS-3	11 17 20			37					
240.0	31.0	SILTY SAND (SM) - mostly fine to medium sand, some medium to high plasticity fines, moist, white, dense.												
				30.7	SS-4	7 11 15			26					
235.0	34.0	CLAYEY SAND (SC) - mostly fine to medium sand, some low to medium plasticity fines, moist, white and purple, medium dense.												
				35.7										
	34.0	FAT CLAY (CH) - mostly medium to high plasticity fines, moist, white, hard to very hard.												

**LEGEND***Continued Next Page*

SAMPLER TYPE  
SS - Split Spoon  
ST - Shelby Tube  
AWG - Rock Core, 1-1/8"  
NQ - Rock Core, 1-7/8"  
CU - Cuttings  
CT - Continuous Tube

DRILLING METHOD  
HSA - Hollow Stem Auger  
CFA - Continuous Flight Augers  
DC - Driving Casing  
RW - Rotary Wash  
RC - Rock Core





RBO South Fork Edisto River and Cedar Creek

Aiken County, South Carolina

File #: 2.127B.01, PIN#: 26432, S&amp;ME #: 1611-04-386

## LOG OF BORING No. B-10

Station:

518+62

Offset:

39 ft. L of C/L

Date Drilled: 02/08/05

Supervisor: TH

Casing Length: 25.4 ft.

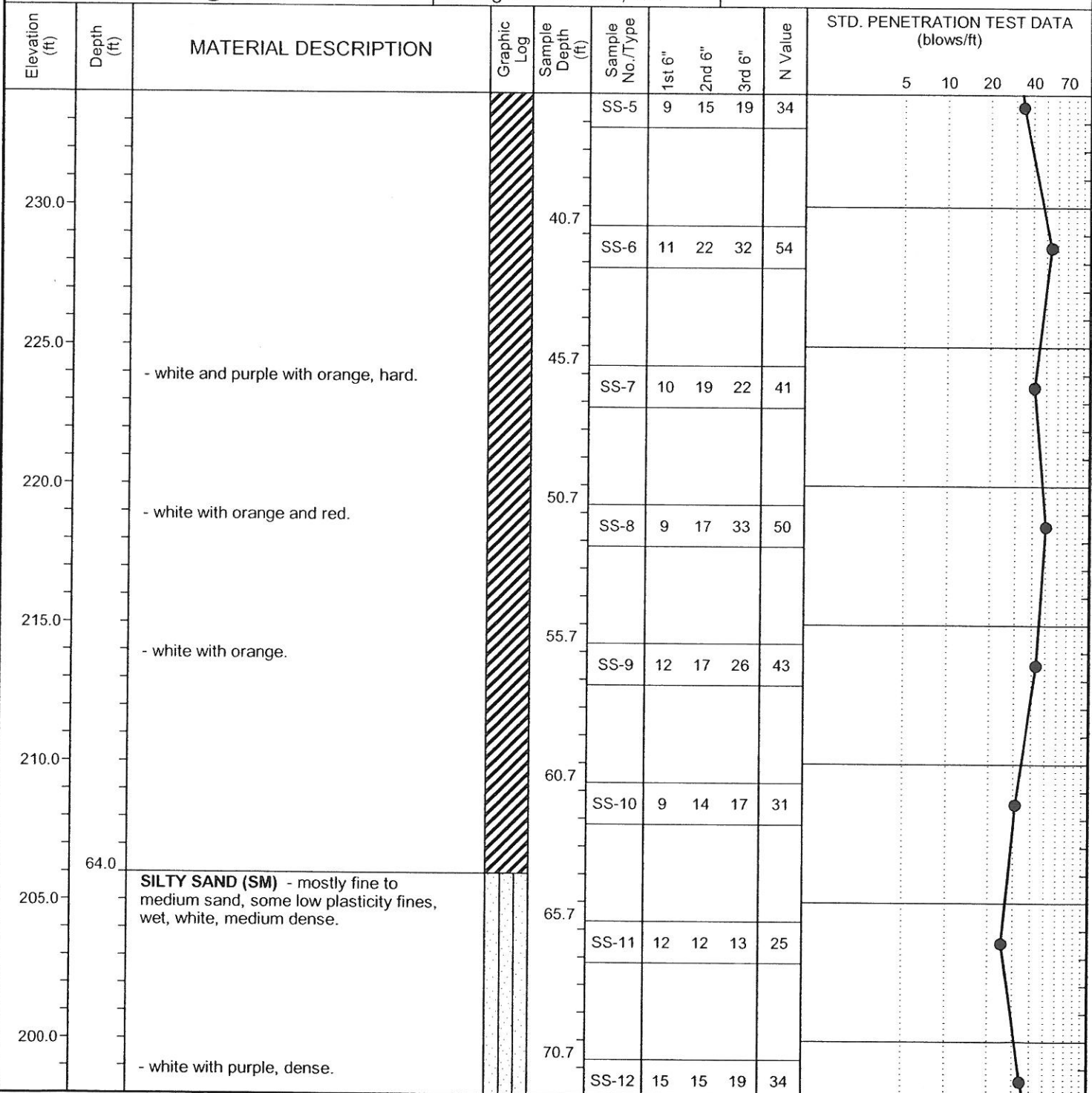
Ground Elevation: 270.0

Hammer Type: ☐ Gravity ☒ Automatic ☐ Other:

Water Level: 14.5 ft. @ 24 hrs.

Drilling Method: DC, RW

Notes:

**Final Boring Log (05/05/05).** BK-51  
Drill Rig. Driving casing 0-25.4 ft. Mud  
rotary with drag bit 25.4-92.2 ft. Artesian  
pressure encountered.

## LEGEND

Continued Next Page

SAMPLER TYPE  
SS - Split Spoon NQ - Rock Core, 1-7/8"  
ST - Shelby Tube CU - Cuttings  
AWG - Rock Core, 1-1/8" CT - Continuous Tube

DRILLING METHOD  
HSA - Hollow Stem Auger RW - Rotary Wash  
CFA - Continuous Flight Augers RC - Rock Core  
DC - Driving Casing



RBO South Fork Edisto River and Cedar Creek

Aiken County, South Carolina

File #: 2.127B.01, PIN#: 26432, S&amp;ME #: 1611-04-386

## LOG OF BORING No. B-10

Station:

518+62

Offset:

39 ft. L of C/L

Date Drilled: 02/08/05

Supervisor: TH

Casing Length: 25.4 ft.

Ground Elevation: 270.0

Hammer Type: ☐ Gravity ☒ Automatic ☐ Other:

Notes:

**Final Boring Log (05/05/05).** BK-51  
Drill Rig. Driving casing 0-25.4 ft. Mud  
rotary with drag bit 25.4-92.2 ft. Artesian  
pressure encountered.

Water Level: 14.5 ft. @ 24 hrs.

Drilling Method: DC, RW

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" 2nd 6" 3rd 6"			N Value	STD. PENETRATION TEST DATA (blows/ft)				
						5	10	20		40	70			
195.0	74.0	ELASTIC SILT (MH) - mostly medium to high plasticity fines, trace fine sands, moist, light tan to white, very hard.  - white and purple.		75.7	SS-13	11	23	31	54					
190.0				80.7	SS-14	12	22	31	53					
185.0	84.0			SILTY SAND (SM) - mostly fine sand, some low plasticity fines, moist to wet, white with brown, medium dense.  - white with tan, dense.		85.7	SS-15	6	12	15	27			
180.0		90.7	SS-16			9	19	21	40					
175.0	92.2	Boring Terminated at 92.2 feet.												
170.0														
165.0														

## LEGEND

## SAMPLER TYPE

SS - Split Spoon  
ST - Shelby Tube  
AWG - Rock Core, 1-1/8"

NQ - Rock Core, 1-7/8"  
CU - Cuttings  
CT - Continuous Tube

## DRILLING METHOD

HSA - Hollow Stem Auger  
CFA - Continuous Flight Augers  
DC - Driving Casing

RW - Rotary Wash  
RC - Rock Core



## RBO South Fork Edisto River and Cedar Creek

Aiken County, South Carolina

File #: 2.127B.01, PIN#: 26432, S&amp;ME #: 1611-04-386

## LOG OF BORING No. B-11

Station:

518+92

Offset:

39 ft. L of C/L

Date Drilled: 03/01/05

Supervisor: TH

Notes:

**Final Boring Log (05/05/05).** Mobile B-57 Drill Rig. Driving casing 0-25 ft. Mud rotary with drag bit 25-95.5 ft. Artesian pressure encountered.

Casing Length: 25 ft.

Ground Elevation: 270.0

Hammer Type: ☒ Gravity ☐ Automatic ☐ Other:

Water Level: 13.5 ft. @ TOB.

Drilling Method: DC, RW

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	N Value	STD. PENETRATION TEST DATA (blows/ft)				
	0.0	Top of existing bridge deck.								5	10	20	40	70
	0.1	ASPHALT - approximately 1 inch of asphalt.												
	0.8	CONCRETE - approximately 8 inches of concrete.												
265.0														
		15 feet from top of bridge deck to existing ground surface.												
260.0														
255.0	15.0	Mud line.		15.0										
		POORLY GRADED SAND (SP) - mostly fine sand, trace fines, pieces of wood, wet, tan with brown, medium dense.			SS-1	3	6	8	14					
250.0	18.0	LEAN CLAY (CL) - mostly low to medium plasticity fines, organic odor, wet, dark gray, stiff.		19.0										
	20.0	POORLY GRADED SAND (SP) - mostly fine to medium sand, trace fines, wet, tan, medium dense.			SS-2	6	3	7	10					
	22.0	SILTY SAND (SM) - mostly fine to medium sand, some medium plasticity fines, moist, white, dense to very dense.												
245.0				24.0	SS-3	17	22	30	52					
240.0				29.0	SS-4	20	22	24	46					
235.0	34.5	FAT CLAY (CH) - mostly medium to high plasticity fines, dry to moist, white, red,		34.0	SS-5	15	30	37	67					

## LEGEND

Continued Next Page

SAMPLER TYPE  
SS - Split Spoon  
ST - Shelby Tube  
AWG - Rock Core, 1-1/8"  
NQ - Rock Core, 1-7/8"  
CU - Cuttings  
CT - Continuous Tube

DRILLING METHOD  
HSA - Hollow Stem Auger  
CFA - Continuous Flight Augers  
DC - Driving Casing  
RW - Rotary Wash  
RC - Rock Core



RBO South Fork Edisto River and Cedar Creek

Aiken County, South Carolina

File #: 2.127B.01, PIN#: 26432, S&amp;ME #: 1611-04-386

## LOG OF BORING No. B-11

Station:

518+92

Offset:

39 ft. L of C/L

Date Drilled: 03/01/05

Supervisor: TH

Casing Length: 25 ft.

Ground Elevation: 270.0

Hammer Type: ☒ Gravity ☐ Automatic ☐ Other:

Water Level: 13.5 ft. @ TOB.

Drilling Method: DC, RW

Notes:

**Final Boring Log (05/05/05).** Mobile B-57 Drill Rig. Driving casing 0-25 ft. Mud rotary with drag bit 25-95.5 ft. Artesian pressure encountered.

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"			N Value	STD. PENETRATION TEST DATA (blows/ft)				
						1st 6"	2nd 6"	3rd 6"		5	10	20	40	70
		orange, very hard.												
230.0		- pink with red and white.		39.0	SS-6	17	31	33	64					
225.0		- white and purple.		44.0	SS-7	18	31	35	66					
220.0		- trace fine sands, white and red.		49.0	SS-8	14	26	42	68					
215.0		- white.		54.0	SS-9	17	27	37	64					
210.0		- no recovery, likely same as above.		59.0	SS-10	16	23	24	47					
205.0		<b>SILTY SAND (SM)</b> - mostly fine to medium sand, little low plasticity fines, wet, white with purple, dense.		64.0	SS-11	6	14	22	36					
200.0		- white.		69.0	SS-12	11	19	27	46					
72.0														

## LEGEND

Continued Next Page

SAMPLER TYPE  
SS - Split Spoon  
ST - Shelby Tube  
AWG - Rock Core, 1-1/8"  
NQ - Rock Core, 1-7/8"  
CU - Cuttings  
CT - Continuous Tube

DRILLING METHOD  
HSA - Hollow Stem Auger  
CFA - Continuous Flight Augers  
DC - Driving Casing  
RW - Rotary Wash  
RC - Rock Core



RBO South Fork Edisto River and Cedar Creek

Aiken County, South Carolina

File #: 2.127B.01, PIN#: 26432, S&ME #: 1611-04-386

## LOG OF BORING No. B-11

Station:

518+92

Offset:

39 ft. L of C/L

Date Drilled: 03/01/05

Supervisor: TH

Notes:

**Final Boring Log (05/05/05).** Mobile B-57 Drill Rig. Driving casing 0-25 ft. Mud rotary with drag bit 25-95.5 ft. Artesian pressure encountered.

Casing Length: 25 ft.

Ground Elevation: 270.0

Hammer Type: ☒ Gravity ☐ Automatic ☐ Other:

Water Level: 13.5 ft. @ TOB.

Drilling Method: DC, RW

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" 2nd 6" 3rd 6"			N Value	STD. PENETRATION TEST DATA (blows/ft)				
										5	10	20	40	70
195.0		<b>ELASTIC SILT WITH SAND (MH)</b> - mostly medium to high plasticity fines, few fine sands, dry to moist, light pink, very hard.		74.0	SS-13	23	50/5"		50/5"					
190.0		- white.		79.0	SS-14	32	50/5"		50/5"					
185.0	82.0	<b>SILTY SAND (SM)</b> - mostly fine sand, some low plasticity fines, wet, gray, dense.		84.0	SS-15	21	20	20	40					
180.0		- mostly fine to medium sand, white, purple, light orange, very dense.		89.0	SS-16	14	25	26	51					
175.0	95.5	- mostly fine sand, increase in fines, white, dense.		94.0	SS-17	14	16	19	35					
		Boring Terminated at 95.5 feet.												
170.0														
165.0														

### LEGEND

SAMPLER TYPE			DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"		HSA - Hollow Stem Auger	RW - Rotary Wash
ST - Shelby Tube	CU - Cuttings		CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube		DC - Driving Casing	



**RBO South Fork Edisto River and Cedar Creek****Aiken County, South Carolina****File #: 2.127B.01, PIN#: 26432, S&ME #: 1611-04-386****LOG OF BORING No. B-12**

Station:

519+22

Offset:

37.5 ft. L of C/L

Date Drilled: 02/02/05

Supervisor: TH

Notes:

**Final Boring Log (05/05/05).** Mobile B-57 Drill Rig. Driving casing 0-25 ft. Mud rotary with drag bit 25-91.5 ft. Artesian pressure encountered.

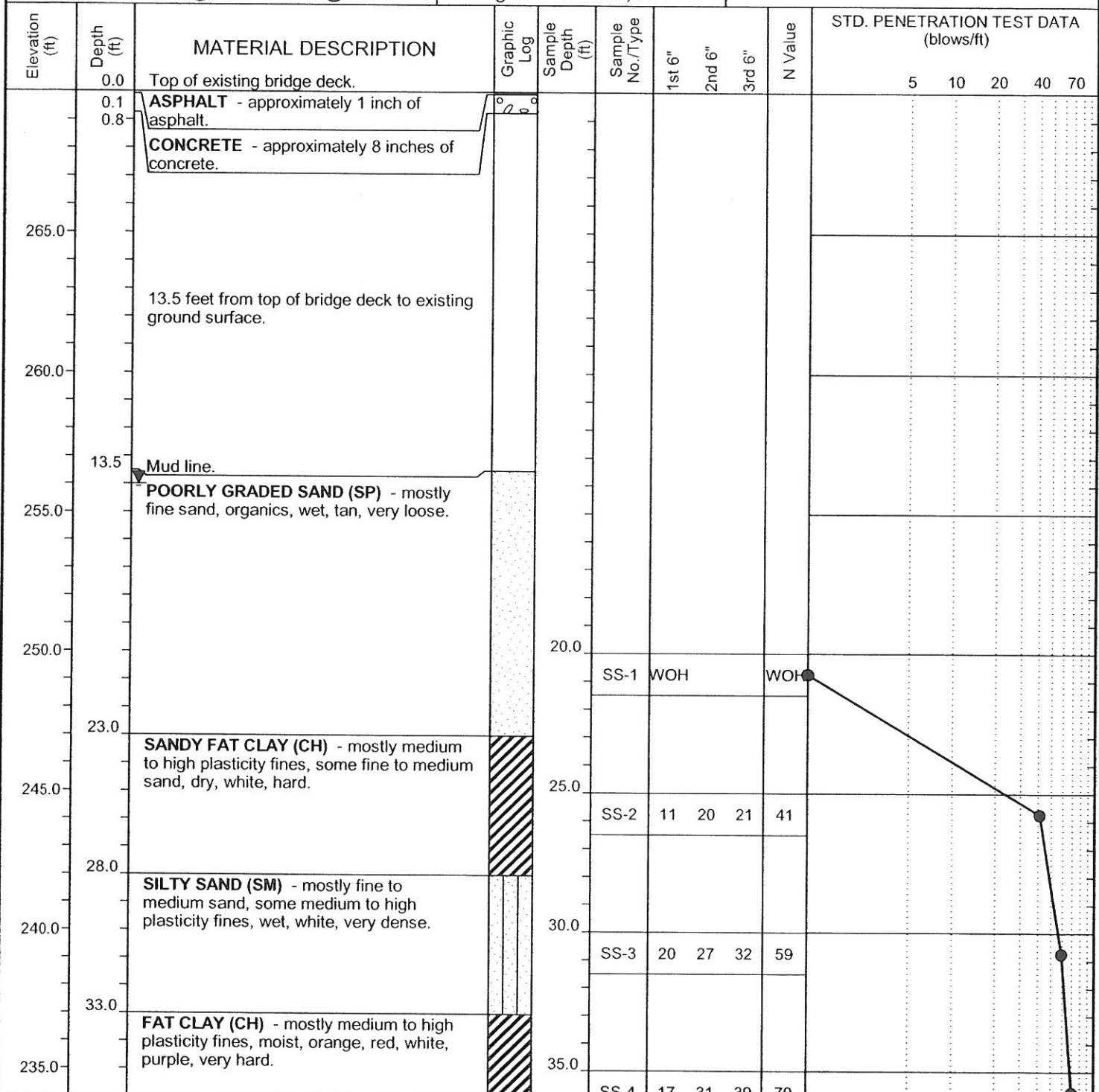
Casing Length: 25 ft.

Ground Elevation: 270.0

Hammer Type: ☒ Gravity ☐ Automatic ☐ Other:

Water Level: 14 ft. @ TOB. 14 ft. @ 24 hrs.

Drilling Method: DC, RW

**LEGEND***Continued Next Page*

**SAMPLER TYPE**  
SS - Split Spoon  
ST - Shelby Tube  
AWG - Rock Core, 1-1/8"  
NQ - Rock Core, 1-7/8"  
CU - Cuttings  
CT - Continuous Tube

**DRILLING METHOD**  
HSA - Hollow Stem Auger  
CFA - Continuous Flight Augers  
DC - Driving Casing  
RW - Rotary Wash  
RC - Rock Core



RBO South Fork Edisto River and Cedar Creek

Aiken County, South Carolina

File #: 2.127B.01, PIN#: 26432, S&ME #: 1611-04-386

## LOG OF BORING No. B-12

Station:

519+22

Offset:

37.5 ft. L of C/L

Date Drilled: 02/02/05

Supervisor: TH

Casing Length: 25 ft.

Ground Elevation: 270.0

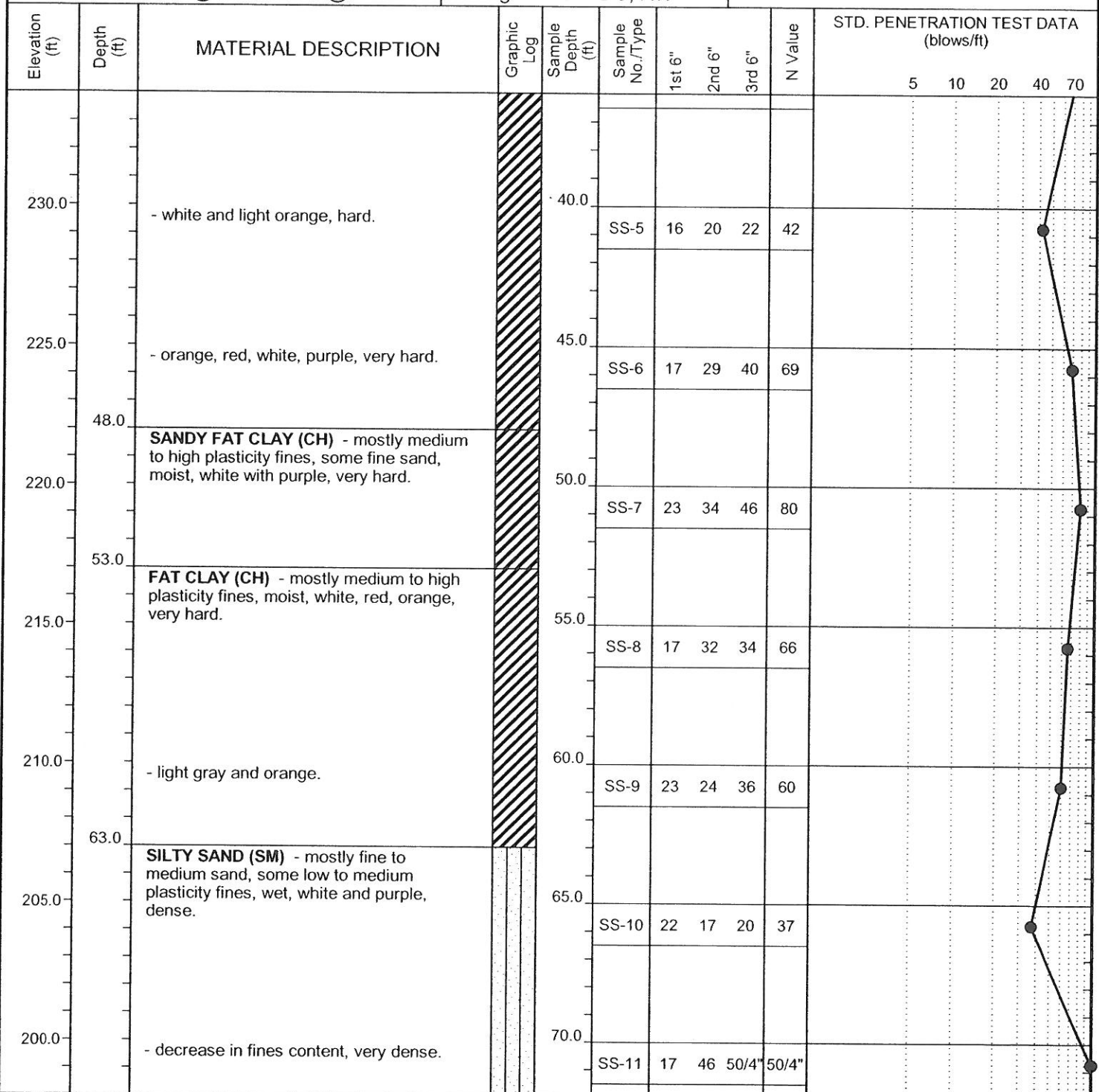
Hammer Type: ☒ Gravity ☐ Automatic ☐ Other:

Water Level: 14 ft. @ TOB. 14 ft. @ 24 hrs.

Drilling Method: DC, RW

Notes:

**Final Boring Log (05/05/05).** Mobile B-57 Drill Rig. Driving casing 0-25 ft. Mud rotary with drag bit 25-91.5 ft. Artesian pressure encountered.



### LEGEND

Continued Next Page

**SAMPLER TYPE**  
 SS - Split Spoon  
 ST - Shelby Tube  
 AWG - Rock Core, 1-1/8"  
 NQ - Rock Core, 1-7/8"  
 CU - Cuttings  
 CT - Continuous Tube

**DRILLING METHOD**  
 HSA - Hollow Stem Auger  
 CFA - Continuous Flight Augers  
 DC - Driving Casing  
 RW - Rotary Wash  
 RC - Rock Core



RBO South Fork Edisto River and Cedar Creek

Aiken County, South Carolina

File #: 2.127B.01, PIN#: 26432, S&ME #: 1611-04-386

## LOG OF BORING No. B-12

Station:

519+22

Offset:

37.5 ft. L of C/L

Date Drilled: 02/02/05

Supervisor: TH

Notes:

**Final Boring Log (05/05/05).** Mobile B-57 Drill Rig. Driving casing 0-25 ft. Mud rotary with drag bit 25-91.5 ft. Artesian pressure encountered.

Casing Length: 25 ft.

Ground Elevation: 270.0

Hammer Type: ☒ Gravity ☐ Automatic ☐ Other:

Water Level: 14 ft. @ TOB. 14 ft. @ 24 hrs.

Drilling Method: DC, RW

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" 2nd 6" 3rd 6"			N Value	STD. PENETRATION TEST DATA (blows/ft)				
										5	10	20	40	70
73.0		<b>ELASTIC SILT (MH)</b> - mostly medium to high plasticity fines, trace fine sands, moist, light pink, very hard.												
195.0				75.0	SS-12	40	50/3"	50/3"						
190.0		- tan.		80.0	SS-13	46	50/3"	50/3"						
83.0		<b>SILTY SAND (SM)</b> - mostly fine sand, some low to medium plasticity fines, wet, white, purple, dark orange, very dense.												
185.0				85.0	SS-14	36	50/4"	50/4"						
180.0		- increase in fines content.		90.0	SS-15	20	36	50/4"	50/4"					
91.5		Boring Terminated at 91.5 feet.												
175.0														
170.0														
165.0														

### LEGEND

**SAMPLER TYPE**  
 SS - Split Spoon  
 ST - Shelby Tube  
 AWG - Rock Core, 1-1/8"  
 NQ - Rock Core, 1-7/8"  
 CU - Cuttings  
 CT - Continuous Tube

**DRILLING METHOD**  
 HSA - Hollow Stem Auger  
 CFA - Continuous Flight Augers  
 DC - Driving Casing  
 RW - Rotary Wash  
 RC - Rock Core



RBO South Fork Edisto River and Cedar Creek

Aiken County, South Carolina

File #: 2.127B.01, PIN#: 26432, S&amp;ME #: 1611-04-386

## LOG OF BORING No. B-13

Station:

519+52

Offset:

38.5 ft. L of C/L

Date Drilled: 02/15/05

Supervisor: TH

Casing Length: 30 ft.

Ground Elevation: 270.0

Hammer Type: ☒ Gravity ☐ Automatic ☐ Other:

Water Level: 14.5 ft. @ TOB.

Drilling Method: DC, RW

Notes:

**Final Boring Log (05/05/05).** Mobile B-57 Drill Rig. Driving casing 0-30 ft. Mud rotary with drag bit 30-89.5 ft. Artesian pressure encountered.

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	N Value	STD. PENETRATION TEST DATA (blows/ft)				
	0.0	Top of existing bridge deck.								5	10	20	40	70
	0.1	ASPHALT - approximately 1 inch of asphalt.												
	0.8	CONCRETE - approximately 8 inches of concrete.												
265.0														
260.0		14.5 feet from top of bridge deck to existing ground surface.												
255.0	14.5	Mud line.		15.0	SS-1	2	2	2	4					
	17.0	SILTY SAND (SM) - mostly fine sand, some low plasticity fines, wet, brown, very loose.												
250.0		POORLY GRADED SAND (SP) - mostly fine to medium sand, wet, tan, loose.		18.0	SS-2	5	4	5	9					
245.0	22.0	SANDY FAT CLAY (CH) - mostly medium to high plasticity fines, some fine sand, moist, white, very hard.		23.0	SS-3	18	26	49	75					
240.0		- increase in sand content, hard.		28.0	SS-4	15	17	33	50					
235.0	32.0	FAT CLAY (CH) - mostly medium to high plasticity fines, dry to moist, white, very hard.		33.0	SS-5	16	20	35	55					

## LEGEND

Continued Next Page

SAMPLER TYPE  
SS - Split Spoon  
ST - Shelby Tube  
AWG - Rock Core, 1-1/8"  
NQ - Rock Core, 1-7/8"  
CU - Cuttings  
CT - Continuous Tube

DRILLING METHOD  
HSA - Hollow Stem Auger  
CFA - Continuous Flight Augers  
DC - Driving Casing  
RW - Rotary Wash  
RC - Rock Core

**RBO South Fork Edisto River and Cedar Creek****Aiken County, South Carolina****File #: 2.127B.01, PIN#: 26432, S&ME #: 1611-04-386****LOG OF BORING No. B-13**

Station:

519+52

Offset:

38.5 ft. L of C/L

Date Drilled: 02/15/05

Supervisor: TH

Casing Length: 30 ft.

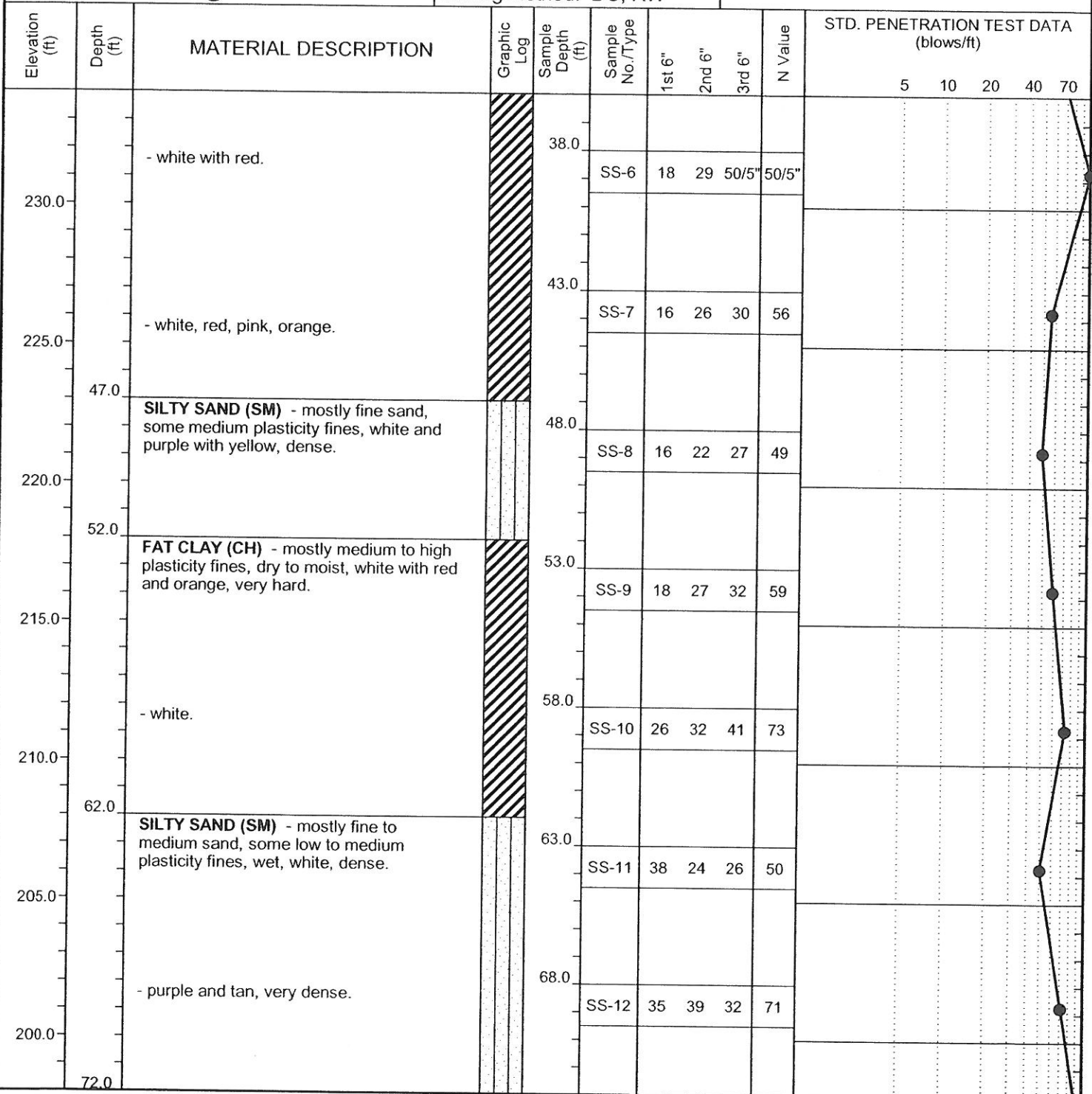
Ground Elevation: 270.0

Hammer Type: ☒ Gravity ☐ Automatic ☐ Other:

Water Level: 14.5 ft. @ TOB.

Drilling Method: DC, RW

Notes:

**Final Boring Log (05/05/05).** Mobile B-57 Drill Rig. Driving casing 0-30 ft. Mud rotary with drag bit 30-89.5 ft. Artesian pressure encountered.**LEGEND***Continued Next Page*

**SAMPLER TYPE**  
SS - Split Spoon  
ST - Shelby Tube  
AWG - Rock Core, 1-1/8"  
NQ - Rock Core, 1-7/8"  
CU - Cuttings  
CT - Continuous Tube

**DRILLING METHOD**  
HSA - Hollow Stem Auger  
CFA - Continuous Flight Augers  
DC - Driving Casing  
RW - Rotary Wash  
RC - Rock Core





RBO South Fork Edisto River and Cedar Creek

Aiken County, South Carolina

File #: 2.127B.01, PIN#: 26432, S&amp;ME #: 1611-04-386

## LOG OF BORING No. B-13

Station:

519+52

Offset:

38.5 ft. L of C/L

Date Drilled: 02/15/05

Supervisor: TH

Casing Length: 30 ft.

Ground Elevation: 270.0

Hammer Type: ☒ Gravity ☐ Automatic ☐ Other:

Notes:

**Final Boring Log (05/05/05).** Mobile B-57 Drill Rig. Driving casing 0-30 ft. Mud rotary with drag bit 30-89.5 ft. Artesian pressure encountered.

Water Level: 14.5 ft. @ TOB.

Drilling Method: DC, RW

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" 2nd 6" 3rd 6"			N Value	STD. PENETRATION TEST DATA (blows/ft)				
						1st 6"	2nd 6"	3rd 6"		5	10	20	40	70
195.0		<b>ELASTIC SILT (MH)</b> - mostly medium to high plasticity fines, moist, white, very hard.		73.0	SS-13	32	50/5"		50/5"					
		- tan.		78.0	SS-14	30	46	50/5"	50/5"					
185.0		<b>SILTY SAND (SM)</b> - mostly fine sand, little low plasticity fines, wet, purple and tan, very dense.		83.0	SS-15	16	36	50/5"	50/5"					
		- purple, white, orange, dense.		88.0	SS-16	13	15	23	38					
180.0	89.5	Boring Terminated at 89.5 feet.												

## LEGEND

SS - Split Spoon  
ST - Shelby Tube  
AWG - Rock Core, 1-1/8"

## SAMPLER TYPE

NQ - Rock Core, 1-7/8"  
CU - Cuttings  
CT - Continuous Tube

## DRILLING METHOD

HSA - Hollow Stem Auger  
CFA - Continuous Flight Augers  
DC - Driving Casing  
RW - Rotary Wash  
RC - Rock Core



RBO South Fork Edisto River and Cedar Creek

Aiken County, South Carolina

File #: 2.127B.01, PIN#: 26432, S&amp;ME #: 1611-04-386

## LOG OF BORING No. B-14

Station:

520+12

Offset:

39 ft. L of C/L

Date Drilled: 03/01/05

Supervisor: TH

Casing Length: 25.4 ft.

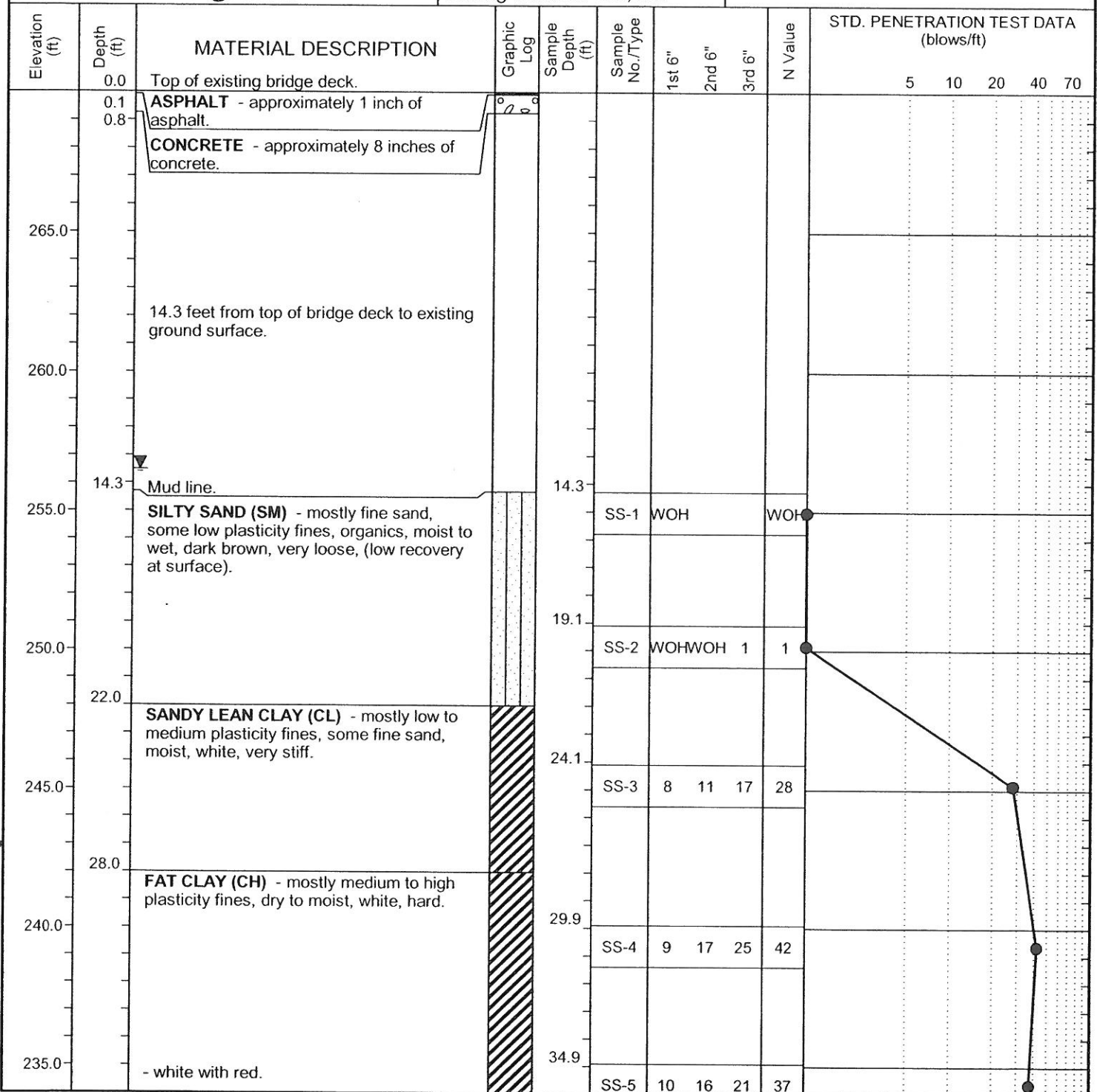
Ground Elevation: 270.0

Hammer Type: ☐ Gravity ☒ Automatic ☐ Other:

Water Level: 13.5 ft. @ 24 hrs.

Drilling Method: DC, RW

Notes:

**Final Boring Log (05/05/05).** BK-51  
Drill Rig. Driving casing 0-25.4 ft. Mud rotary with drag bit 25.4-93.4 ft. Artesian pressure encountered.

## LEGEND

Continued Next Page

SAMPLER TYPE  
SS - Split Spoon  
ST - Shelby Tube  
AWG - Rock Core, 1-1/8"

NQ - Rock Core, 1-7/8"  
CU - Cuttings  
CT - Continuous Tube

DRILLING METHOD  
HSA - Hollow Stem Auger  
CFA - Continuous Flight Augers  
DC - Driving Casing

RW - Rotary Wash  
RC - Rock Core



RBO South Fork Edisto River and Cedar Creek

Aiken County, South Carolina

File #: 2.127B.01, PIN#: 26432, S&ME #: 1611-04-386

## LOG OF BORING No. B-14

Station:

520+12

Offset:

39 ft. L of C/L

Date Drilled: 03/01/05

Supervisor: TH

Casing Length: 25.4 ft.

Ground Elevation: 270.0

Hammer Type: ☐ Gravity ☒ Automatic ☐ Other:

Water Level: 13.5 ft. @ 24 hrs.

Drilling Method: DC, RW

Notes:

**Final Boring Log (05/05/05).** BK-51  
Drill Rig. Driving casing 0-25.4 ft. Mud rotary with drag bit 25.4-93.4 ft. Artesian pressure encountered.

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" 2nd 6" 3rd 6"			N Value	STD. PENETRATION TEST DATA (blows/ft)				
										5	10	20	40	70
230.0		- purple, white, red, orange.		39.9										
					SS-6	11	20	27	47					
225.0		- white, purple, orange.		44.9										
					SS-7	11	20	30	50					
220.0		- white, red, orange, very hard to hard.		49.9										
					SS-8	13	20	34	54					
215.0				54.9										
					SS-9	9	16	24	40					
210.0		- white and brownish orange, hard.		59.9										
					SS-10	11	19	26	45					
63.0		<b>SILTY SAND (SM)</b> - mostly fine to medium sand, some low plasticity fines, wet, white, dense.		64.9										
205.0					SS-11	13	11	25	36					
68.0		<b>ELASTIC SILT WITH SAND (MH)</b> - mostly medium to high plasticity fines, few fine sands, dry to moist, tan, very hard.		69.9										
200.0					SS-12	13	29	38	67					

### LEGEND

Continued Next Page

**SAMPLER TYPE**  
 SS - Split Spoon  
 ST - Shelby Tube  
 AWG - Rock Core, 1-1/8"  
 NQ - Rock Core, 1-7/8"  
 CU - Cuttings  
 CT - Continuous Tube

**DRILLING METHOD**  
 HSA - Hollow Stem Auger  
 CFA - Continuous Flight Augers  
 DC - Driving Casing  
 RW - Rotary Wash  
 RC - Rock Core



RBO South Fork Edisto River and Cedar Creek

Aiken County, South Carolina

File #: 2.127B.01, PIN#: 26432, S&amp;ME #: 1611-04-386

## LOG OF BORING No. B-14

Station:

520+12

Offset:

39 ft. L of C/L

Date Drilled: 03/01/05

Supervisor: TH

Casing Length: 25.4 ft.

Ground Elevation: 270.0

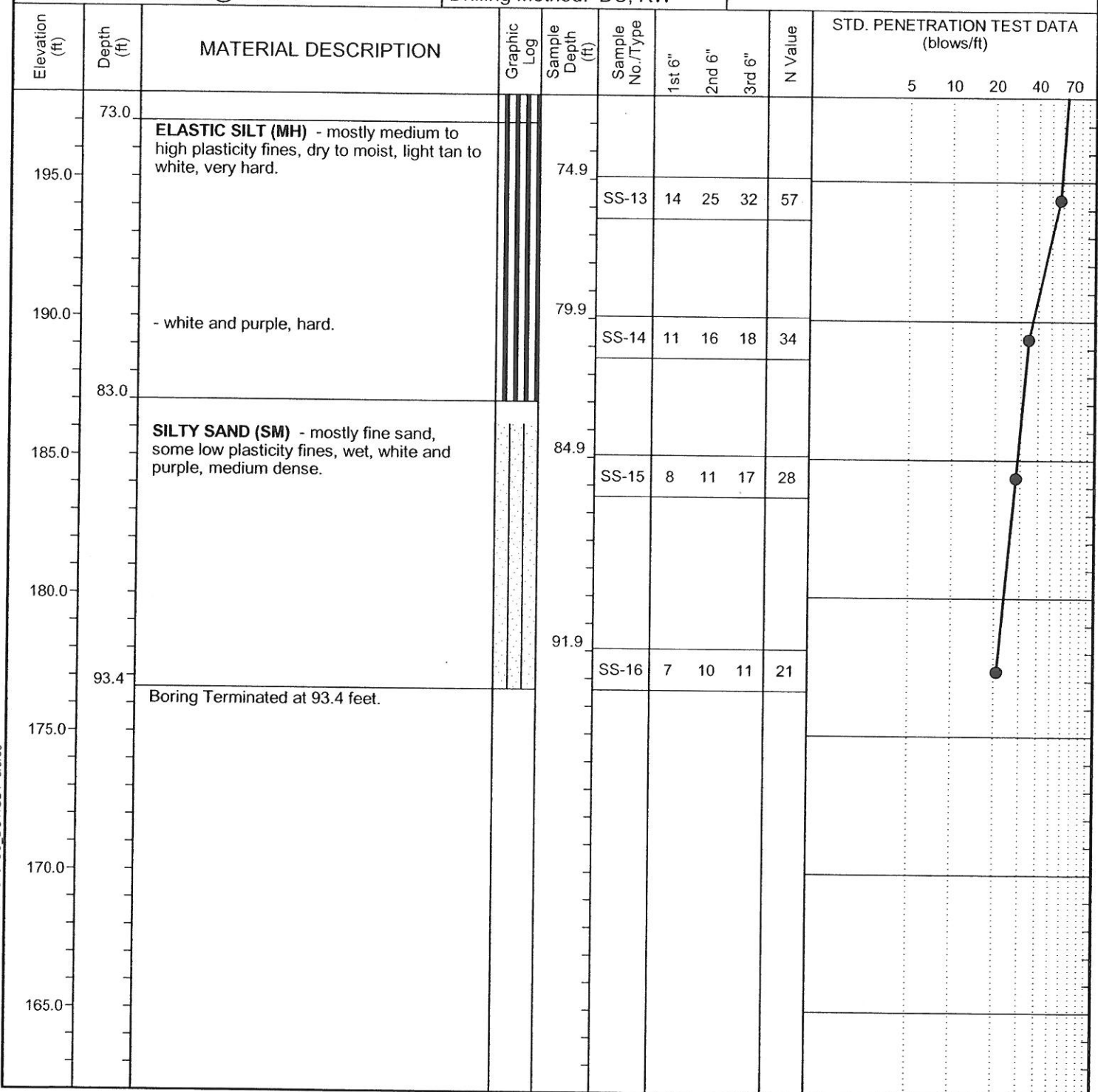
Hammer Type: ☐ Gravity ☒ Automatic ☐ Other:

Water Level: 13.5 ft. @ 24 hrs.

Drilling Method: DC, RW

Notes:

**Final Boring Log (05/05/05).** BK-51  
Drill Rig. Driving casing 0-25.4 ft. Mud  
rotary with drag bit 25.4-93.4 ft. Artesian  
pressure encountered.



## LEGEND

SS - Split Spoon  
ST - Shelby Tube  
AWG - Rock Core, 1-1/8"

## SAMPLER TYPE

NQ - Rock Core, 1-7/8"  
CU - Cuttings  
CT - Continuous Tube

## DRILLING METHOD

HSA - Hollow Stem Auger  
CFA - Continuous Flight Augers  
DC - Driving Casing  
RW - Rotary Wash  
RC - Rock Core



## RBO South Fork Edisto River and Cedar Creek

Aiken County, South Carolina

File #: 2.127B.01, PIN#: 26432, S&amp;ME #: 1611-04-386

## LOG OF BORING No. B-15

Station:

520+42

Offset:

39 ft. L of C/L

Date Drilled: 02/15/05

Supervisor: TH

Casing Length: 25.4 ft.

Ground Elevation: 270.0

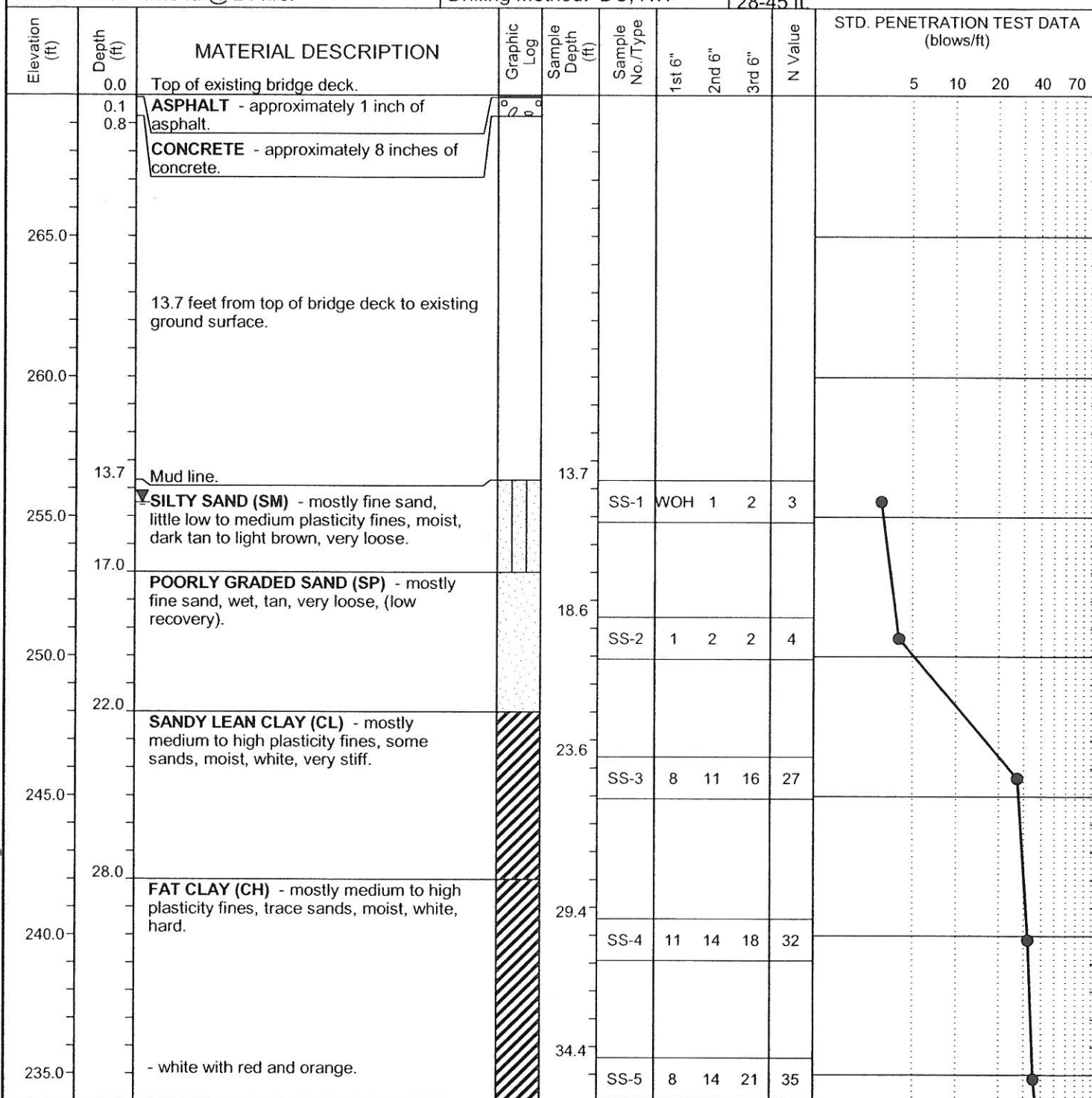
Hammer Type: ☐ Gravity ☒ Automatic ☐ Other:

Water Level: 14.5 ft. @ 24 hrs.

Drilling Method: DC, RW

Notes:

**Final Boring Log (05/05/05).** BK-51 Drill Rig. Driving casing 0-25.4 ft. Mud rotary with drag bit 25.4-90.9 ft. Artesian pressure encountered. Creosote odor noted by drilling crew from 14-29 ft. and 28-45 ft.



## LEGEND

Continued Next Page

## SAMPLER TYPE

SS - Split Spoon  
ST - Shelby Tube  
AWG - Rock Core, 1-1/8"

NQ - Rock Core, 1-7/8"  
CU - Cuttings  
CT - Continuous Tube

## DRILLING METHOD

HSA - Hollow Stem Auger  
CFA - Continuous Flight Augers  
DC - Driving Casing

RW - Rotary Wash  
RC - Rock Core





RBO South Fork Edisto River and Cedar Creek

Aiken County, South Carolina

File #: 2.127B.01, PIN#: 26432, S&ME #: 1611-04-386

## LOG OF BORING No. B-15

Station:

520+42

Offset:

39 ft. L of C/L

Date Drilled: 02/15/05

Supervisor: TH

Casing Length: 25.4 ft.

Ground Elevation: 270.0

Hammer Type: ☐ Gravity ☒ Automatic ☐ Other:

Water Level: 14.5 ft. @ 24 hrs.

Drilling Method: DC, RW

Notes:

**Final Boring Log (05/05/05).** BK-51 Drill Rig. Driving casing 0-25.4 ft. Mud rotary with drag bit 25.4-90.9 ft. Artesian pressure encountered. Creosote odor noted by drilling crew from 14-29 ft. and 28-45 ft.

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" 2nd 6" 3rd 6"			N Value	STD. PENETRATION TEST DATA (blows/ft)				
										5	10	20	40	70
230.0		- dry, white.		39.4	SS-6	11	19	24	43					
225.0		- white with purple, red, orange.		44.4	SS-7	13	18	29	47					
220.0		- white with red and orange.		49.4	SS-8	10	17	29	46					
215.0		- moist, white with pink and orange.		54.4	SS-9	9	17	22	39					
210.0		- white.		59.4	SS-10	10	17	23	40					
62.0		<b>SILTY SAND (SM)</b> - mostly fine to medium sand, some low plasticity fines, moist to wet, white and purple, dense.		64.4	SS-11	14	17	19	36					
205.0														
68.0		<b>ELASTIC SILT WITH SAND (MH)</b> - mostly medium to high plasticity fines, few fine sands, dry to moist, tan, very hard.		69.4	SS-12	15	33	39	72					
200.0														

### LEGEND

Continued Next Page

**SAMPLER TYPE**  
 SS - Split Spoon  
 ST - Shelby Tube  
 AWG - Rock Core, 1-1/8"  
 NQ - Rock Core, 1-7/8"  
 CU - Cuttings  
 CT - Continuous Tube

**DRILLING METHOD**  
 HSA - Hollow Stem Auger  
 CFA - Continuous Flight Augers  
 DC - Driving Casing  
 RW - Rotary Wash  
 RC - Rock Core



<b>RBO South Fork Edisto River and Cedar Creek</b> <b>Aiken County, South Carolina</b> <b>File #: 2.127B.01, PIN#: 26432, S&amp;ME #: 1611-04-386</b>					<b>LOG OF BORING No. B-15</b>									
Date Drilled: 02/15/05			Supervisor: TH			Notes: <b>Final Boring Log (05/05/05).</b> BK-51 Drill Rig. Driving casing 0-25.4 ft. Mud rotary with drag bit 25.4-90.9 ft. Artesian pressure encountered. Creosote odor noted by drilling crew from 14-29 ft. and 28-45 ft.								
Casing Length: 25.4 ft.			Ground Elevation: 270.0											
Hammer Type: <input type="checkbox"/> Gravity <input checked="" type="checkbox"/> Automatic <input type="checkbox"/> Other:														
Water Level: 14.5 ft. @ 24 hrs.			Drilling Method: DC, RW											
Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	N Value	STD. PENETRATION TEST DATA (blows/ft)				
										5	10	20	40	70
195.0		- slight decrease in sand content, dry.		74.4										
	78.0				SS-13	19	39	49	88					
190.0		<b>SILTY SAND (SM)</b> - mostly fine sand, some low to medium plasticity fines, moist, pink and purple, dense.			79.4									
					SS-14	12	17	19	36					
185.0		- slight decrease in fines, white and purple, medium dense.		84.4										
					SS-15	7	8	11	19					
180.0				89.4										
	90.9	Boring Terminated at 90.9 feet.			SS-16	7	9	12	21					

**LEGEND**

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
ST - Shelby Tube	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	



RBO South Fork Edisto River and Cedar Creek

Aiken County, South Carolina

File #: 2.127B.01, PIN#: 26432, S&ME #: 1611-04-386

## LOG OF BORING No. B-16

Station:

520+72

Offset:

39 ft. L of C/L

Date Drilled: 02/16/05

Supervisor: TH

Casing Length: 30.4 ft.

Ground Elevation: 270.0

Hammer Type: ☐ Gravity ☒ Automatic ☐ Other:

Notes:

**Final Boring Log (005/05/05).** BK-51 Drill Rig. Driving casing 0-30.4 ft. Mud rotary with drag bit 30.4-96 ft. Artesian pressure encountered.

Water Level: 14.5 ft. @ 24 hrs.

Drilling Method: DC, RW

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	N Value	STD. PENETRATION TEST DATA (blows/ft)				
	0.0	Top of existing bridge deck.								5	10	20	40	70
	0.1	ASPHALT - approximately 1 inch of asphalt.												
	0.8	CONCRETE - approximately 8 inches of concrete.												
265.0														
260.0		14.8 feet from top of bridge deck to existing ground surface.												
255.0	14.8	Mud line.		14.8	SS-1	WOH			WOH					
	18.0	SILTY SAND (SM) - mostly fine sand, some low to medium plasticity fines, wet, light brown, very loose.												
250.0		POORLY GRADED SAND (SP) - mostly fine to medium sand, wet, light tan, loose.		18.8	SS-2	5	3	4	7					
245.0				23.7	SS-3	3	3	4	7					
240.0	27.0	FAT CLAY (CH) - mostly medium to high plasticity fines, trace sand, dry, light orange and purple, very hard.		28.7	SS-4	18	24	27	51					
235.0		- no sand, moist, white with little red and orange, hard.		34.5	SS-5	10	17	24	41					

### LEGEND

Continued Next Page

**SAMPLER TYPE**  
 SS - Split Spoon  
 ST - Shelby Tube  
 AWG - Rock Core, 1-1/8"  
 NQ - Rock Core, 1-7/8"  
 CU - Cuttings  
 CT - Continuous Tube

**DRILLING METHOD**  
 HSA - Hollow Stem Auger  
 CFA - Continuous Flight Augers  
 DC - Driving Casing  
 RW - Rotary Wash  
 RC - Rock Core



RBO South Fork Edisto River and Cedar Creek

Aiken County, South Carolina

File #: 2.127B.01, PIN#: 26432, S&ME #: 1611-04-386

## LOG OF BORING No. B-16

Station:

520+72

Offset:

39 ft. L of C/L

Date Drilled: 02/16/05

Supervisor: TH

Casing Length: 30.4 ft.

Ground Elevation: 270.0

Hammer Type: ☐ Gravity ☒ Automatic ☐ Other:

Water Level: 14.5 ft. @ 24 hrs.

Drilling Method: DC, RW

Notes:

**Final Boring Log (005/05/05).** BK-51 Drill Rig. Driving casing 0-30.4 ft. Mud rotary with drag bit 30.4-96 ft. Artesian pressure encountered.

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"			N Value	STD. PENETRATION TEST DATA (blows/ft)				
						1st 6"	2nd 6"	3rd 6"		5	10	20	40	70
230.0		- purple and white.		39.5	SS-6	12	20	28	48					
225.0		- white.		44.5	SS-7	15	21	28	49					
220.0		- dry, white, orange, red, very hard.		49.5	SS-8	12	24	30	54					
215.0		- white, very hard to hard.		54.5	SS-9	14	22	31	53					
210.0				59.5	SS-10	13	17	21	38					
63.0		<b>SILTY SAND (SM)</b> - mostly fine to medium sand, some low plasticity fines, wet, white and purple, medium dense.		64.5	SS-11	10	10	14	24					
205.0														
68.0		<b>ELASTIC SILT WITH SAND (MH)</b> - mostly medium to high plasticity fines, few fine sands, dry, light tan to white, hard to very hard.		69.5	SS-12	12	16	27	43					
200.0														

### LEGEND

Continued Next Page

**SAMPLER TYPE**  
 SS - Split Spoon  
 ST - Shelby Tube  
 AWG - Rock Core, 1-1/8"  
 NQ - Rock Core, 1-7/8"  
 CU - Cuttings  
 CT - Continuous Tube

**DRILLING METHOD**  
 HSA - Hollow Stem Auger  
 CFA - Continuous Flight Augers  
 DC - Driving Casing  
 RW - Rotary Wash  
 RC - Rock Core



RBO South Fork Edisto River and Cedar Creek

Aiken County, South Carolina

File #: 2.127B.01, PIN#: 26432, S&ME #: 1611-04-386

## LOG OF BORING No. B-16

Station:

520+72

Offset:

39 ft. L of C/L

Date Drilled: 02/16/05

Supervisor: TH

Casing Length: 30.4 ft.

Ground Elevation: 270.0

Hammer Type: ☐ Gravity ☒ Automatic ☐ Other:

Water Level: 14.5 ft. @ 24 hrs.

Drilling Method: DC, RW

Notes:

**Final Boring Log (005/05/05).** BK-51 Drill Rig. Driving casing 0-30.4 ft. Mud rotary with drag bit 30.4-96 ft. Artesian pressure encountered.

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" 2nd 6" 3rd 6"			N Value	STD. PENETRATION TEST DATA (blows/ft)				
						1st 6"	2nd 6"	3rd 6"		5	10	20	40	70
195.0				74.5	SS-13	22	26	26	52					
190.0		- white and purple.		79.5	SS-14	15	23	31	54					
83.0		<b>SILTY SAND (SM)</b> - mostly fine sand, some low plasticity fines, moist to wet, white, medium dense.		84.5	SS-15	7	10	14	24					
185.0														
180.0		- white and purple, dense.		89.5	SS-16	8	16	28	44					
175.0		- white with purple.		94.5	SS-17	9	11	20	31					
		Boring Terminated at 96 feet.												
170.0														
165.0														

### LEGEND

#### SAMPLER TYPE

SS - Split Spoon  
ST - Shelby Tube  
AWG - Rock Core, 1-1/8"

NQ - Rock Core, 1-7/8"  
CU - Cuttings  
CT - Continuous Tube

#### DRILLING METHOD

HSA - Hollow Stem Auger  
CFA - Continuous Flight Augers  
DC - Driving Casing

RW - Rotary Wash  
RC - Rock Core





RBO South Fork Edisto River and Cedar Creek

Aiken County, South Carolina

File #: 2.127B.01, PIN#: 26432, S&amp;ME #: 1611-04-386

## LOG OF BORING No. B-17

Station:

521+02

Offset:

39 ft. L of C/L

Date Drilled: 03/02/05

Supervisor: TH

Casing Length: 30 ft.

Ground Elevation: 270.0

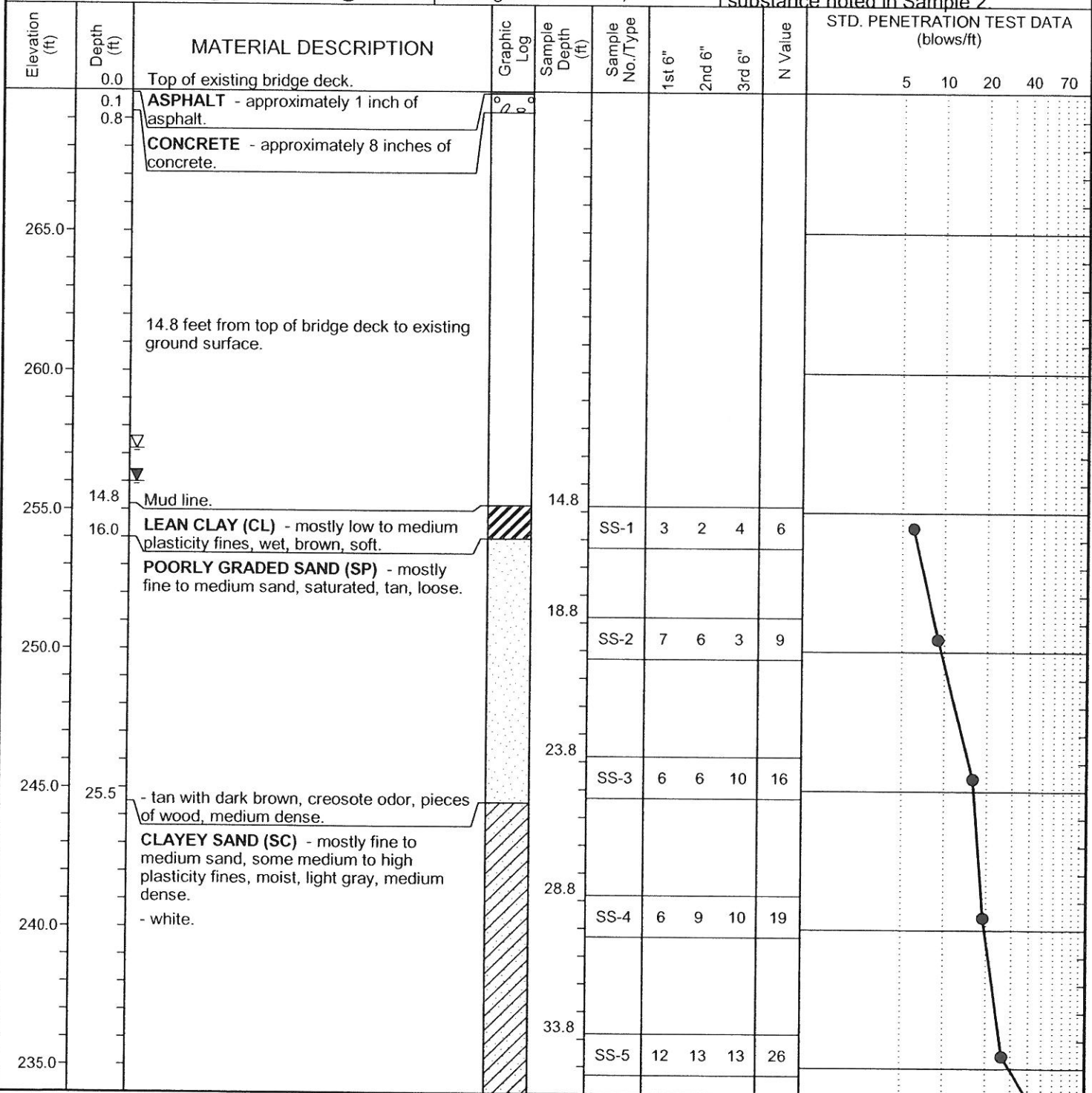
Hammer Type: ☒ Gravity ☐ Automatic ☐ Other:

Water Level: 12.8 ft. @ TOB. 14 ft. @ 24 hrs.

Drilling Method: DC, RW

Notes:

**Final Boring Log (05/05/05).** Mobile B-57 Drill Rig. Driving casing 0-30 ft. Mud rotary with drag bit 30-95.3 ft. Artesian pressure encountered. Creosote odor and dark brown fluid substance noted in Sample 2



## LEGEND

Continued Next Page

## SAMPLER TYPE

## DRILLING METHOD

SS - Split Spoon  
ST - Shelby Tube  
AWG - Rock Core, 1-1/8"

NQ - Rock Core, 1-7/8"  
CU - Cuttings  
CT - Continuous Tube

HSA - Hollow Stem Auger  
CFA - Continuous Flight Augers  
DC - Driving Casing

RW - Rotary Wash  
RC - Rock Core



RBO South Fork Edisto River and Cedar Creek

Aiken County, South Carolina

File #: 2.127B.01, PIN#: 26432, S&ME #: 1611-04-386

# LOG OF BORING No. B-17

Station:

521+02

Offset:

39 ft. L of C/L

Date Drilled: 03/02/05

Supervisor: TH

Casing Length: 30 ft.

Ground Elevation: 270.0

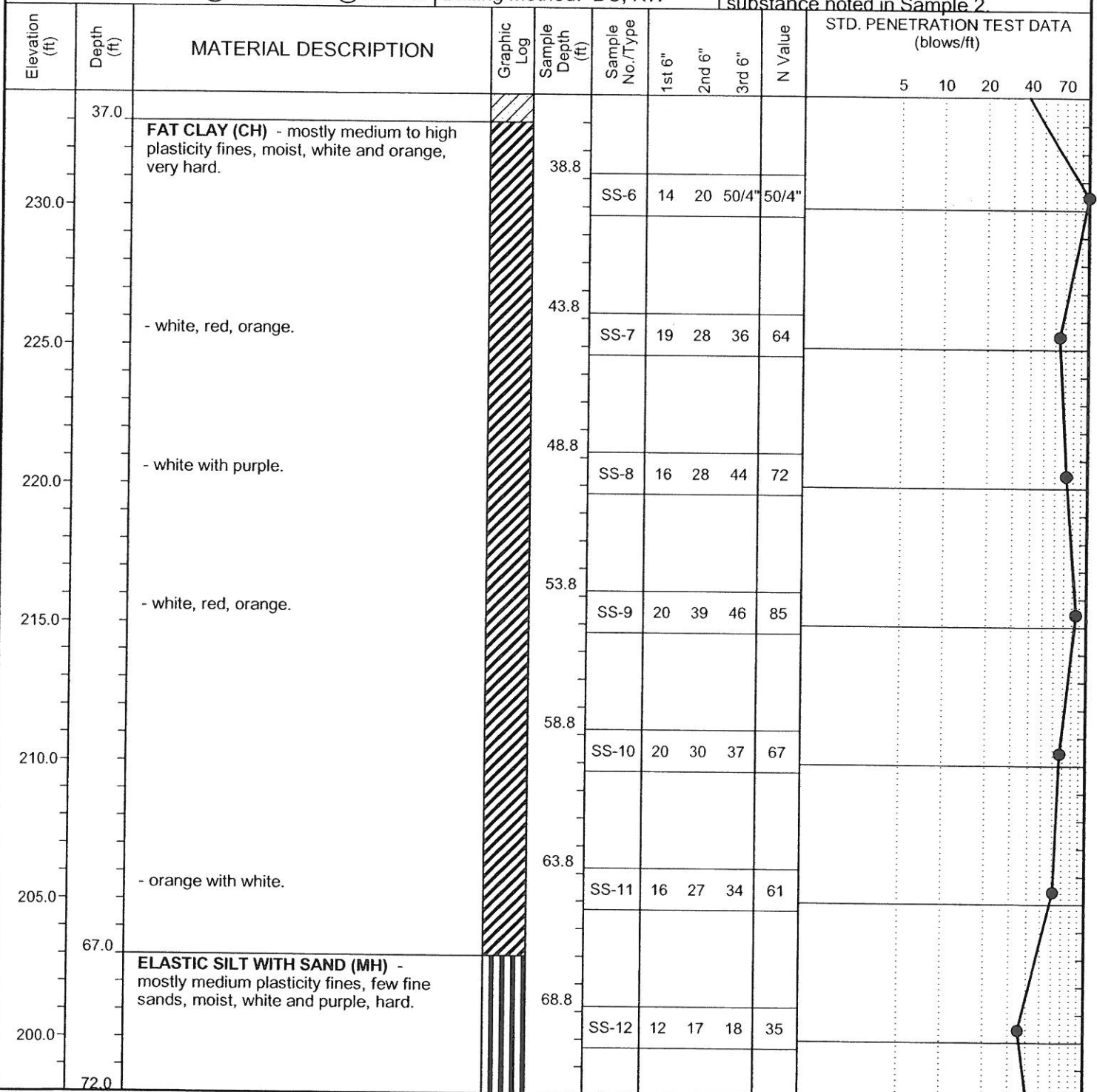
Hammer Type: ☒ Gravity ☐ Automatic ☐ Other:

Water Level: 12.8 ft. @ TOB. 14 ft. @ 24 hrs.

Drilling Method: DC, RW

Notes:

**Final Boring Log (05/05/05).** Mobile B-57 Drill Rig. Driving casing 0-30 ft. Mud rotary with drag bit 30-95.3 ft. Artesian pressure encountered. Creosote odor and dark brown fluid substance noted in Sample 2.



## LEGEND

Continued Next Page

### SAMPLER TYPE

SS - Split Spoon  
ST - Shelby Tube  
AWG - Rock Core, 1-1/8"

NQ - Rock Core, 1-7/8"  
CU - Cuttings  
CT - Continuous Tube

### DRILLING METHOD

HSA - Hollow Stem Auger  
CFA - Continuous Flight Augers  
DC - Driving Casing

RW - Rotary Wash  
RC - Rock Core



RBO South Fork Edisto River and Cedar Creek

Aiken County, South Carolina

File #: 2.127B.01, PIN#: 26432, S&amp;ME #: 1611-04-386

## LOG OF BORING No. B-17

Station:

521+02

Offset:

39 ft. L of C/L

Date Drilled: 03/02/05

Supervisor: TH

Casing Length: 30 ft.

Ground Elevation: 270.0

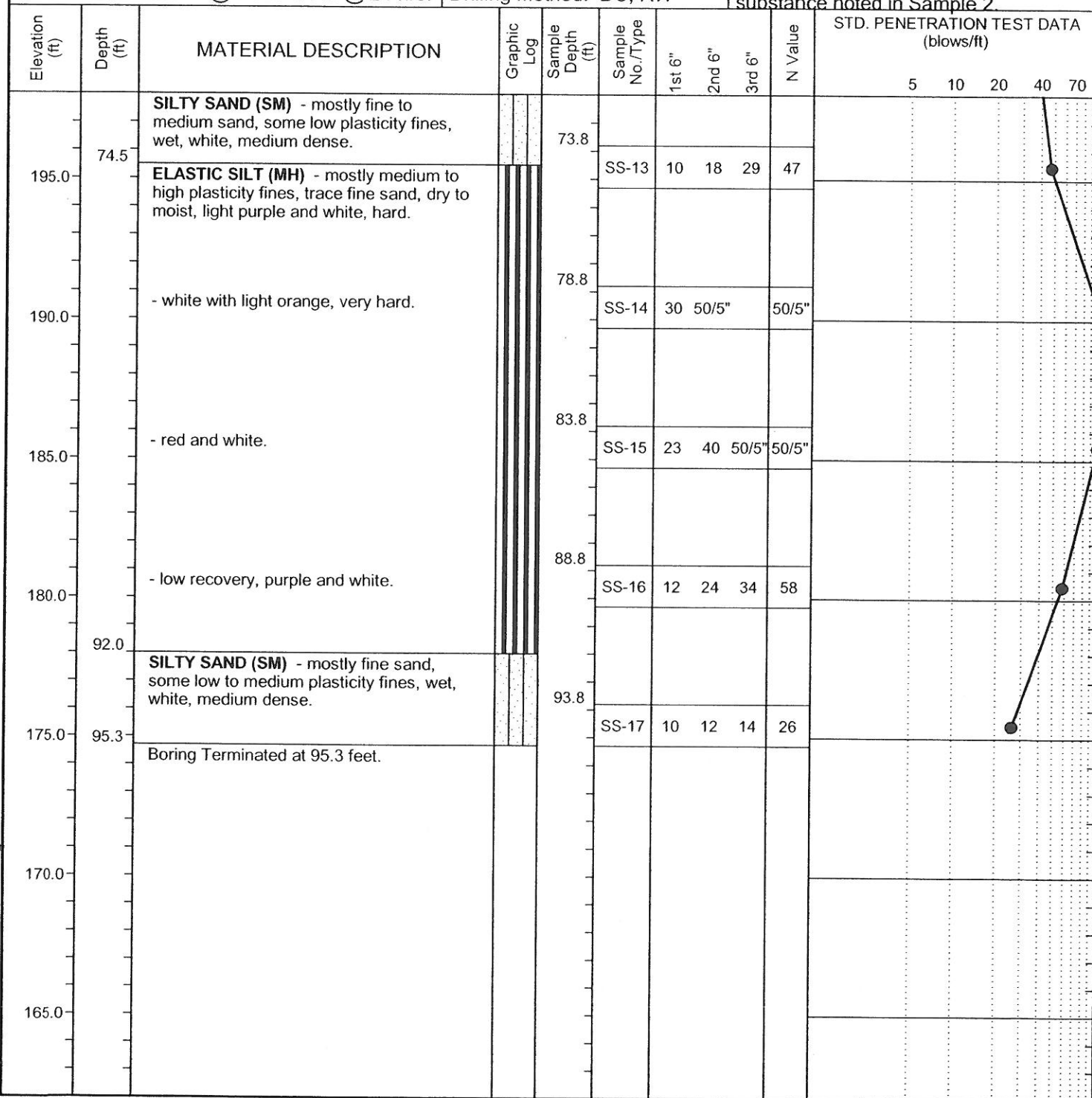
Hammer Type: ☒ Gravity ☐ Automatic ☐ Other:

Water Level: 12.8 ft. @ TOB. 14 ft. @ 24 hrs.

Drilling Method: DC, RW

Notes:

**Final Boring Log (05/05/05).** Mobile B-57 Drill Rig. Driving casing 0-30 ft. Mud rotary with drag bit 30-95.3 ft. Artesian pressure encountered. Creosote odor and dark brown fluid substance noted in Sample 2.



## LEGEND

## SAMPLER TYPE

SS - Split Spoon  
ST - Shelby Tube  
AWG - Rock Core, 1-1/8"

NQ - Rock Core, 1-7/8"  
CU - Cuttings  
CT - Continuous Tube

## DRILLING METHOD

HSA - Hollow Stem Auger  
CFA - Continuous Flight Augers  
DC - Driving Casing

RW - Rotary Wash  
RC - Rock Core



RBO South Fork Edisto River and Cedar Creek

Aiken County, South Carolina

File #: 2.127B.01, PIN#: 26432, S&amp;ME #: 1611-04-386

## LOG OF BORING No. B-18

Station:

521+32

Offset:

39 ft. L of C/L

Date Drilled: 02/17/05

Supervisor: TH

Casing Length: 30.4 ft.

Ground Elevation: 270.0

Hammer Type: ☐ Gravity ☒ Automatic ☐ Other:

Water Level: 14.5 ft. @ 24 hrs.

Drilling Method: DC, RW

Notes:

**Final Boring Log (05/05/05).** BK-51  
Drill Rig. Driving casing 0-30.4 ft. Mud rotary with drag bit 30.4-96.1 ft. Artesian pressure encountered.

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	N Value	STD. PENETRATION TEST DATA (blows/ft)				
	0.0	Top of existing bridge deck.								5	10	20	40	70
	0.1	ASPHALT - approximately 1 inch of asphalt.												
	0.8	CONCRETE - approximately 8 inches of concrete.												
265.0														
260.0		15.9 feet from top of bridge deck to existing ground surface.												
255.0														
	15.9	Mud line.		15.9	SS-1	WOH			WOH					
	18.4	SILTY SAND (SM) - mostly low to medium plasticity fines, few fine sands, organic odor, wet, dark brown, very soft.		18.7										
250.0		WOOD - black stained pieces of wood recovered in spoon.			SS-2	10	5	5	10					
	21.4	SANDY FAT CLAY (CH) - mostly medium plasticity fines, some fine sand, small piece of wood, creosote odor, wet, white, very stiff, (low recovery).												
245.0				23.8	SS-3	9	7	9	16					
240.0		- moist, white and purple, hard.		28.8	SS-4	11	15	18	33					
235.0	33.0	FAT CLAY (CH) - mostly medium plasticity fines, dry to moist, white, dark purple, orange, hard.		34.6	SS-5	8	13	20	33					

## LEGEND

Continued Next Page

## SAMPLER TYPE

SS - Split Spoon  
ST - Shelby Tube  
AWG - Rock Core, 1-1/8"

NQ - Rock Core, 1-7/8"  
CU - Cuttings  
CT - Continuous Tube

## DRILLING METHOD

HSA - Hollow Stem Auger  
CFA - Continuous Flight Augers  
DC - Driving Casing

RW - Rotary Wash  
RC - Rock Core



RBO South Fork Edisto River and Cedar Creek

Aiken County, South Carolina

File #: 2.127B.01, PIN#: 26432, S&ME #: 1611-04-386

## LOG OF BORING No. B-18

Station:

521+32

Offset:

39 ft. L of C/L

Date Drilled: 02/17/05

Supervisor: TH

Casing Length: 30.4 ft.

Ground Elevation: 270.0

Hammer Type: ☐ Gravity ☒ Automatic ☐ Other:

Notes:

**Final Boring Log (05/05/05).** BK-51  
Drill Rig. Driving casing 0-30.4 ft. Mud rotary with drag bit 30.4-96.1 ft. Artesian pressure encountered.

Water Level: 14.5 ft. @ 24 hrs.

Drilling Method: DC, RW

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	N Value	STD. PENETRATION TEST DATA (blows/ft)				
										5	10	20	40	70
230.0		- mostly medium to high plasticity fines, moist, white, purple, dark red.		39.6										
					SS-6	9	14	23	37					
225.0		- white, orange, purple, dark red.		44.6										
					SS-7	12	21	27	48					
220.0		- mostly medium plasticity fines, white and orange.		49.6										
					SS-8	9	19	31	50					
215.0				54.6										
					SS-9	11	17	23	40					
210.0		- white and orange with red.		59.6										
					SS-10	11	16	21	37					
63.0		<b>ELASTIC SILT WITH SAND (MH)</b> - mostly medium plasticity fines, few fine sands, moist, white and purple, hard.		64.6										
205.0					SS-11	11	15	17	32					
68.0		<b>SILTY SAND (SM)</b> - mostly fine to medium sand, some low plasticity fines, wet, white with purple, medium dense.		69.6										
200.0					SS-12	7	11	17	28					

### LEGEND

#### SAMPLER TYPE

SS - Split Spoon  
ST - Shelby Tube  
AWG - Rock Core, 1-1/8"

NQ - Rock Core, 1-7/8"  
CU - Cuttings  
CT - Continuous Tube

#### DRILLING METHOD

HSA - Hollow Stem Auger  
CFA - Continuous Flight Augers  
DC - Driving Casing

Continued Next Page





RBO South Fork Edisto River and Cedar Creek

Aiken County, South Carolina

File #: 2.127B.01, PIN#: 26432, S&amp;ME #: 1611-04-386

## LOG OF BORING No. B-18

Station:

521+32

Offset:

39 ft. L of C/L

Date Drilled: 02/17/05

Supervisor: TH

Casing Length: 30.4 ft.

Ground Elevation: 270.0

Hammer Type: ☐ Gravity ☒ Automatic ☐ Other:

Water Level: 14.5 ft. @ 24 hrs.

Drilling Method: DC, RW

Notes:

**Final Boring Log (05/05/05).** BK-51  
Drill Rig. Driving casing 0-30.4 ft. Mud  
rotary with drag bit 30.4-96.1 ft. Artesian  
pressure encountered.

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	N Value	STD. PENETRATION TEST DATA (blows/ft)				
										5	10	20	40	70
73.0		<b>ELASTIC SILT WITH SAND (MH)</b> - mostly medium plasticity fines, few fine sands, dry to moist, white, hard to very hard.		74.6										
195.0					SS-13	14	20	29	49					
				79.6										
190.0		<b>ELASTIC SILT (MH)</b> - mostly medium plasticity fines, moist, white and red, hard.			SS-14	15	23	28	51					
83.0				84.6										
185.0					SS-15	10	15	24	39					
89.0		<b>ELASTIC SILT WITH SAND (MH)</b> - mostly medium plasticity fines, few fine sands, moist, white, very stiff.		89.6										
180.0					SS-16	7	11	16	27					
93.0				94.6										
175.0		<b>SILTY SAND (SM)</b> - mostly fine sand, some low plasticity fines, wet, white, medium dense.			SS-17	6	8	10	18					
96.1		Boring Terminated at 96.1 feet.												
170.0														
165.0														

## LEGEND

## SAMPLER TYPE

SS - Split Spoon  
ST - Shelby Tube  
AWG - Rock Core, 1-1/8"

NQ - Rock Core, 1-7/8"  
CU - Cuttings  
CT - Continuous Tube

## DRILLING METHOD

HSA - Hollow Stem Auger  
CFA - Continuous Flight Augers  
DC - Driving Casing

RW - Rotary Wash  
RC - Rock Core



## RBO South Fork Edisto River and Cedar Creek

Aiken County, South Carolina

File #: 2.127B.01, PIN#: 26432, S&amp;ME #: 1611-04-386

## LOG OF BORING No. B-19

Station:

521+62

Offset:

39 ft. L of C/L

Date Drilled: 02/16/05

Supervisor: TH

Casing Length: 30 ft.

Ground Elevation: 270.0

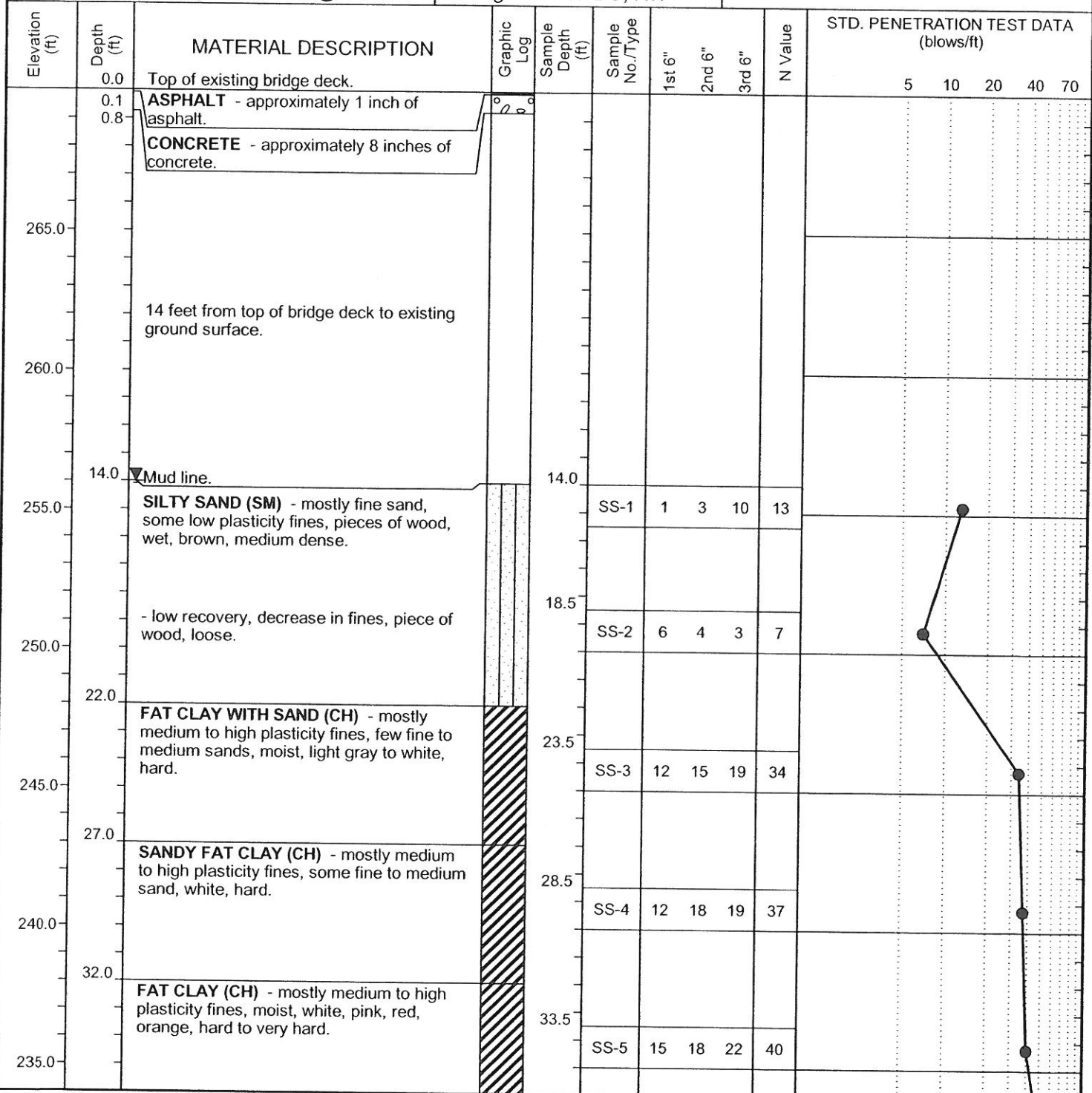
Hammer Type: ☒ Gravity ☐ Automatic ☐ Other:

Notes:

**Final Boring Log (05/05/05).** Mobile B-57 Drill Rig. Driving casing 0-30 ft. Mud rotary with drag bit 30-95 ft. Artesian pressure encountered.

Water Level: 14 ft. @ TOB. 14 ft. @ 24 hrs.

Drilling Method: DC, RW



## LEGEND

Continued Next Page

## SAMPLER TYPE

SS - Split Spoon  
ST - Shelby Tube  
AWG - Rock Core, 1-1/8"

NQ - Rock Core, 1-7/8"  
CU - Cuttings  
CT - Continuous Tube

## DRILLING METHOD

HSA - Hollow Stem Auger  
CFA - Continuous Flight Augers  
DC - Driving Casing

RW - Rotary Wash  
RC - Rock Core



RBO South Fork Edisto River and Cedar Creek

Aiken County, South Carolina

File #: 2.127B.01, PIN#: 26432, S&amp;ME #: 1611-04-386

## LOG OF BORING No. B-19

Station:

521+62

Offset:

39 ft. L of C/L

Date Drilled: 02/16/05

Supervisor: TH

Notes:

**Final Boring Log (05/05/05).** Mobile B-57 Drill Rig. Driving casing 0-30 ft. Mud rotary with drag bit 30-95 ft. Artesian pressure encountered.

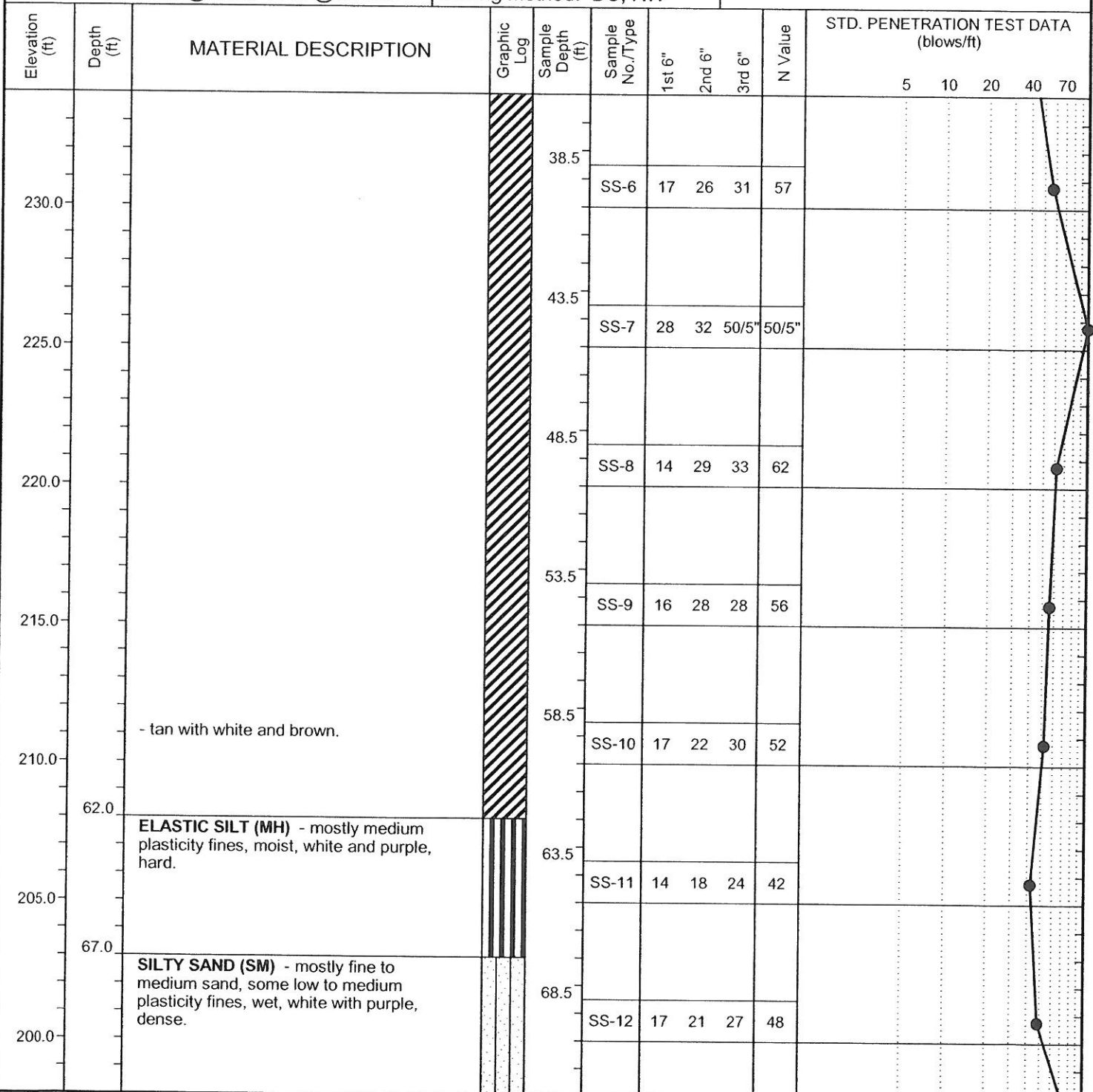
Casing Length: 30 ft.

Ground Elevation: 270.0

Hammer Type: ☒ Gravity ☐ Automatic ☐ Other:

Water Level: 14 ft. @ TOB. 14 ft. @ 24 hrs.

Drilling Method: DC, RW



## LEGEND

Continued Next Page

SAMPLER TYPE  
SS - Split Spoon  
ST - Shelby Tube  
AWG - Rock Core, 1-1/8"

NQ - Rock Core, 1-7/8"  
CU - Cuttings  
CT - Continuous Tube

DRILLING METHOD  
HSA - Hollow Stem Auger  
CFA - Continuous Flight Augers  
DC - Driving Casing

RW - Rotary Wash  
RC - Rock Core



RBO South Fork Edisto River and Cedar Creek

Aiken County, South Carolina

File #: 2.127B.01, PIN#: 26432, S&ME #: 1611-04-386

# LOG OF BORING No. B-19

Station:

521+62

Offset:

39 ft. L of C/L

Date Drilled: 02/16/05

Supervisor: TH

Notes:

**Final Boring Log (05/05/05).** Mobile B-57 Drill Rig. Driving casing 0-30 ft. Mud rotary with drag bit 30-95 ft. Artesian pressure encountered.

Casing Length: 30 ft.

Ground Elevation: 270.0

Hammer Type: ☒ Gravity ☐ Automatic ☐ Other:

Water Level: 14 ft. @ TOB. 14 ft. @ 24 hrs.

Drilling Method: DC, RW

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	N Value	STD. PENETRATION TEST DATA (blows/ft)				
										5	10	20	40	70
195.0	73.0	<b>ELASTIC SILT (MH)</b> - mostly medium to high plasticity fines, moist, white, very hard.  - white and light red.  - white with red.		73.5	SS-13	17	47	50/5"	50/5"					
190.0				78.5	SS-14	32	50/5"		50/5"					
185.0				83.5	SS-15	15	27	42	69					
180.0	87.0	<b>ELASTIC SILT WITH SAND (MH)</b> - mostly medium plasticity fines, few fine sands, moist, brown, very hard.		88.5	SS-16	14	20	32	52					
175.0	92.0	<b>SILTY SAND (SM)</b> - mostly fine to medium sand, some low to medium plasticity fines, wet, white, dense.		93.5	SS-17	12	20	18	38					
170.0	95.0	Boring Terminated at 95 feet.												

## LEGEND

**SAMPLER TYPE**  
 SS - Split Spoon  
 ST - Shelby Tube  
 AWG - Rock Core, 1-1/8"  
 NQ - Rock Core, 1-7/8"  
 CU - Cuttings  
 CT - Continuous Tube

**DRILLING METHOD**  
 HSA - Hollow Stem Auger  
 CFA - Continuous Flight Augers  
 DC - Driving Casing  
 RW - Rotary Wash  
 RC - Rock Core



RBO South Fork Edisto River and Cedar Creek

Aiken County, South Carolina

File #: 2.127B.01, PIN#: 26432, S&amp;ME #: 1611-04-386

## LOG OF BORING No. B-20

Station:

521+92

Offset:

39.5 ft. L of C/L

Date Drilled: 02/23/05

Supervisor: TH

Casing Length: 30 ft.

Ground Elevation: 270.0

Hammer Type: ☒ Gravity ☐ Automatic ☐ Other:

Water Level: 14.2 ft. @ TOB.

Drilling Method: DC, RW

Notes:

**Final Boring Log (05/05/05).** Mobile B-57 Drill Rig. Driving casing 0-30 ft. Mud rotary with drag bit 30-95.4 ft. Artesian pressure encountered.

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	N Value	STD. PENETRATION TEST DATA (blows/ft)				
	0.0	Top of existing bridge deck.								5	10	20	40	70
	0.1	ASPHALT - approximately 1 inch of asphalt.												
	0.8	CONCRETE - approximately 8 inches of concrete.												
265.0														
260.0		13.9 feet from top of bridge deck to existing ground surface.												
255.0	13.9	Mud line.		13.9	SS-1	5	2	4	6					
250.0	19.5	LEAN CLAY WITH SAND (CL) - mostly medium plasticity fines, few fine to medium sands, piece of wood, wet, brown, firm.		18.9	SS-2	6	6	8	14					
245.0	22.0	POORLY GRADED SAND (SP) - mostly fine to medium sand, saturated, dark tan, medium dense.		23.9	SS-3	7	11	15	26					
240.0	27.0	SANDY FAT CLAY (CH) - mostly medium to high plasticity fines, some fine to medium sands, moist to wet, white, very stiff.		28.9	SS-4	18	23	26	49					
235.0	32.0	SILTY SAND (SM) - mostly fine to medium sand, some medium to high plasticity fines, moist, white, red, orange, dense.												
		FAT CLAY (CH) - mostly medium to high plasticity fines, moist, white, red, purple, orange, yellow, very hard.		33.9	SS-5	14	24	28	52					

## LEGEND

Continued Next Page

SAMPLER TYPE  
SS - Split Spoon  
ST - Shelby Tube  
AWG - Rock Core, 1-1/8"  
NQ - Rock Core, 1-7/8"  
CU - Cuttings  
CT - Continuous Tube

DRILLING METHOD  
HSA - Hollow Stem Auger  
CFA - Continuous Flight Augers  
DC - Driving Casing  
RW - Rotary Wash  
RC - Rock Core





RBO South Fork Edisto River and Cedar Creek

Aiken County, South Carolina

File #: 2.127B.01, PIN#: 26432, S&amp;ME #: 1611-04-386

## LOG OF BORING No. B-20

Station:

521+92

Offset:

39.5 ft. L of C/L

Date Drilled: 02/23/05

Supervisor: TH

Casing Length: 30 ft.

Ground Elevation: 270.0

Hammer Type: ☒ Gravity ☐ Automatic ☐ Other:

Water Level: 14.2 ft. @ TOB.

Drilling Method: DC, RW

Notes:

**Final Boring Log (05/05/05).** Mobile B-57 Drill Rig. Driving casing 0-30 ft. Mud rotary with drag bit 30-95.4 ft. Artesian pressure encountered.

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	N Value	STD. PENETRATION TEST DATA (blows/ft)				
										5	10	20	40	70
230.0		- yellow and white with red.		38.9	SS-6	17	29	36	65					
				43.9	SS-7	12	29	31	60					
225.0		- white, yellow, red, orange.		48.9	SS-8	20	25	34	59					
220.0		- light purple.		53.9	SS-9	18	26	36	62					
215.0		- light pink, white, yellow.		58.9	SS-10	16	32	35	67					
210.0		- white and light orange.		63.9	SS-11	14	22	29	51					
205.0		- white with brown.		68.9	SS-12	15	24	31	55					
200.0														
195.0														
190.0														
185.0														
180.0														
175.0														
170.0														
165.0														
160.0														
155.0														
150.0														
145.0														
140.0														
135.0														
130.0														
125.0														
120.0														
115.0														
110.0														
105.0														
100.0														
95.0														
90.0														
85.0														
80.0														
75.0														
70.0														
65.0														
60.0														
55.0														
50.0														
45.0														
40.0														
35.0														
30.0														
25.0														
20.0														
15.0														
10.0														
5.0														
0.0														
200.0		<b>SILTY SAND (SM)</b> - mostly fine sand, little low plasticity fines, wet, white, very dense.												
195.0														
190.0														
185.0														
180.0														
175.0														
170.0														
165.0														
160.0														
155.0														
150.0														
145.0														
140.0														
135.0														
130.0														
125.0														
120.0														
115.0														
110.0														
105.0														
100.0														
95.0														
90.0														
85.0														
80.0														
75.0														
70.0														
65.0														
60.0														
55.0														
50.0														
45.0														
40.0														
35.0														
30.0														
25.0														
20.0														
15.0														
10.0														
5.0														
0.0														

## LEGEND

Continued Next Page

## SAMPLER TYPE

SS - Split Spoon  
ST - Shelby Tube  
AWG - Rock Core, 1-1/8"

NQ - Rock Core, 1-7/8"  
CU - Cuttings  
CT - Continuous Tube

## DRILLING METHOD

HSA - Hollow Stem Auger  
CFA - Continuous Flight Augers  
DC - Driving Casing

RW - Rotary Wash  
RC - Rock Core



RBO South Fork Edisto River and Cedar Creek

Aiken County, South Carolina

File #: 2.127B.01, PIN#: 26432, S&amp;ME #: 1611-04-386

## LOG OF BORING No. B-20

Station:

521+92

Offset:

39.5 ft. L of C/L

Date Drilled: 02/23/05

Supervisor: TH

Notes:

**Final Boring Log (05/05/05).** Mobile B-57 Drill Rig. Driving casing 0-30 ft. Mud rotary with drag bit 30-95.4 ft. Artesian pressure encountered.

Casing Length: 30 ft.

Ground Elevation: 270.0

Hammer Type: ☒ Gravity ☐ Automatic ☐ Other:

Water Level: 14.2 ft. @ TOB.


Drilling Method: DC, RW

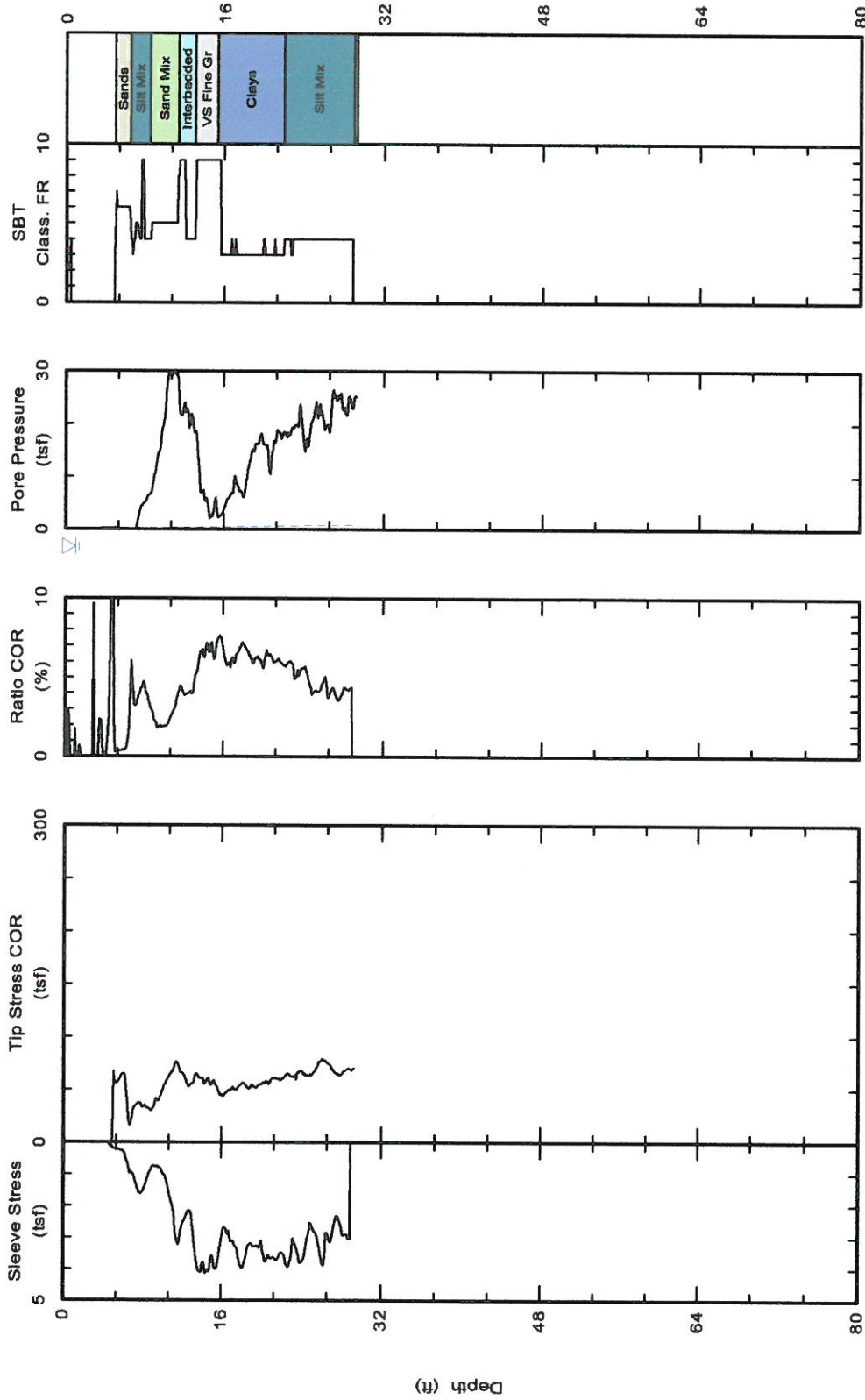
Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	STD. PENETRATION TEST DATA (blows/ft)				
						1st 6"	2nd 6"	3rd 6"	N Value	
										5 10 20 40 70
195.0		<b>ELASTIC SILT (MH)</b> - mostly medium to high plasticity fines, dry, white and tan, very hard.		73.9						
					SS-13	18	24	50/5"	50/5"	
190.0		- red and white.		78.9						
					SS-14	17	30	33	63	
185.0		- white.		83.9						
					SS-15	20	33	50/5"	50/5"	
180.0	87.0	<b>SANDY ELASTIC SILT (MH)</b> - mostly medium to high plasticity fines, some very fine sand, moist, light tan, very hard.		88.9						
					SS-16	18	35	50/5"	50/5"	
175.0	92.0	<b>SILTY SAND (SM)</b> - mostly fine sand, some low plasticity fines, wet, white, dense.		93.9						
					SS-17	12	17	20	37	
	95.4	Boring Terminated at 95.4 feet.								
170.0										
165.0										

## LEGEND

SAMPLER TYPE  
SS - Split Spoon  
ST - Shelby Tube  
AWG - Rock Core, 1-1/8"  
NQ - Rock Core, 1-7/8"  
CU - Cuttings  
CT - Continuous Tube

DRILLING METHOD  
HSA - Hollow Stem Auger  
CFA - Continuous Flight Augers  
DC - Driving Casing  
RW - Rotary Wash  
RC - Rock Core

 <p>S&amp;ME, Inc. (843) 884-0005 620 Wando Park Boulevard Mt. Pleasant, SC 29464 <a href="http://www.smeinc.com">www.smeinc.com</a></p>	<p>Station: 522+22 Offset: 39.5' L Surface Elevation: +255.5 Client: N/A Job Site: SC 4 Bridge over Edisto River</p>	<p>Date: 28/Feb/2005 Test ID: B-21 Project: 1611-04-386</p>
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Class FR: Friction Ratio Classification (Ref: Robertson 1990)

▽ Estimated Phreatic Surface



## RBO South Fork Edisto River and Cedar Creek

Aiken County, South Carolina

File #: 2.127B.01, PIN#: 26432, S&amp;ME #: 1611-04-386

## LOG OF BORING No. B-21

Station:

522+22

Offset:

39.5 ft. L of C/L

Date Drilled: 03/02/05

Supervisor: TH

Casing Length: 26.4 ft.

Ground Elevation: 270.0

Hammer Type: ☐ Gravity ☒ Automatic ☐ Other:

Water Level: 14.5 ft. @ TOB. 14 ft. @ 24 hrs.

Drilling Method: DC, RW

Notes:

**Final Boring Log (05/05/05).** BK-51  
Drill Rig. Driving casing 0-26.4 ft. Mud  
rotary with drag bit 26.4-94.1 ft. Artesian  
pressure encountered.

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	N Value	STD. PENETRATION TEST DATA (blows/ft)
	0.0	Top of existing bridge deck.								5 10 20 40 70
	0.1	ASPHALT - approximately 1 inch of								
	0.8	asphalt.								
		CONCRETE - approximately 8 inches of								
		concrete.								
265.0										
		15 feet from top of bridge deck to existing								
		ground surface.								
260.0										
255.0	15.0	Mud line.		15.0						
		SANDY LEAN CLAY (CL) - mostly low to			SS-1	WOH			WOH	Disturbed from CPT.
		medium plasticity fines, some fine to								
		medium sand, moist to wet, gray, very soft.								
250.0	18.0	SILTY SAND (SM) - mostly fine to		19.4	SS-2	WOH	1	1	2	Disturbed from CPT.
		medium sand, some low to medium								
		plasticity fines, wet, brownish gray, very								
		loose.								
245.0	23.0	FAT CLAY WITH SAND (CH) - mostly		24.8	SS-3	5	7	10	17	Disturbed from CPT.
		medium to high plasticity fines, few fine to								
		medium sands, moist, gray, very stiff.								
240.0	29.0	SANDY FAT CLAY (CH) - mostly medium		30.6	SS-4	9	11	16	27	Disturbed from CPT.
		to high plasticity fines, some fine to medium								
		sand, moist, light tan to white, very stiff.								
235.0	34.0	FAT CLAY (CH) - mostly medium to high		35.6						
		plasticity fines, moist, white, purple, orange,								
		hard.								

## LEGEND

Continued Next Page

## SAMPLER TYPE

## DRILLING METHOD

SS - Split Spoon  
ST - Shelby Tube  
AWG - Rock Core, 1-1/8"

NQ - Rock Core, 1-7/8"  
CU - Cuttings  
CT - Continuous Tube

HSA - Hollow Stem Auger  
CFA - Continuous Flight Augers  
DC - Driving Casing

RW - Rotary Wash  
RC - Rock Core



RBO South Fork Edisto River and Cedar Creek

Aiken County, South Carolina

File #: 2.127B.01, PIN#: 26432, S&amp;ME #: 1611-04-386

## LOG OF BORING No. B-21

Station:

522+22

Offset:

39.5 ft. L of C/L

Date Drilled: 03/02/05

Supervisor: TH

Casing Length: 26.4 ft.

Ground Elevation: 270.0

Hammer Type: ☐ Gravity ☒ Automatic ☐ Other:

Water Level: 14.5 ft. @ TOB. 14 ft. @ 24 hrs.

Drilling Method: DC, RW

Notes:

**Final Boring Log (05/05/05).** BK-51 Drill Rig. Driving casing 0-26.4 ft. Mud rotary with drag bit 26.4-94.1 ft. Artesian pressure encountered.

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	STD. PENETRATION TEST DATA (blows/ft)			
						1st 6"	2nd 6"	3rd 6"	N Value
230.0		- white, pink, purple, orange.		40.6	SS-5	10	17	26	43
44.0		<b>FAT CLAY WITH SAND (CH)</b> - mostly medium to high plasticity fines, few very fine sands, moist, white with purple and orange, hard.		45.6	SS-6	9	16	21	37
225.0									
49.0		<b>FAT CLAY (CH)</b> - mostly medium to high plasticity fines, moist, white, pink, red, orange, hard.		50.6	SS-7	10	19	27	46
220.0									
215.0		- white with pink and orange.		55.6	SS-8	10	19	27	46
210.0		- white with orange.		60.6	SS-9	10	19	28	47
64.0		<b>ELASTIC SILT WITH SAND (MH)</b> - mostly medium plasticity fines, few very fine sands, moist, light tan and purple, very stiff.		65.6	SS-10	9	19	29	48
205.0									
69.0		<b>SILTY SAND (SM)</b> mostly fine to medium sand, some medium plasticity fines, moist, white, dense.		70.6	SS-11	10	11	19	30
200.0									
					SS-12	11	14	19	33

## LEGEND

Continued Next Page

## SAMPLER TYPE

SS - Split Spoon  
ST - Shelby Tube  
AWG - Rock Core, 1-1/8"

NQ - Rock Core, 1-7/8"  
CU - Cuttings  
CT - Continuous Tube

## DRILLING METHOD

HSA - Hollow Stem Auger  
CFA - Continuous Flight Augers  
DC - Driving Casing

RW - Rotary Wash  
RC - Rock Core





RBO South Fork Edisto River and Cedar Creek

Aiken County, South Carolina

File #: 2.127B.01, PIN#: 26432, S&ME #: 1611-04-386

## LOG OF BORING No. B-21

Station:

522+22

Offset:

39.5 ft. L of C/L

Date Drilled: 03/02/05

Supervisor: TH

Casing Length: 26.4 ft.

Ground Elevation: 270.0

Hammer Type: ☐ Gravity ☒ Automatic ☐ Other:

Water Level: 14.5 ft. @ TOB. 14 ft. @ 24 hrs.

Drilling Method: DC, RW

Notes:

**Final Boring Log (05/05/05).** BK-51  
Drill Rig. Driving casing 0-26.4 ft. Mud rotary with drag bit 26.4-94.1 ft. Artesian pressure encountered.

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"			N Value	STD. PENETRATION TEST DATA (blows/ft)				
						1st 6"	2nd 6"	3rd 6"		5	10	20	40	70
195.0	74.0	<b>ELASTIC SILT WITH SAND (MH)</b> - mostly medium to high plasticity fines, few fine sands, moist, light tan to white, very hard.		75.6	SS-13	15	25	28	43					
190.0				80.6	SS-14	13	25	29	44					
185.0	84.0	<b>SILTY SAND (SM)</b> - mostly fine sand, some low plasticity fines, wet, white and purple, dense.		85.6	SS-15	9	14	19	33					
180.0				92.6	SS-16	9	13	18	31					
175.0	94.1	Boring Terminated at 94.1 feet.												

### LEGEND

**SAMPLER TYPE**  
 SS - Split Spoon  
 ST - Shelby Tube  
 AWG - Rock Core, 1-1/8"  
 NQ - Rock Core, 1-7/8"  
 CU - Cuttings  
 CT - Continuous Tube

**DRILLING METHOD**  
 HSA - Hollow Stem Auger  
 CFA - Continuous Flight Augers  
 DC - Driving Casing  
 RW - Rotary Wash  
 RC - Rock Core



RBO South Fork Edisto River and Cedar Creek

Aiken County, South Carolina

File #: 2.127B.01, PIN#: 26432, S&amp;ME #: 1611-04-386

## LOG OF BORING No. B-22

Station:

522+52

Offset:

39.5 ft. L of C/L

Date Drilled: 02/17/05

Supervisor: TH

Casing Length: 30 ft.

Ground Elevation: 270.0

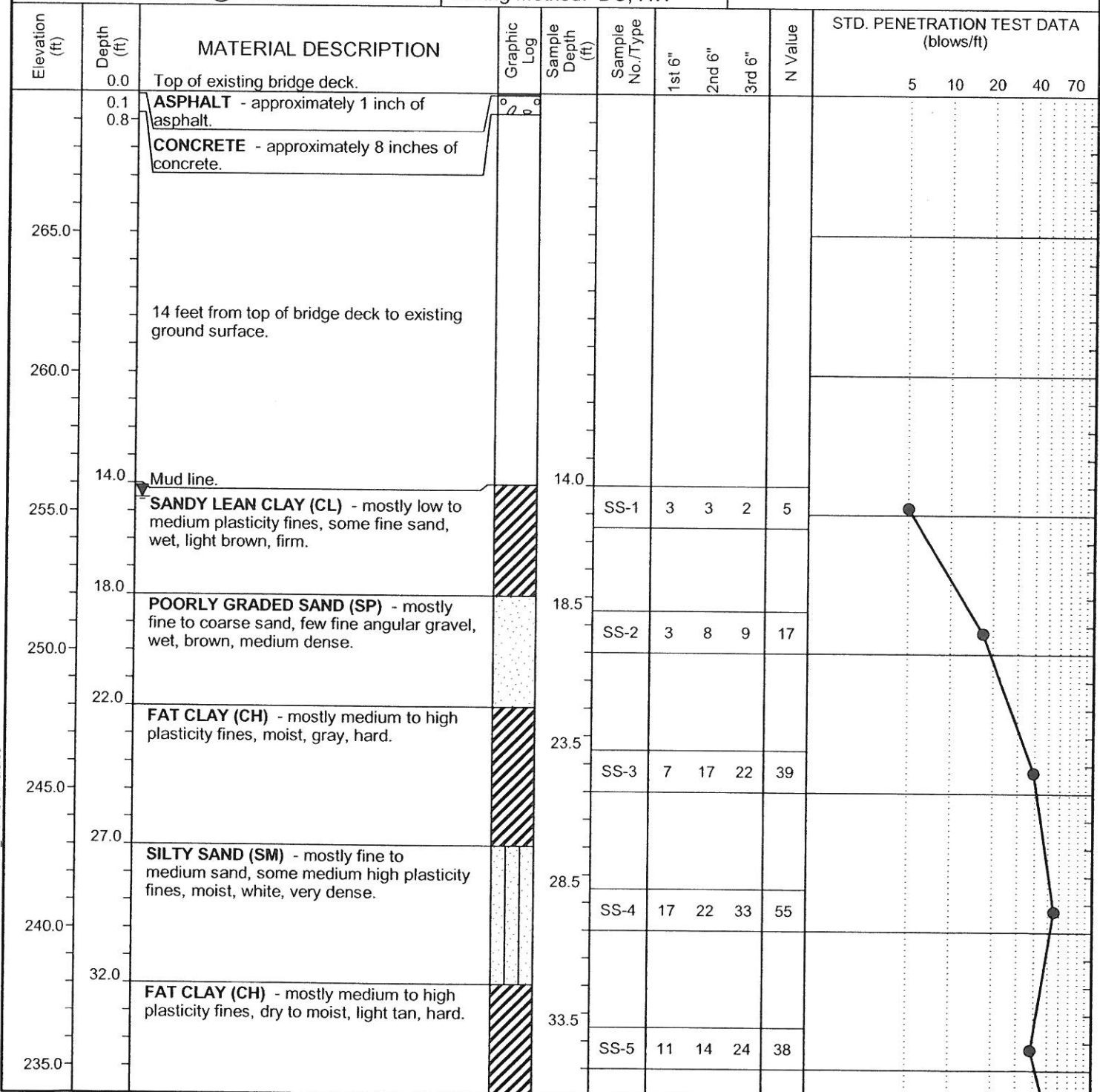
Hammer Type: ☒ Gravity ☐ Automatic ☐ Other:

Water Level: 14.5 ft. @ 24 hrs.

Drilling Method: DC, RW

Notes:

**Final Boring Log (05/05/05).** Mobile B-57 Drill Rig. Driving casing 0-30 ft. Mud rotary with drag bit 30-95 ft. Artesian pressure encountered.



## LEGEND

Continued Next Page

SAMPLER TYPE  
SS - Split Spoon  
ST - Shelby Tube  
AWG - Rock Core, 1-1/8"  
NQ - Rock Core, 1-7/8"  
CU - Cuttings  
CT - Continuous Tube

DRILLING METHOD  
HSA - Hollow Stem Auger  
CFA - Continuous Flight Augers  
DC - Driving Casing  
RW - Rotary Wash  
RC - Rock Core



RBO South Fork Edisto River and Cedar Creek

Aiken County, South Carolina

File #: 2.127B.01, PIN#: 26432, S&amp;ME #: 1611-04-386

## LOG OF BORING No. B-22

Station:

522+52

Offset:

39.5 ft. L of C/L

Date Drilled: 02/17/05

Supervisor: TH

Casing Length: 30 ft.

Ground Elevation: 270.0

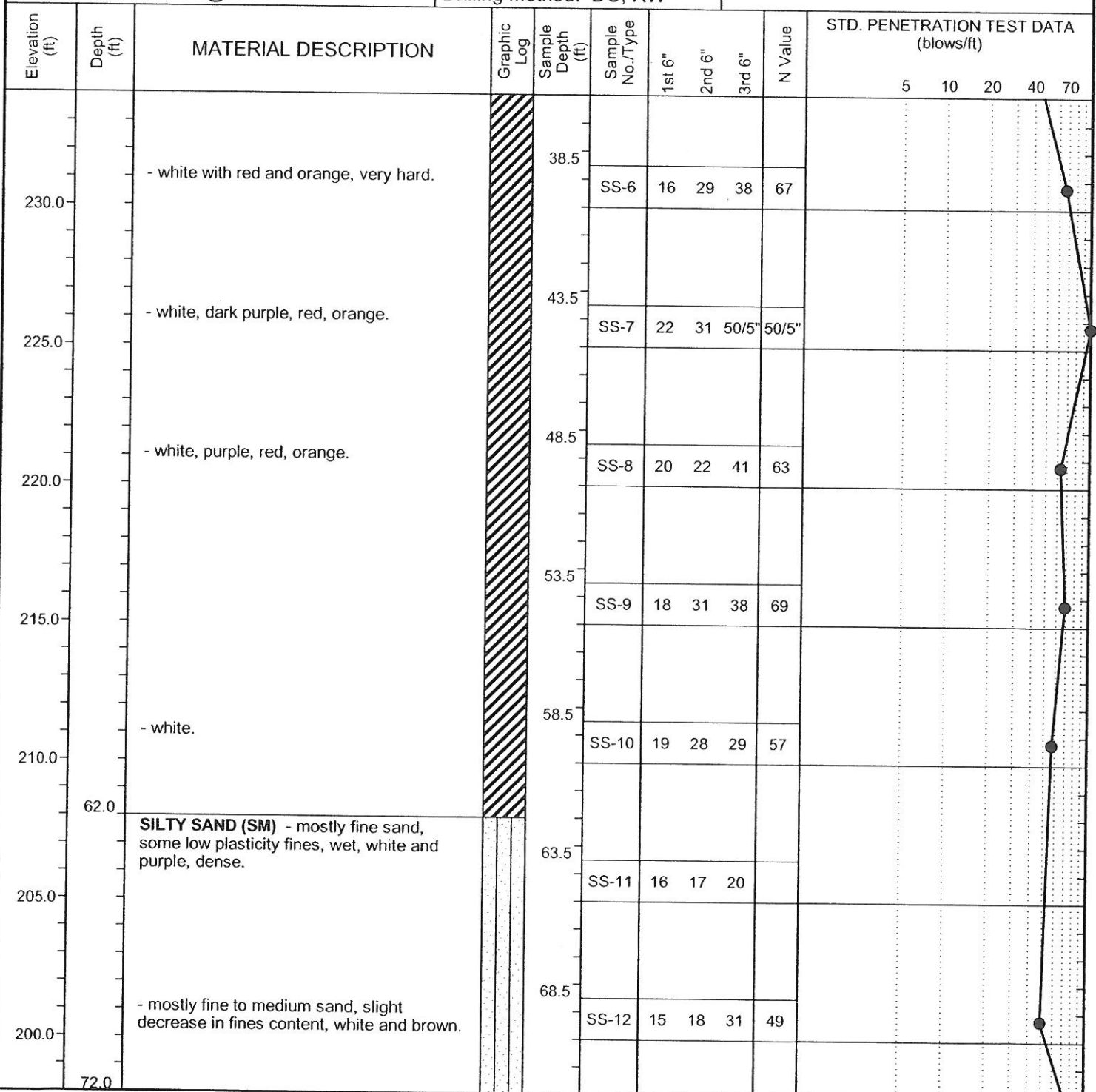
Hammer Type: ☒ Gravity ☐ Automatic ☐ Other:

Water Level: 14.5 ft. @ 24 hrs.

Drilling Method: DC, RW

Notes:

**Final Boring Log (05/05/05).** Mobile B-57 Drill Rig. Driving casing 0-30 ft. Mud rotary with drag bit 30-95 ft. Artesian pressure encountered.



## LEGEND

Continued Next Page

## SAMPLER TYPE

SS - Split Spoon  
ST - Shelby Tube  
AWG - Rock Core, 1-1/8"

NQ - Rock Core, 1-7/8"  
CU - Cuttings  
CT - Continuous Tube

## DRILLING METHOD

HSA - Hollow Stem Auger  
CFA - Continuous Flight Augers  
DC - Driving Casing

RW - Rotary Wash  
RC - Rock Core



RBO South Fork Edisto River and Cedar Creek

Aiken County, South Carolina

File #: 2.127B.01, PIN#: 26432, S&amp;ME #: 1611-04-386

## LOG OF BORING No. B-22

Station:

522+52

Offset:

39.5 ft. L of C/L

Date Drilled: 02/17/05

Supervisor: TH

Casing Length: 30 ft.

Ground Elevation: 270.0

Hammer Type: ☒ Gravity ☐ Automatic ☐ Other:

Water Level: 14.5 ft. @ 24 hrs.

Drilling Method: DC, RW

Notes:

**Final Boring Log (05/05/05).** Mobile B-57 Drill Rig. Driving casing 0-30 ft. Mud rotary with drag bit 30-95 ft. Artesian pressure encountered.

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" 2nd 6" 3rd 6"			N Value	STD. PENETRATION TEST DATA (blows/ft)				
										5	10	20	40	70
195.0		<b>ELASTIC SILT (MH)</b> - mostly medium to high plasticity fines, trace sand, moist, tan, very hard.		73.5	SS-13	22	50/5"	50/5"						
		- red and white.		78.5	SS-14	21	29	36	65					
185.0	82.0	<b>SILTY SAND (SM)</b> - mostly very fine sand, some low to medium plasticity fines, moist, tan, dense.		83.5	SS-15	16	24	21	35					
		- decrease in fines content, white and purple.		88.5	SS-16	15	20	26	46					
175.0	95.0	- increase in fines content, white.		93.5	SS-17	10	21	24	45					
		Boring Terminated at 95 feet.												

## LEGEND

## SAMPLER TYPE

SS - Split Spoon  
ST - Shelby Tube  
AWG - Rock Core, 1-1/8"

NQ - Rock Core, 1-7/8"  
CU - Cuttings  
CT - Continuous Tube

## DRILLING METHOD

HSA - Hollow Stem Auger  
CFA - Continuous Flight Augers  
DC - Driving Casing

RW - Rotary Wash  
RC - Rock Core



RBO South Fork Edisto River and Cedar Creek

Aiken County, South Carolina

File #: 2.127B.01, PIN#: 26432, S&amp;ME #: 1611-04-386

## LOG OF BORING No. B-23

Station:

522+82

Offset:

39 ft. L of C/L

Date Drilled: 02/23/05

Supervisor: TH

Casing Length: 30.4 ft.

Ground Elevation: 270.0

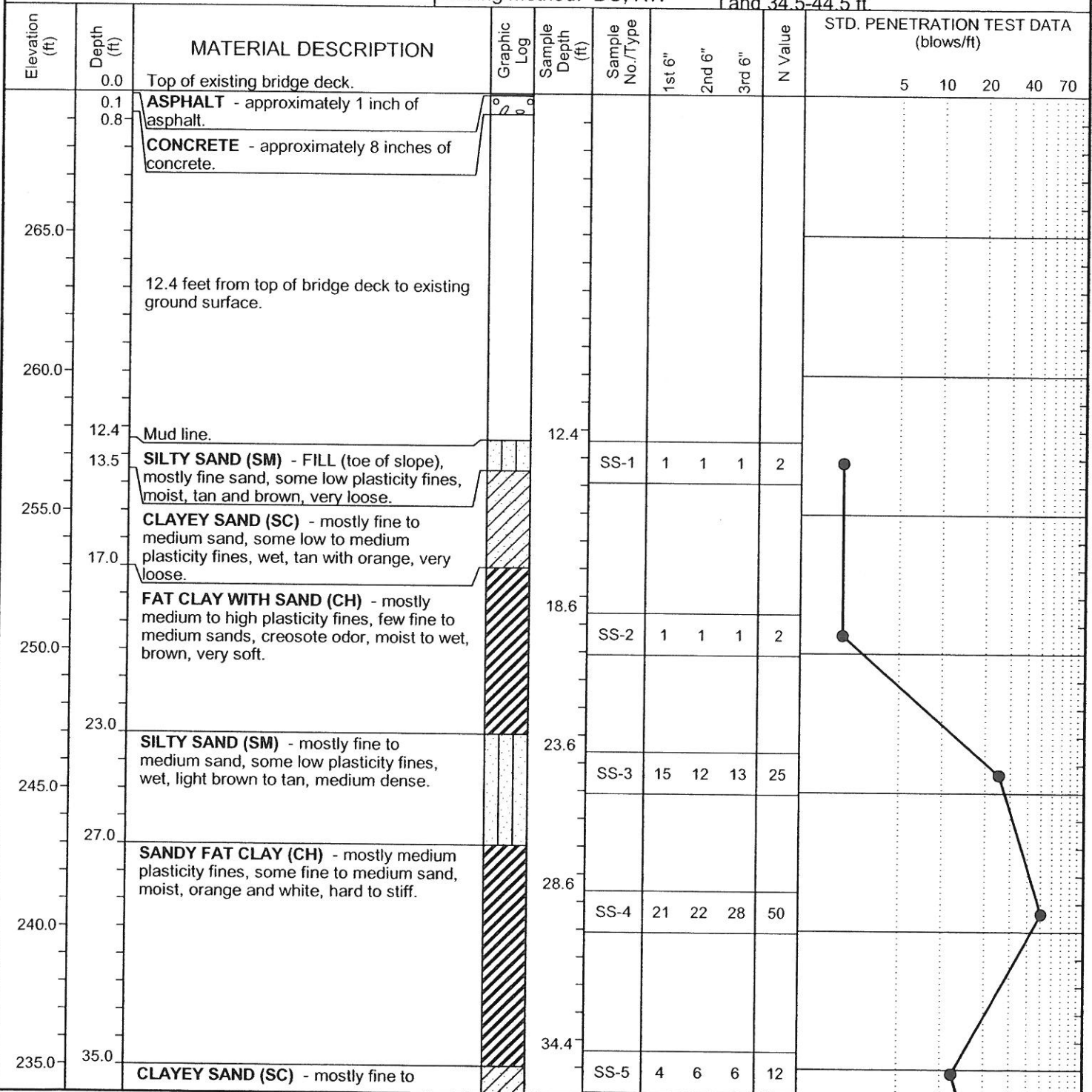
Hammer Type: ☐ Gravity ☒ Automatic ☐ Other:

Water Level:

Drilling Method: DC, RW

Notes:

**Final Boring Log (05/05/05).** BK-51  
Drill Rig. Driving casing 0-30.4 ft. Mud rotary with drag bit 30.4-90.9 ft. Artesian pressure encountered. Creosote odor noted by drilling crew from 23.5-32.5 ft. and 34.5-44.5 ft.



## LEGEND

Continued Next Page

SAMPLER TYPE  
SS - Split Spoon  
ST - Shelby Tube  
AWG - Rock Core, 1-1/8"  
NQ - Rock Core, 1-7/8"  
CU - Cuttings  
CT - Continuous Tube

DRILLING METHOD  
HSA - Hollow Stem Auger  
CFA - Continuous Flight Augers  
DC - Driving Casing  
RW - Rotary Wash  
RC - Rock Core





RBO South Fork Edisto River and Cedar Creek

Aiken County, South Carolina

File #: 2.127B.01, PIN#: 26432, S&ME #: 1611-04-386

## LOG OF BORING No. B-23

Station:

522+82

Offset:

39 ft. L of C/L

Date Drilled: 02/23/05

Supervisor: TH

Casing Length: 30.4 ft.

Ground Elevation: 270.0

Hammer Type: ☐ Gravity ☒ Automatic ☐ Other:

Water Level:

Drilling Method: DC, RW

Notes:

**Final Boring Log (05/05/05).** BK-51 Drill Rig. Driving casing 0-30.4 ft. Mud rotary with drag bit 30.4-90.9 ft. Artesian pressure encountered. Creosote odor noted by drilling crew from 23.5-32.5 ft. and 34.5-44.5 ft.

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	N Value	STD. PENETRATION TEST DATA (blows/ft)
										5 10 20 40 70
230.0	40.0	medium sand, some medium plasticity fines, wet, white and purple, medium dense.		39.4						
		<b>FAT CLAY WITH SAND (CH)</b> - mostly medium to high plasticity fines, few fine sands, moist, white and red, very stiff to hard.			SS-6	7	9	14	23	
225.0				44.4						
					SS-7	10	17	24	41	
220.0		- white, purple, orange.		49.4						
					SS-8	11	19	26	45	
215.0				54.4						
					SS-9	9	20	27	47	
210.0		- white and orange, hard to very stiff.		59.4						
					SS-10	9	14	19	33	
205.0	65.5	<b>SILTY SAND (SM)</b> - mostly fine sand, some low to medium plasticity fines, moist, white and purple, medium dense.		64.4						
					SS-11	9	11	16	27	
200.0		- mostly fine to medium sand.		69.4						
					SS-12	8	11	16	27	

### LEGEND

Continued Next Page

#### SAMPLER TYPE

#### DRILLING METHOD

SS - Split Spoon  
ST - Shelby Tube  
AWG - Rock Core, 1-1/8"

NQ - Rock Core, 1-7/8"  
CU - Cuttings  
CT - Continuous Tube

HSA - Hollow Stem Auger  
CFA - Continuous Flight Augers  
DC - Driving Casing

RW - Rotary Wash  
RC - Rock Core



RBO South Fork Edisto River and Cedar Creek

Aiken County, South Carolina

File #: 2.127B.01, PIN#: 26432, S&amp;ME #: 1611-04-386

## LOG OF BORING No. B-23

Station:

522+82

Offset:

39 ft. L of C/L

Date Drilled: 02/23/05

Supervisor: TH

Casing Length: 30.4 ft.

Ground Elevation: 270.0

Hammer Type: ☐ Gravity ☒ Automatic ☐ Other:

Water Level:

Drilling Method: DC, RW

Notes:

**Final Boring Log (05/05/05).** BK-51  
Drill Rig. Driving casing 0-30.4 ft. Mud  
rotary with drag bit 30.4-90.9 ft. Artesian  
pressure encountered. Creosote odor  
noted by drilling crew from 23.5-32.5 ft.  
and 34.5-44.5 ft.

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	N Value	STD. PENETRATION TEST DATA (blows/ft)				
										5	10	20	40	70
72.5		<b>ELASTIC SILT (MH)</b> - mostly medium to high plasticity fines, moist, light tan, very stiff.		74.4										
195.0					SS-13	7	11	17	28					
190.0		- red and light tan, hard.		79.4										
					SS-14	11	17	22	39					
185.0				84.4										
					SS-15	11	15	22	37					
87.0		- white and purple.												
		<b>SILTY SAND (SM)</b> - mostly fine sand, some low to medium plasticity fines, moist, white, medium dense.		89.4										
180.0					SS-16	7	11	17	28					
90.9		Boring Terminated at 90.9 feet.												
175.0														
170.0														
165.0														

## LEGEND


SS - Split Spoon  
ST - Shelby Tube  
AWG - Rock Core, 1-1/8"

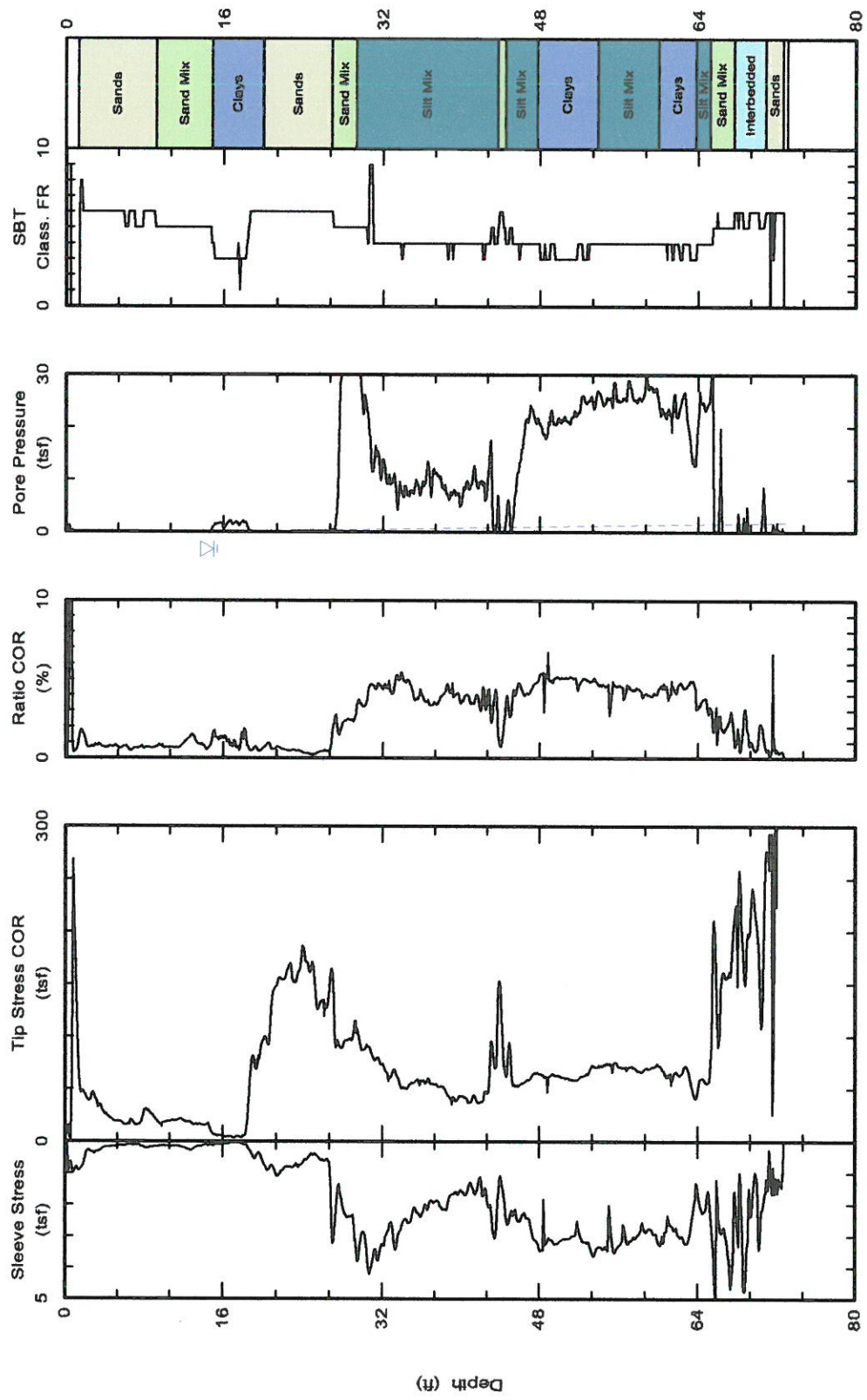
## SAMPLER TYPE

NQ - Rock Core, 1-7/8"  
CU - Cuttings  
CT - Continuous Tube

## DRILLING METHOD

HSA - Hollow Stem Auger  
CFA - Continuous Flight Augers  
DC - Driving Casing  
RW - Rotary Wash  
RC - Rock Core

 <b>S&amp;ME, Inc.</b> (843) 884-0005 620 Wando Park Boulevard Mt. Pleasant, SC 29464 <a href="http://www.smeinc.com">www.smeinc.com</a>	Station: 523+12 Offset: 39' L Surface Elevation: +270 Client: N/A Job Site: SC 4 Bridge over Edisto River	Date: 28/Feb/2005 Test ID: B-24 Project: 1611-04-386
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Class FR: Friction Ratio Classification (Ref: Robertson 1990)  
 ▽ Estimated Phreatic Surface



RBO South Fork Edisto River and Cedar Creek

Aiken County, South Carolina

File #: 2.127B.01, PIN#: 26432, S&ME #: 1611-04-386

## LOG OF BORING No. B-25

Station:

527+00

Offset:

39 ft. L of C/L

Date Drilled: 02/18/05

Supervisor: TH

Casing Length: N/A

Ground Elevation: 270.0

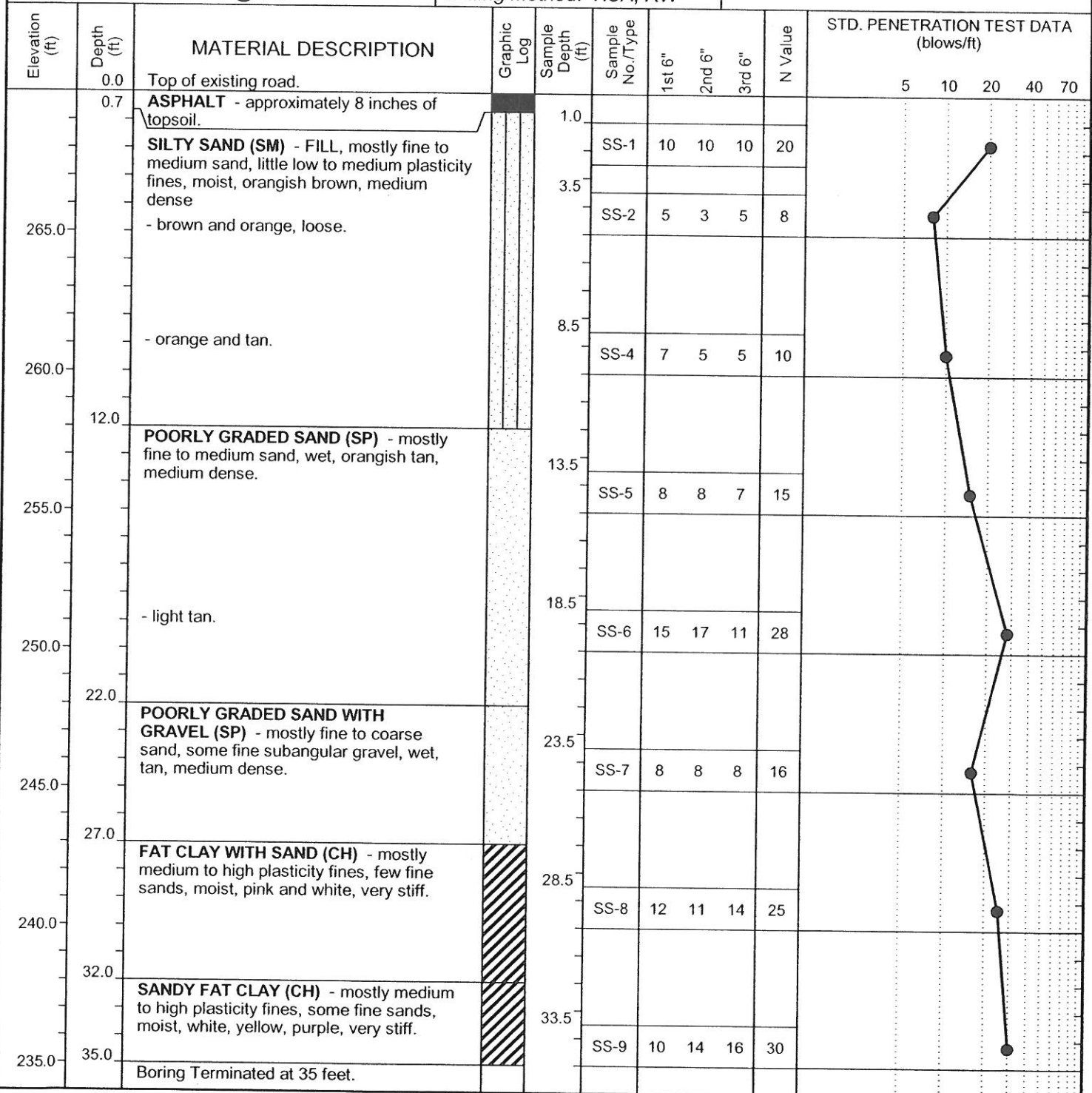
Hammer Type: ☒ Gravity ☐ Automatic ☐ Other:

Water Level: Hole cave @ 4 ft.

Drilling Method: HSA, RW

Notes:

**Final Boring Log (05/05/05).** Mobile B-57 Drill Rig. Hollow stem auger 0-10 ft. Mud rotary with drag bit 10-35 ft.



### LEGEND

**SAMPLER TYPE**  
 SS - Split Spoon  
 ST - Shelby Tube  
 AWG - Rock Core, 1-1/8"  
 NQ - Rock Core, 1-7/8"  
 CU - Cuttings  
 CT - Continuous Tube

**DRILLING METHOD**  
 HSA - Hollow Stem Auger  
 CFA - Continuous Flight Augers  
 DC - Driving Casing  
 RW - Rotary Wash  
 RC - Rock Core





RBO South Fork Edisto River and Cedar Creek

Aiken County, South Carolina

File #: 2.127B.01, PIN#: 26432, S&ME #: 1611-04-386

## LOG OF BORING No. B-26

Station:

530+00

Offset:

39 ft. L of C/L

Date Drilled: 02/18/05

Supervisor: TH

Casing Length: N/A

Ground Elevation: 270.0

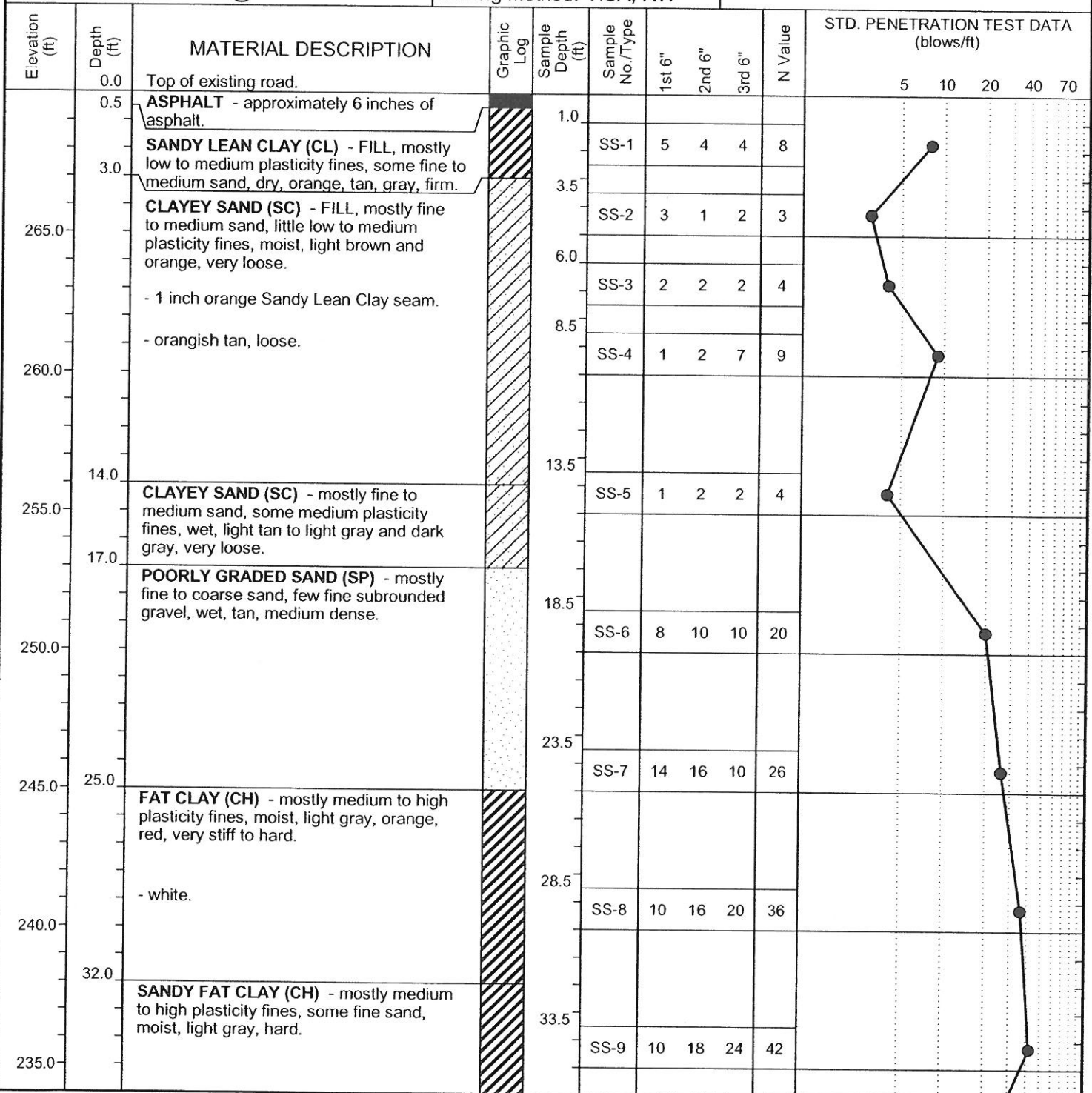
Hammer Type: ☐ Gravity ☒ Automatic ☐ Other:

Water Level: Hole cave @ 6 ft.

Drilling Method: HSA, RW

Notes:

**Final Boring Log (05/05/05).** BK-51  
Drill Rig. Hollow stem auger 0-10 ft.  
Mud rotary with drag bit 10-40 ft.



### LEGEND

Continued Next Page

SAMPLER TYPE			DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"		HSA - Hollow Stem Auger	RW - Rotary Wash
ST - Shelby Tube	CU - Cuttings		CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube		DC - Driving Casing	





RBO South Fork Edisto River and Cedar Creek

Aiken County, South Carolina

File #: 2.127B.01, PIN#: 26432, S&amp;ME #: 1611-04-386

## LOG OF BORING No. B-26

Station:

530+00

Offset:

39 ft. L of C/L

Date Drilled: 02/18/05

Supervisor: TH

Casing Length: N/A

Ground Elevation: 270.0

Hammer Type: ☐ Gravity ☒ Automatic ☐ Other:

Water Level: Hole cave @ 6 ft.

Drilling Method: HSA, RW

Notes:

**Final Boring Log (05/05/05).** BK-51  
Drill Rig. Hollow stem auger 0-10 ft.  
Mud rotary with drag bit 10-40 ft.

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" 2nd 6" 3rd 6"			N Value	STD. PENETRATION TEST DATA (blows/ft)				
						1st 6"	2nd 6"	3rd 6"		5	10	20	40	70
	37.0													
		<b>SILTY SAND (SM)</b> - mostly fine sand, some low to medium plasticity fines, moist, light gray, medium dense.		38.5										
230.0	40.0	Boring Terminated at 40 feet.			SS-10	4	6	10	16					
225.0														
220.0														
215.0														
210.0														
205.0														
200.0														

## LEGEND

## SAMPLER TYPE

SS - Split Spoon  
ST - Shelby Tube  
AWG - Rock Core, 1-1/8"

NQ - Rock Core, 1-7/8"  
CU - Cuttings  
CT - Continuous Tube

## DRILLING METHOD

HSA - Hollow Stem Auger  
CFA - Continuous Flight Augers  
DC - Driving Casing

RW - Rotary Wash  
RC - Rock Core



RBO South Fork Edisto River and Cedar Creek

Aiken County, South Carolina

File #: 2.127B.01, PIN#: 26432, S&amp;ME #: 1611-04-386

## LOG OF BORING No. B-27

Station:

532+00

Offset:

10.5 ft. R of C/L

Date Drilled: 02/25/05

Supervisor: TH

Casing Length: N/A

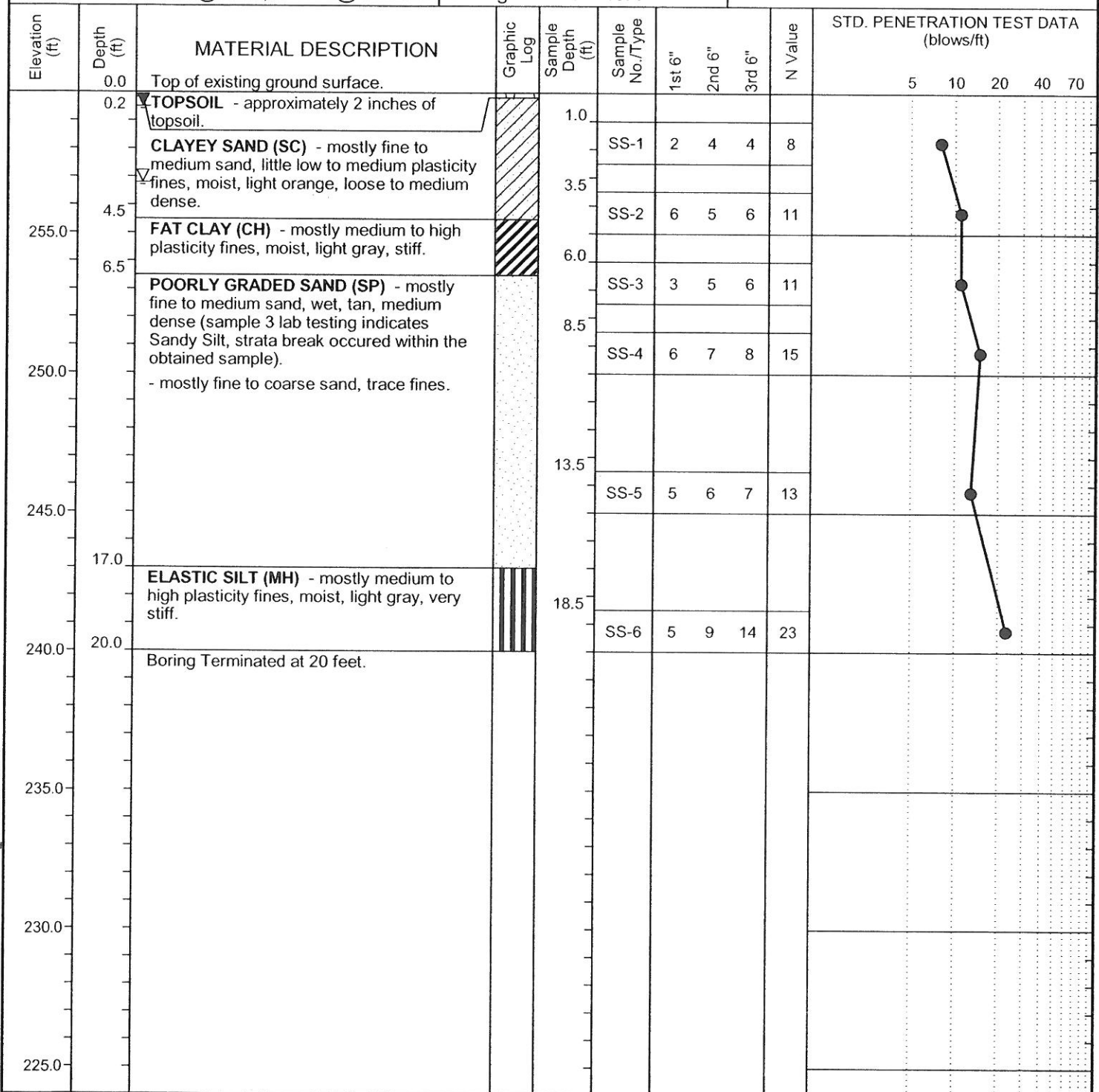
Ground Elevation: 260.0

Hammer Type: ☐ Gravity ☒ Automatic ☐ Other:

Water Level: 3.2 ft. @ TOB, 0.5 ft. @ 24 hrs.

Drilling Method: HSA

Notes:

Final Boring Log (05/05/05). BK-51  
Drill Rig.

## LEGEND

SAMPLER TYPE

SS - Split Spoon NQ - Rock Core, 1-7/8"

ST - Shelby Tube CU - Cuttings

AWG - Rock Core, 1-1/8" CT - Continuous Tube

DRILLING METHOD

HSA - Hollow Stem Auger RW - Rotary Wash

CFA - Continuous Flight Augers RC - Rock Core

DC - Driving Casing



RBO South Fork Edisto River and Cedar Creek

Aiken County, South Carolina

File #: 2.127B.01, PIN#: 26432, S&amp;ME #: 1611-04-386

## LOG OF BORING No. B-28

Station:

536+00

Offset:

10.5 ft. R of C/L

Date Drilled: 02/24/05

Supervisor: TH

Notes:

Final Boring Log (05/05/05). BK-51  
Drill Rig.

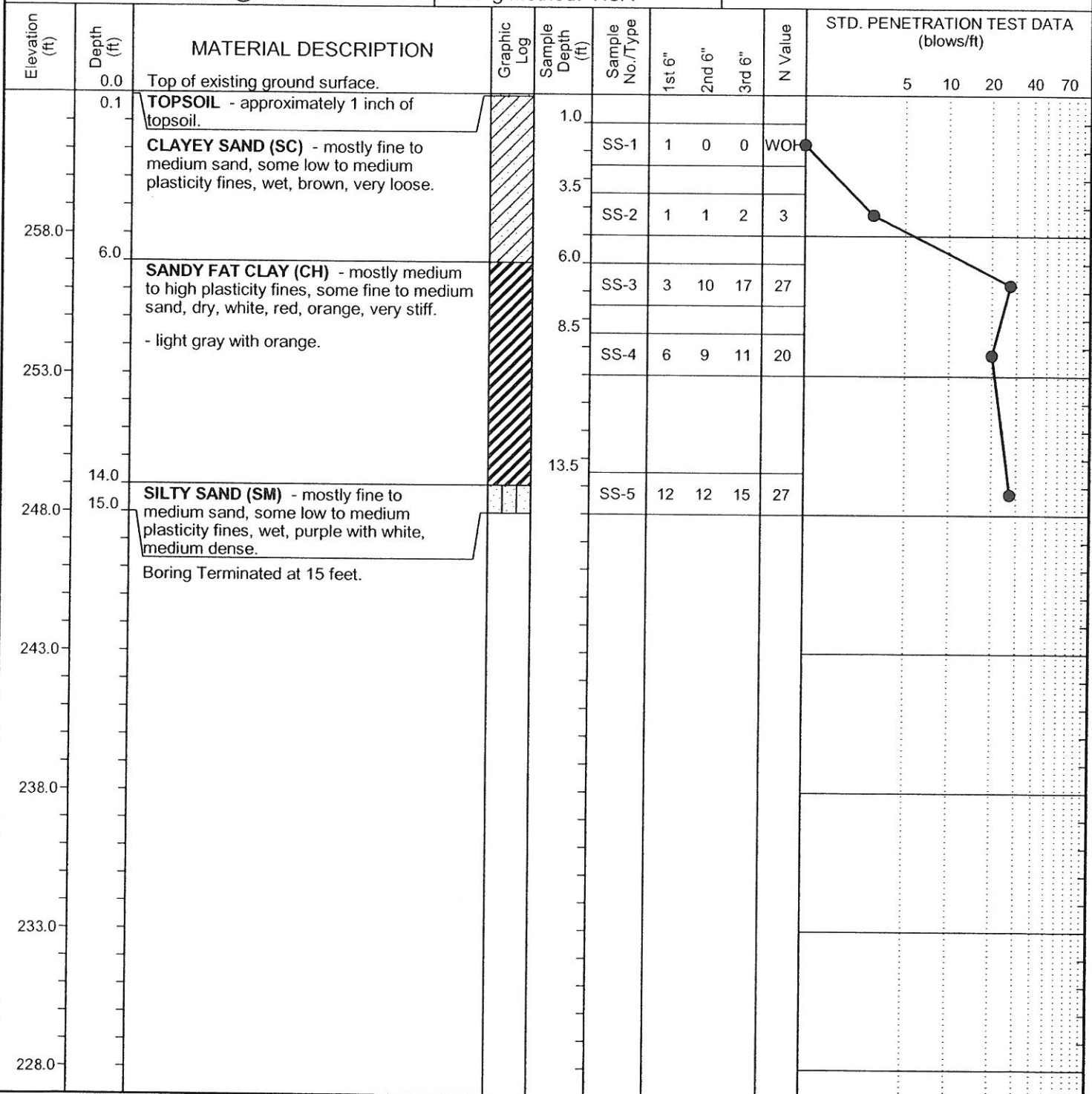
Casing Length: N/A

Ground Elevation: 263.0

Hammer Type: ☐ Gravity ☒ Automatic ☐ Other:

Water Level: Hole cave @ 1 ft.

Drilling Method: HSA



## LEGEND

## SAMPLER TYPE

SS - Split Spoon  
ST - Shelby Tube  
AWG - Rock Core, 1-1/8"

NQ - Rock Core, 1-7/8"  
CU - Cuttings  
CT - Continuous Tube

## DRILLING METHOD

HSA - Hollow Stem Auger  
CFA - Continuous Flight Augers  
DC - Driving Casing

RW - Rotary Wash  
RC - Rock Core



RBO South Fork Edisto River and Cedar Creek

Aiken County, South Carolina

File #: 2.127B.01, PIN#: 26432, S&amp;ME #: 1611-04-386

## LOG OF BORING No. B-29

Station:

538+00

Offset:

38 ft. L of C/L

Date Drilled: 03/04/05

Supervisor: TH

Casing Length: N/A

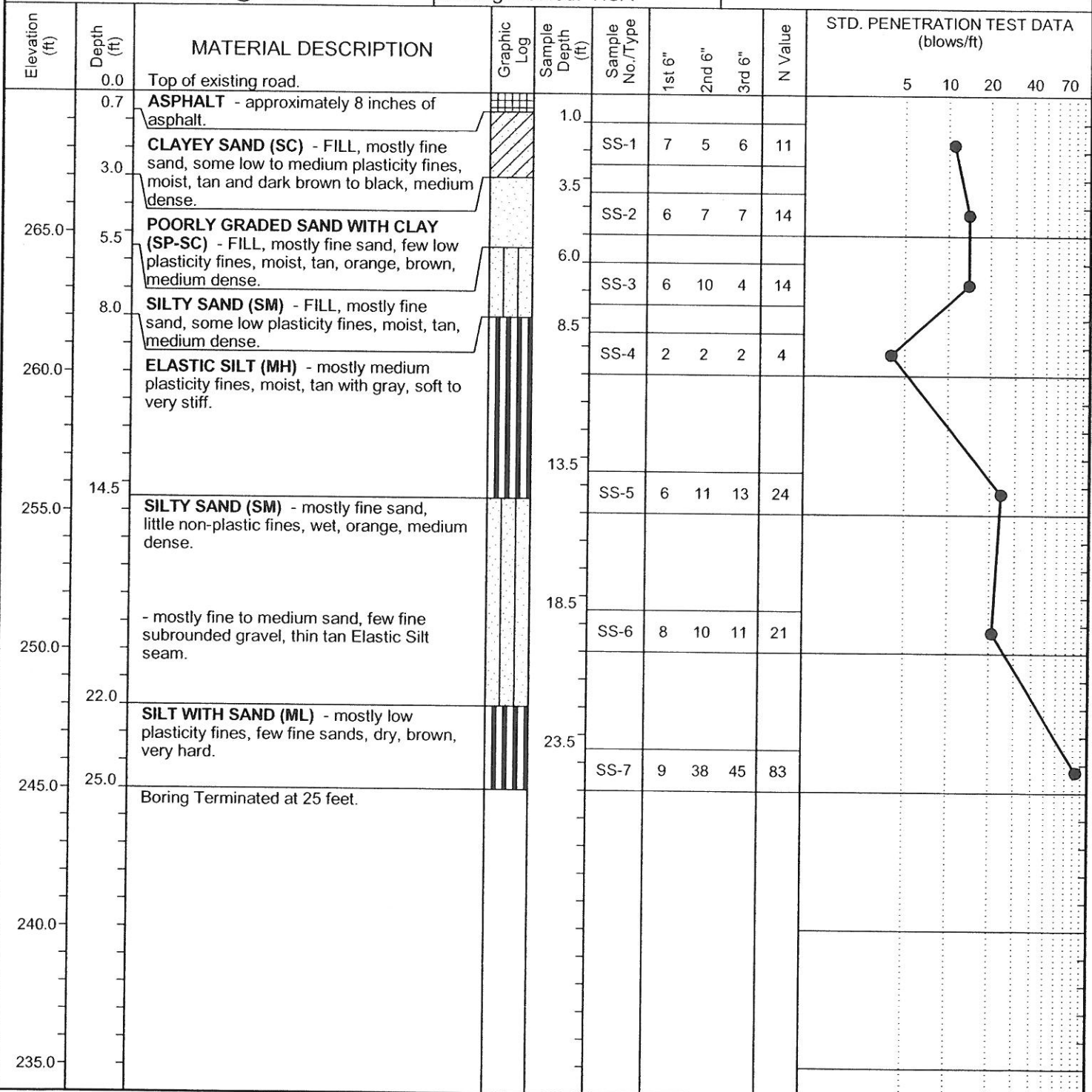
Ground Elevation: 270.0

Hammer Type: ☐ Gravity ☒ Automatic ☐ Other:

Water Level: Hole cave @ 12.3 ft.


Drilling Method: HSA

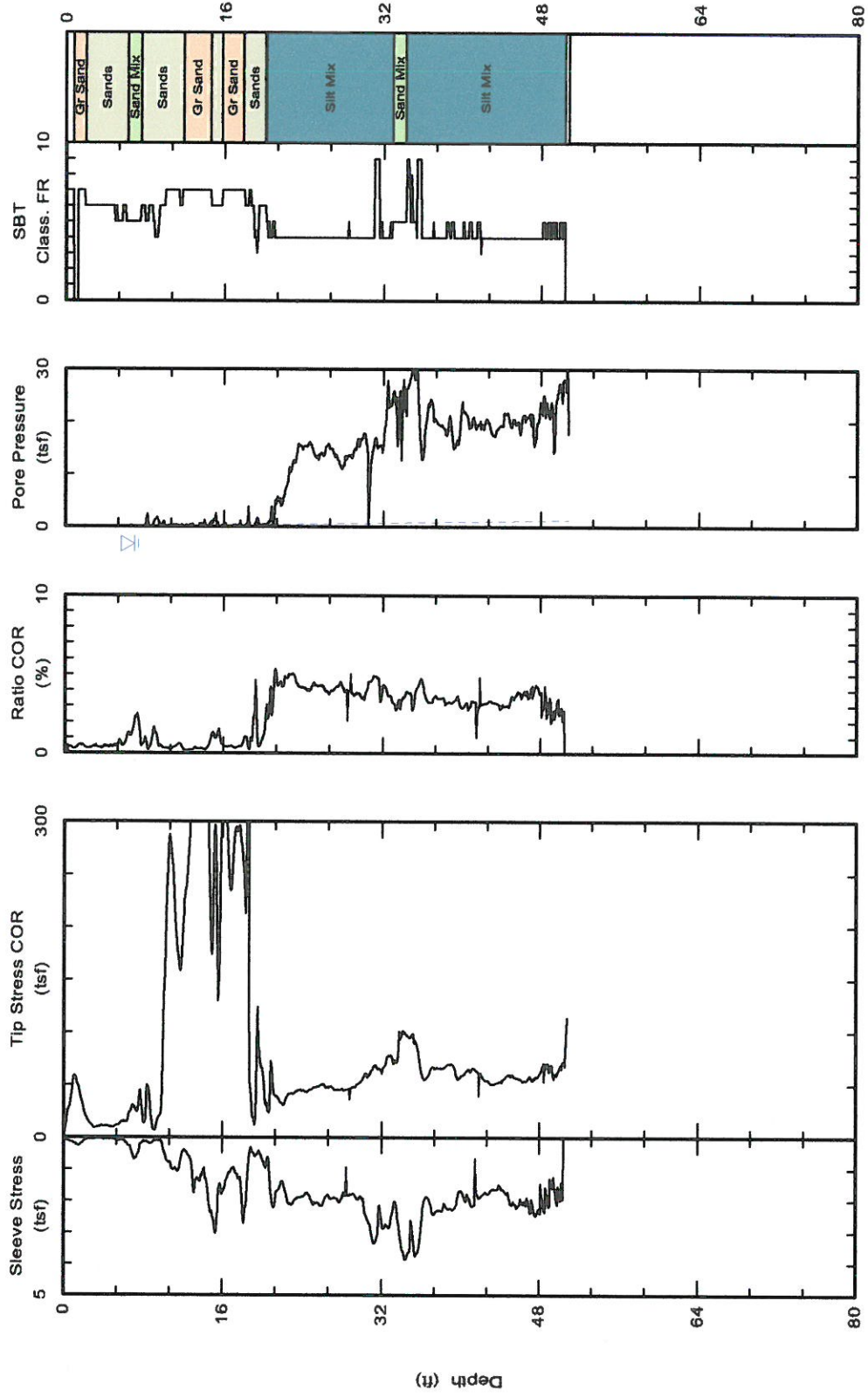
Notes:

Final Boring Log (05/05/05). BK-51  
Drill Rig.

## LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
ST - Shelby Tube	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

 <b>S&amp;ME, Inc.</b> (843) 884-0005 620 Wando Park Boulevard Mt. Pleasant, SC 29464 <a href="http://www.smeinc.com">www.smeinc.com</a>	<b>Station:</b> 541+00 <b>Offset:</b> 0 <b>Surface Elevation:</b> +265 <b>Client:</b> N/A <b>Job Site:</b> SC 4 Bridge over Edisto River	<b>Date:</b> 28/Feb/2005 <b>Test ID:</b> B-30 <b>Project:</b> 1611-04-386



Class FR: Friction Ratio Classification (Ref: Robertson 1990)

▽ Estimated Phreatic Surface



**RBO South Fork Edisto River and Cedar Creek****Aiken County, South Carolina****File #: 2.127B.01, PIN#: 26432, S&ME #: 1611-04-386****LOG OF BORING No. B-31**

Station:

541+80

Offset:

38.5 ft. L of C/L

Date Drilled: 03/03/05

Supervisor: TH

Casing Length: 30 ft.

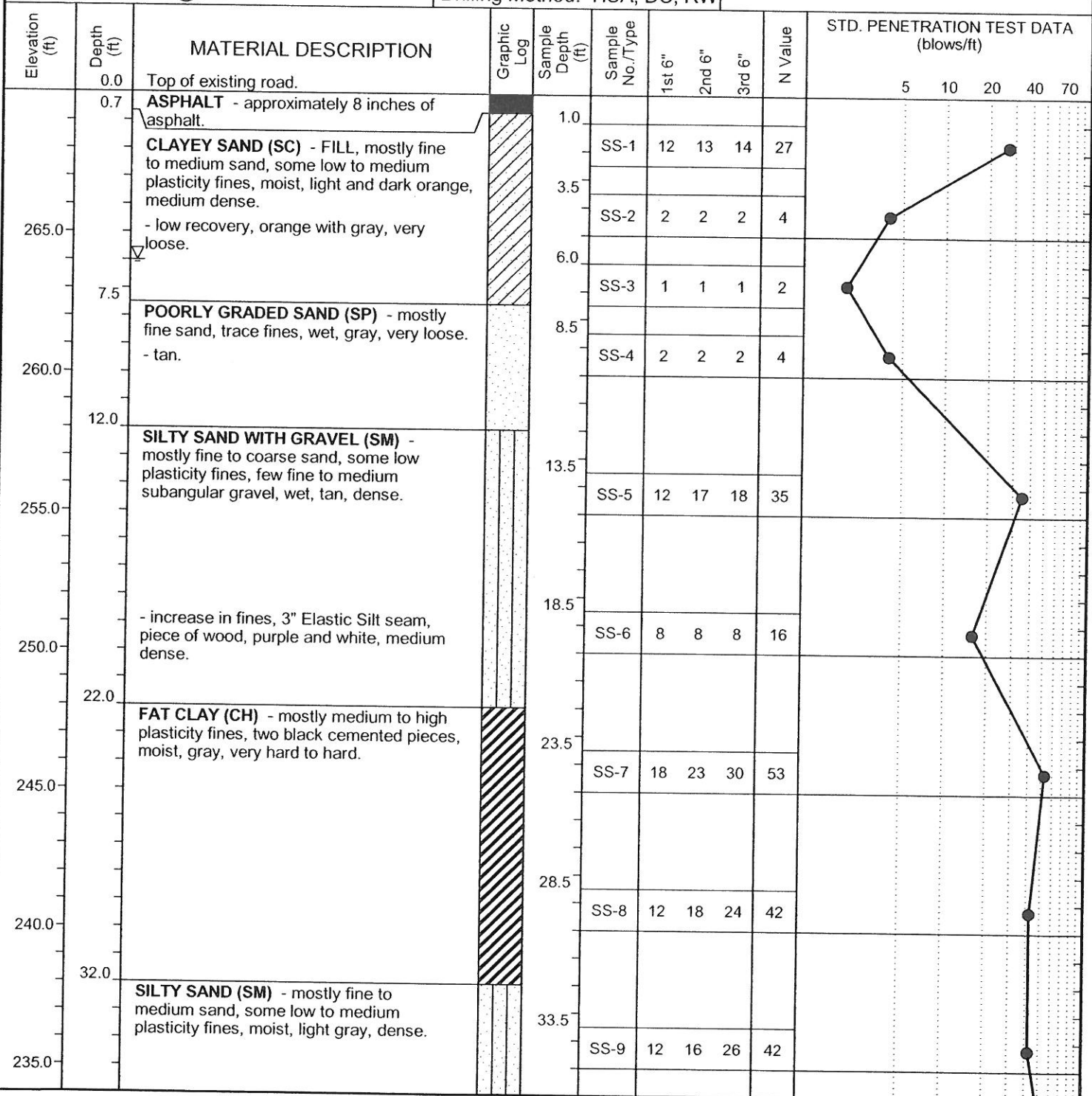
Ground Elevation: 270.0

Hammer Type: ☒ Gravity ☐ Automatic ☐ Other:

Water Level: 6 ft. @ TOB.

Drilling Method: HSA, DC, RW

Notes:

**Final Boring Log (05/05/05).** Mobile B-57 Drill Rig. HSA 0-10 ft. Driving casing 0-30 ft. Mud rotary with drag bit 30-85 ft.**LEGEND***Continued Next Page***SAMPLER TYPE****DRILLING METHOD**

SS - Split Spoon  
ST - Shelby Tube  
AWG - Rock Core, 1-1/8"

NQ - Rock Core, 1-7/8"  
CU - Cuttings  
CT - Continuous Tube

HSA - Hollow Stem Auger  
CFA - Continuous Flight Augers  
DC - Driving Casing

RW - Rotary Wash  
RC - Rock Core



RBO South Fork Edisto River and Cedar Creek

Aiken County, South Carolina

File #: 2.127B.01, PIN#: 26432, S&amp;ME #: 1611-04-386

## LOG OF BORING No. B-31

Station:

541+80

Offset:

38.5 ft. L of C/L

Date Drilled: 03/03/05

Supervisor: TH

Casing Length: 30 ft.

Ground Elevation: 270.0

Hammer Type: ☒ Gravity ☐ Automatic ☐ Other:

Water Level: 6 ft. @ TOB.

Drilling Method: HSA, DC, RW

Notes:

**Final Boring Log (05/05/05).** Mobile B-57 Drill Rig. HSA 0-10 ft. Driving casing 0-30 ft. Mud rotary with drag bit 30-85 ft.

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	N Value	STD. PENETRATION TEST DATA (blows/ft)				
										5	10	20	40	70
37.0		<b>FAT CLAY WITH SAND (CH)</b> - mostly medium to high plasticity fines, few fine sands, moist, white, very hard. (low recovery)												
230.0				38.5	SS-10	17	23	38	61					
		- pink, orange, white, red.												
225.0				43.5	SS-11	18	32	40	72					
		- gray and orange.												
220.0				48.5	SS-12	21	29	38	67					
52.0		<b>SILTY SAND (SM)</b> - mostly very fine sand, some low to medium plasticity fines, moist, white, very dense.		53.5	SS-13	17	23	41	64					
215.0														
57.0		<b>ELASTIC SILT (MH)</b> - mostly medium to high plasticity fines, moist, light gray, red, orange, purple, very hard.		58.5	SS-14	21	35	50	85					
210.0														
62.0		<b>SILTY SAND (SM)</b> - mostly fine sand, some low to medium plasticity fines, wet, white with purple, very dense.		63.5	SS-15	21	24	30	54					
205.0														
69.0		<b>SANDY ELASTIC SILT (MH)</b> - mostly medium plasticity fines, some very fine sand, moist, white and purple, very hard.		68.5	SS-16	19	25	44	69					
200.0														
72.0														

## LEGEND

Continued Next Page

## SAMPLER TYPE

SS - Split Spoon  
ST - Shelby Tube  
AWG - Rock Core, 1-1/8"

NQ - Rock Core, 1-7/8"  
CU - Cuttings  
CT - Continuous Tube

## DRILLING METHOD

HSA - Hollow Stem Auger  
CFA - Continuous Flight Augers  
DC - Driving Casing

RW - Rotary Wash  
RC - Rock Core



RBO South Fork Edisto River and Cedar Creek

Aiken County, South Carolina

File #: 2.127B.01, PIN#: 26432, S&amp;ME #: 1611-04-386

## LOG OF BORING No. B-31

Station:

541+80

Offset:

38.5 ft. L of C/L

Date Drilled: 03/03/05

Supervisor: TH

Casing Length: 30 ft.

Ground Elevation: 270.0

Hammer Type: ☒ Gravity ☐ Automatic ☐ Other:

Water Level: 6 ft. @ TOB.

Drilling Method: HSA, DC, RW

Notes:

**Final Boring Log (05/05/05).** Mobile B-57 Drill Rig. HSA 0-10 ft. Driving casing 0-30 ft. Mud rotary with drag bit 30-85 ft.

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	N Value	STD. PENETRATION TEST DATA (blows/ft)				
										5	10	20	40	70
195.0	77.0	<b>SILTY SAND (SM)</b> - mostly fine to medium sand, some low to medium plasticity fines, moist, white, red, and purple, very dense.		73.5	SS-17	18	35	46	81					
190.0		<b>ELASTIC SILT (MH)</b> - mostly medium to high plasticity fines, moist, white, red, light brown, very hard.		78.5	SS-18	22	31	38	69					
185.0	85.0	- light gray and brownish orange.		83.5	SS-19	28	44	50/5"	50/5"					
		Boring Terminated at 85 feet.												
180.0														
175.0														
170.0														
165.0														

## LEGEND

## SAMPLER TYPE

SS - Split Spoon  
ST - Shelby Tube  
AWG - Rock Core, 1-1/8"

NQ - Rock Core, 1-7/8"  
CU - Cuttings  
CT - Continuous Tube

## DRILLING METHOD

HSA - Hollow Stem Auger  
CFA - Continuous Flight Augers  
DC - Driving Casing

RW - Rotary Wash  
RC - Rock Core



RBO South Fork Edisto River and Cedar Creek

Aiken County, South Carolina

File #: 2.127B.01, PIN#: 26432, S&amp;ME #: 1611-04-386

## LOG OF BORING No. B-32

Station:

542+20

Offset:

38 ft. L of C/L

Date Drilled: 03/03/05

Supervisor: TH

Casing Length: 30.4 ft.

Ground Elevation: 270.0

Hammer Type: ☐ Gravity ☒ Automatic ☐ Other:

Water Level: 9.8 ft. @ TOB. 9.8 ft. @ 24 hrs.

Drilling Method: DC, RW

Notes:

**Final Boring Log (05/05/05). BK-51**  
Drill Rig. Driving casing 0-30.4 ft. Mud rotary with drag bit 30.4-90.9 ft. Artesian pressure encountered.

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	N Value	STD. PENETRATION TEST DATA (blows/ft)				
	0.0	Top of existing bridge deck.								5	10	20	40	70
	0.2	ASPHALT - approximately 2 inches of asphalt.												
	0.8	CONCRETE - approximately 8 inches of concrete.												
265.0														
		12 feet from top of bridge deck to existing ground surface.												
260.0														
	12.0	Mud line.		12.0										
		POORLY GRADED SAND WITH SILT (SP-SM) - mostly fine to medium sand, few low plasticity fines, trace subangular gravel, saturated, tan, very loose.			SS-1	1	0	1	1					
255.0														
	17.0	FAT CLAY (CH) - mostly medium to high plasticity fines, moist, purple with white and orange, firm.		18.6										
250.0					SS-2	3	4	4	8					
		- gray, very stiff.		23.6										
245.0					SS-3	5	10	15	25					
	27.0	SANDY LEAN CLAY (CL) - mostly medium plasticity fines, some fine sand, moist, gray, very stiff.		29.4										
240.0					SS-4	5	10	18	28					
	34.0	SILTY SAND (SM) - mostly fine sand, some low to medium plasticity fines, moist to wet, gray, dense.		34.4										
235.0					SS-5	11	17	17	34					

## LEGEND

Continued Next Page

SAMPLER TYPE  
SS - Split Spoon  
ST - Shelby Tube  
AWG - Rock Core, 1-1/8"  
NQ - Rock Core, 1-7/8"  
CU - Cuttings  
CT - Continuous Tube

DRILLING METHOD  
HSA - Hollow Stem Auger  
CFA - Continuous Flight Augers  
DC - Driving Casing  
RW - Rotary Wash  
RC - Rock Core



RBO South Fork Edisto River and Cedar Creek

Aiken County, South Carolina

File #: 2.127B.01, PIN#: 26432, S&amp;ME #: 1611-04-386

## LOG OF BORING No. B-32

Station:

542+20

Offset:

38 ft. L of C/L

Date Drilled: 03/03/05

Supervisor: TH

Casing Length: 30.4 ft.

Ground Elevation: 270.0

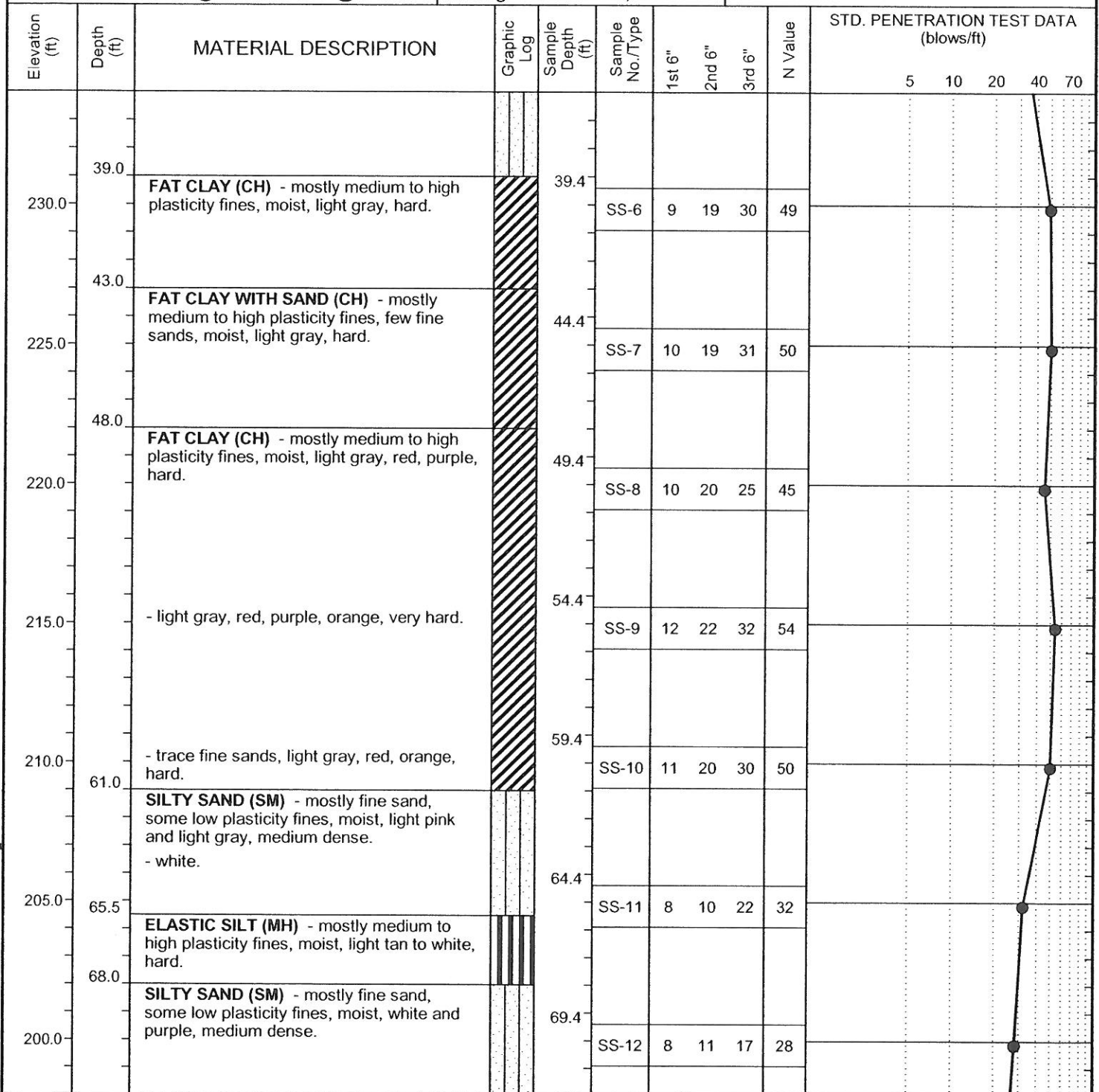
Hammer Type: ☐ Gravity ☒ Automatic ☐ Other:

Water Level: 9.8 ft. @ TOB. 9.8 ft. @ 24 hrs.

Drilling Method: DC, RW

Notes:

**Final Boring Log (05/05/05).** BK-51  
Drill Rig. Driving casing 0-30.4 ft. Mud  
rotary with drag bit 30.4-90.9 ft. Artesian  
pressure encountered.



## LEGEND

Continued Next Page

## SAMPLER TYPE

SS - Split Spoon  
ST - Shelby Tube  
AWG - Rock Core, 1-1/8"

NQ - Rock Core, 1-7/8"  
CU - Cuttings  
CT - Continuous Tube

## DRILLING METHOD

HSA - Hollow Stem Auger  
CFA - Continuous Flight Augers  
DC - Driving Casing

RW - Rotary Wash  
RC - Rock Core





RBO South Fork Edisto River and Cedar Creek

Aiken County, South Carolina

File #: 2.127B.01, PIN#: 26432, S&amp;ME #: 1611-04-386

## LOG OF BORING No. B-32

Station:

542+20

Offset:

38 ft. L of C/L

Date Drilled: 03/03/05

Supervisor: TH

Casing Length: 30.4 ft.

Ground Elevation: 270.0

Hammer Type: ☐ Gravity ☒ Automatic ☐ Other:

Water Level: 9.8 ft. @ TOB. 9.8 ft. @ 24 hrs.

Drilling Method: DC, RW

Notes:

**Final Boring Log (05/05/05).** BK-51  
Drill Rig. Driving casing 0-30.4 ft. Mud  
rotary with drag bit 30.4-90.9 ft. Artesian  
pressure encountered.

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	N Value	STD. PENETRATION TEST DATA (blows/ft)				
										5	10	20	40	70
195.0	78.0	<b>ELASTIC SILT (MH)</b> - mostly medium to high plasticity fines, trace fine sands, moist, light gray to white, hard.  - light tan and orange, very hard.		74.4	SS-13	4	8	16	24					
190.0				79.9	SS-14	9	14	17	31					
185.0				84.4	SS-15	14	23	30	53					
180.0	90.9			89.9	SS-16	15	21	28	49					
		Boring Terminated at 90.4 feet.												
175.0														
170.0														
165.0														

## LEGEND

## SAMPLER TYPE

SS - Split Spoon  
ST - Shelby Tube  
AWG - Rock Core, 1-1/8"

NQ - Rock Core, 1-7/8"  
CU - Cuttings  
CT - Continuous Tube

## DRILLING METHOD

HSA - Hollow Stem Auger  
CFA - Continuous Flight Augers  
DC - Driving Casing

RW - Rotary Wash  
RC - Rock Core

**RBO South Fork Edisto River and Cedar Creek****Aiken County, South Carolina****File #: 2.127B.01, PIN#: 26432, S&ME #: 1611-04-386****LOG OF BORING No. B-33**

Station:

542+72

Offset:

38.5 ft. L of C/L

Date Drilled: 03/04/05

Supervisor: TH

Casing Length: 25 ft.

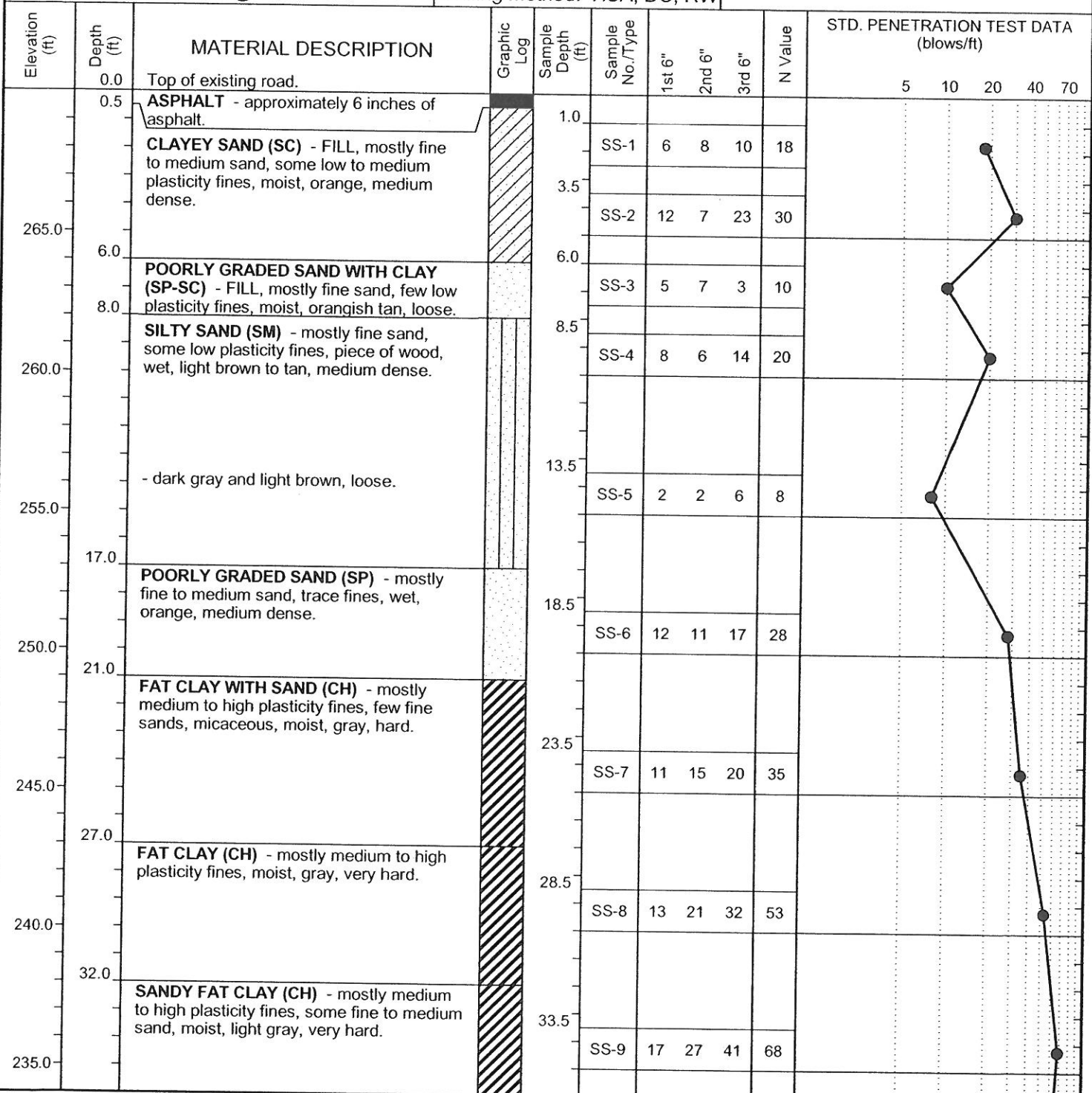
Ground Elevation: 270.0

Hammer Type: ☒ Gravity ☐ Automatic ☐ Other:

Water Level: Hole cave @ 9 ft.

Drilling Method: HSA, DC, RW

Notes:

**Final Boring Log (05/05/05).** Mobile B-57 Drill Rig. HSA 0-15 ft. Driving casing 0-25 ft. Mud rotary with drag bit 25-85 ft.**LEGEND***Continued Next Page*SS - Split Spoon  
ST - Shelby Tube  
AWG - Rock Core, 1-1/8"**SAMPLER TYPE**NQ - Rock Core, 1-7/8"  
CU - Cuttings  
CT - Continuous Tube**DRILLING METHOD**HSA - Hollow Stem Auger  
CFA - Continuous Flight Augers  
DC - Driving Casing  
RW - Rotary Wash  
RC - Rock Core



RBO South Fork Edisto River and Cedar Creek

Aiken County, South Carolina

File #: 2.127B.01, PIN#: 26432, S&amp;ME #: 1611-04-386

## LOG OF BORING No. B-33

Station:

542+72

Offset:

38.5 ft. L of C/L

Date Drilled: 03/04/05

Supervisor: TH

Casing Length: 25 ft.

Ground Elevation: 270.0

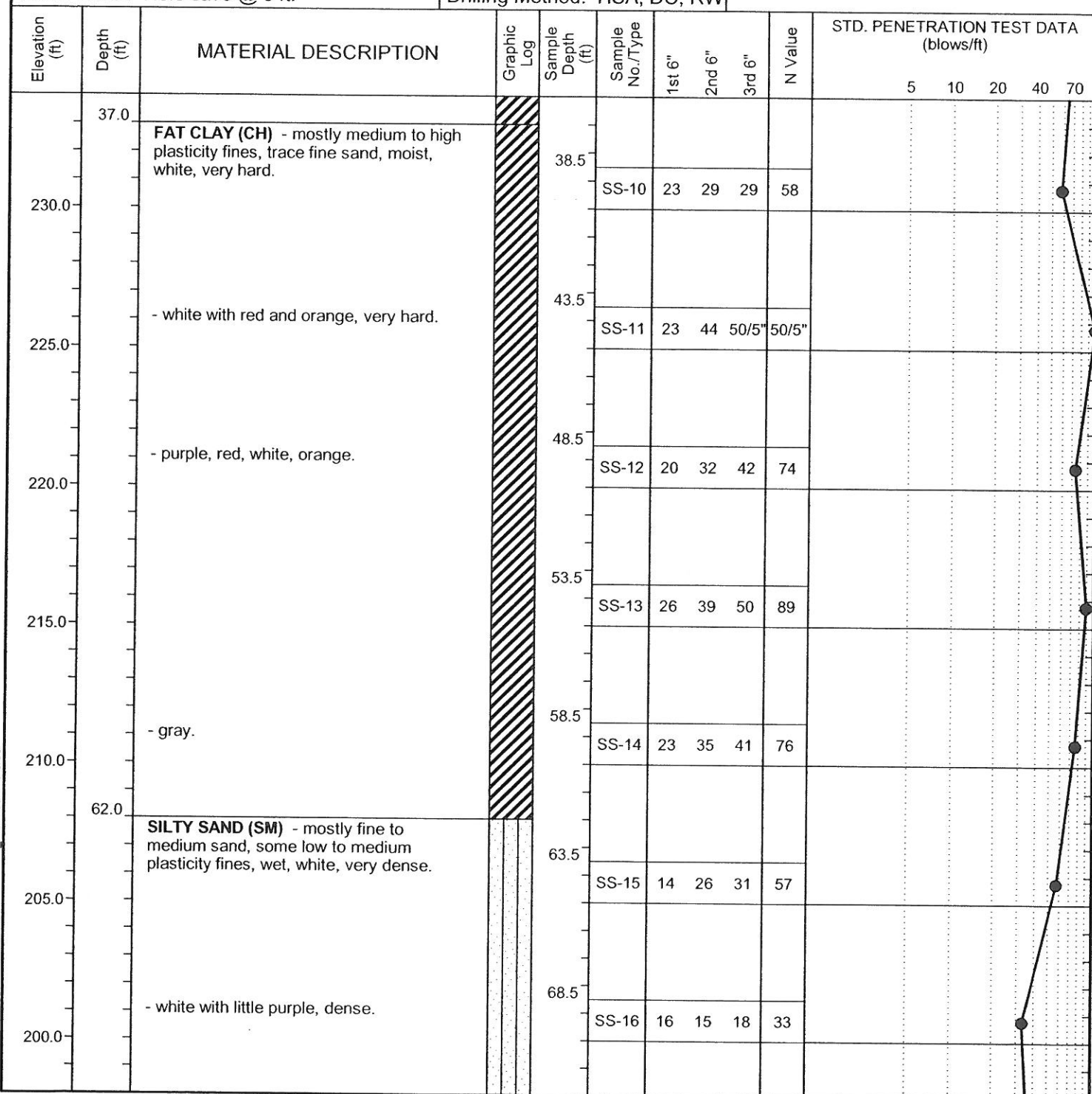
Hammer Type: ☒ Gravity ☐ Automatic ☐ Other:

Notes:

**Final Boring Log (05/05/05).** Mobile B-57 Drill Rig. HSA 0-15 ft. Driving casing 0-25 ft. Mud rotary with drag bit 25-85 ft.

Water Level: Hole cave @ 9 ft.

Drilling Method: HSA, DC, RW



## LEGEND

Continued Next Page

SAMPLER TYPE  
SS - Split Spoon  
ST - Shelby Tube  
AWG - Rock Core, 1-1/8"  
NQ - Rock Core, 1-7/8"  
CU - Cuttings  
CT - Continuous Tube

DRILLING METHOD  
HSA - Hollow Stem Auger  
CFA - Continuous Flight Augers  
DC - Driving Casing  
RW - Rotary Wash  
RC - Rock Core



RBO South Fork Edisto River and Cedar Creek

Aiken County, South Carolina

File #: 2.127B.01, PIN#: 26432, S&amp;ME #: 1611-04-386

## LOG OF BORING No. B-33

Station:

542+72

Offset:

38.5 ft. L of C/L

Date Drilled: 03/04/05

Supervisor: TH

Casing Length: 25 ft.

Ground Elevation: 270.0

Hammer Type: ☒ Gravity ☐ Automatic ☐ Other:

Water Level: Hole cave @ 9 ft.

Drilling Method: HSA, DC, RW

Notes:

**Final Boring Log (05/05/05).** Mobile B-57 Drill Rig. HSA 0-15 ft. Driving casing 0-25 ft. Mud rotary with drag bit 25-85 ft.

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" 2nd 6" 3rd 6"			N Value	STD. PENETRATION TEST DATA (blows/ft)				
										5	10	20	40	70
195.0	77.0	- mostly fine sand, white.		73.5	SS-17	16	16	21	37					
190.0		<b>ELASTIC SILT (MH)</b> - mostly medium to high plasticity fines, moist, light gray and red, very hard.		78.5	SS-18	17	25	31	56					
185.0	85.0	- light gray, red, orange.		83.5	SS-19	29	44	50/5"	50/5"					
		Boring Terminated at 85 feet.												
180.0														
175.0														
170.0														
165.0														

## LEGEND

SAMPLER TYPE  
SS - Split Spoon  
ST - Shelby Tube  
AWG - Rock Core, 1-1/8"  
NQ - Rock Core, 1-7/8"  
CU - Cuttings  
CT - Continuous Tube

DRILLING METHOD  
HSA - Hollow Stem Auger  
CFA - Continuous Flight Augers  
DC - Driving Casing  
RW - Rotary Wash  
RC - Rock Core



RBO South Fork Edisto River and Cedar Creek														
Aiken County, South Carolina														
File #: 2.127B.01, PIN#: 26432, S&ME #: 1611-04-386														
Station:														
Offset:														
Date Drilled:	Supervisor:													
Casing Length:	Ground Elevation:													
Hammer Type: <input type="checkbox"/> Gravity <input checked="" type="checkbox"/> Automatic <input type="checkbox"/> Other:														
Water Level: 11.2 ft. @ TOB.		Drilling Method: HSA												
Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	N Value	STD. PENETRATION TEST DATA (blows/ft)  5     10    20    40    70				
	0.0	Top of existing road.												
	0.6	<b>ASPHALT</b> - approximately 7 inches of asphalt.		1.0										
		<b>CLAYEY SAND (SC)</b> - FILL, mostly fine to medium sand, little low to medium plasticity fines, dry, brown and orange, medium dense to loose.			SS-1	7	7	6	13					
				3.5										
266.0	5.5				SS-2	3	4	4	8					
	7.0	<b>POORLY GRADED SAND WITH SILT (SP-SM)</b> - FILL, mostly fine sand, few non-plastic fines, moist to wet, tan, very loose to loose.		6.0										
	8.0	<b>PEAT (OL)</b> - grades as Silt, mostly low to medium plasticity fines, pieces of wood, organic odor, wet, black, firm.		8.5										
261.0		<b>POORLY GRADED SAND (SP)</b> - mostly fine sand, wet, light gray to tan, medium dense.			SS-3	1	1	4	5					
	12.0	<b>SILTY SAND WITH GRAVEL (SM)</b> - mostly fine to coarse sand, some non-plastic fines, few fine to medium subrounded gravel, saturated, orange, loose.		13.5										
256.0	17.0	<b>POORLY GRADED SAND WITH GRAVEL (SP)</b> - mostly fine to coarse sand, some fine to medium subrounded gravel, saturated, tan, medium dense.		18.5										
251.0		<b>SILTY SAND (SM)</b> - mostly fine to coarse sand, some low to medium plasticity fines, wet, white and purple, medium dense.		23.5										
246.0	25.0	Boring Terminated at 25 feet.			SS-4	3	7	9	16					
					SS-5	5	4	5	9					
					SS-6	6	6	7	13					
					SS-7	5	6	6	12					
241.0														
236.0														

**LEGEND**

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
ST - Shelby Tube	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC\_DOT 04-386 SC 4 BRIDGE OVER EDISTO RIVER GPJ SC DOT GDT 5/5/05





RBO South Fork Edisto River and Cedar Creek

Aiken County, South Carolina

File #: 2.127B.01, PIN#: 26432, S&amp;ME #: 1611-04-386

## LOG OF BORING No. B-35

Station:

549+00

Offset:

38.5 ft. L of C/L

Date Drilled: 02/25/05

Supervisor: TH

Casing Length: N/A

Ground Elevation: 282.0

Notes:

Final Boring Log (05/05/05). Mobile B-57 Drill Rig.

Hammer Type: ☒ Gravity ☐ Automatic ☐ Other:

Water Level: 10.4 ft. @ TOB.

Drilling Method: HSA

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	N Value	STD. PENETRATION TEST DATA (blows/ft)
	0.0	Top of existing road.								5 10 20 40 70
	0.5	ASPHALT - approximately 6 inches of asphalt.		1.0	SS-1	12	16	12	28	
		CLAYEY SAND (SC) - FILL, mostly fine to medium sand, little low to medium plasticity fines, moist, orange and brown, medium dense.		3.5	SS-2	7	6	5	11	
277.0	6.0	- slight increase in fines.		6.0	SS-3	6	2	3	5	
		SILTY SAND (SM) - mostly fine to medium sand, some low plasticity fines, wet, brown, loose.		8.5	SS-4	3	2	5	7	
272.0	12.0	- light brown, few fine rounded gravel.		13.5	SS-5	15	15	16	31	
		POORLY GRADED SAND (SP) - mostly fine to medium sand, trace fines, wet, light brown to tan, dense.		18.5	SS-6	16	26	30	56	
267.0	17.0	POORLY GRADED SAND WITH SILT (SP-SM) - mostly fine to medium sand, few non-plastic fines, wet, light red.								
262.0	20.0	Boring Terminated at 20 feet.								
257.0										
252.0										
247.0										

## LEGEND

SS - Split Spoon

## SAMPLER TYPE

NQ - Rock Core, 1-7/8"

ST - Shelby Tube

CU - Cuttings

AWG - Rock Core, 1-1/8"

CT - Continuous Tube

## DRILLING METHOD

HSA - Hollow Stem Auger

RW - Rotary Wash

CFA - Continuous Flight Augers

RC - Rock Core

DC - Driving Casing

# LEGEND TO SOIL CLASSIFICATION AND SYMBOLS

## SOIL TYPES

(Shown in Graphic Log)



Fill



Asphalt



Concrete



Topsoil



Gravel



Sand



Silt



Clay



Organic



Silty Sand



Clayey Sand



Sandy Silt



Clayey Silt



Sandy Clay



Silty Clay



Partially Weathered Rock



Cored Rock

## WATER LEVELS

(Shown in Water Level Column)

▽ = Water Level At Termination of Boring

▽ = Water Level Taken After 24 Hours

◀ = Loss of Drilling Water

HC = Hole Cave

## CONSISTENCY OF COHESIVE SOILS

### CONSISTENCY

Very Soft

Soft

Firm

Stiff

Very Stiff

Hard

Very Hard

### STD. PENETRATION RESISTANCE BLOWS/FOOT

0 to 2

3 to 4

5 to 8

9 to 15

16 to 30

31 to 50

Over 50

## RELATIVE DENSITY OF COHESIONLESS SOILS

### RELATIVE DENSITY

Very Loose

Loose

Medium Dense

Dense

Very Dense

### STD. PENETRATION RESISTANCE BLOWS/FOOT

0 to 4

5 to 10

11 to 30

31 to 50

Over 50

## SAMPLER TYPES

(Shown in Samples Column)



Shelby Tube



Split Spoon



Rock Core



No Recovery

## TERMS

**Standard Penetration Resistance** - The Number of Blows of 140 lb. Hammer Falling 30 in. Required to Drive 1.4 in. I.D. Split Spoon Sampler 1 Foot. As Specified in ASTM D-1588.

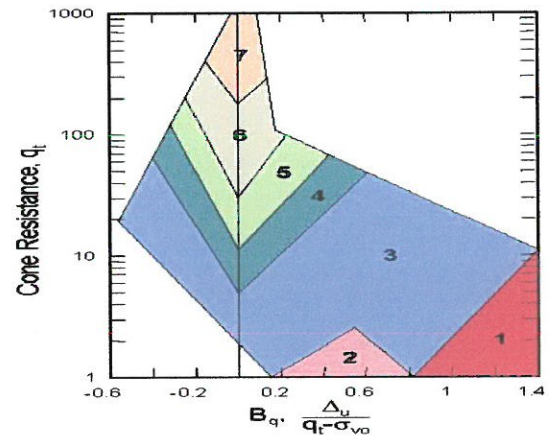
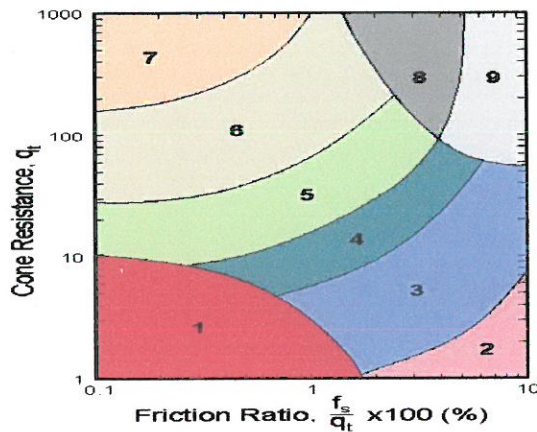
**REC** - Total Length of Rock Recovered in the Core Barrel Divided by the Total Length of the Core Run Times 100%.

**RQD** - Total Length of Sound Rock Segments Recovered that are Longer Than or Equal to 4" (mechanical breaks excluded) Divided by the Total Length of the Core Run Times 100%.



ENGINEERING • TESTING  
ENVIRONMENTAL SERVICES

## CPT Soil Behavior Type Legend (Robertson et al. 1990)



### Zone

### Soil Behavior Type

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

\*Overconsolidated or Cemented

### General Notes:

UNC – Uncorrected

COR – Corrected

Class. FR – Classification based on Friction Ratio, PK Robertson, 1990, see above graph, determines Soil Behavior Type (SBT)

N<sub>eq</sub>, Blow Counts – after PK Robertson 1990, uses Tip Stress UNC, q<sub>c</sub>; atmospheric pressure, p<sub>a</sub>

φ', Friction Angle - Robertson & Campanella 1988,

uses Tip Stress UNC, q<sub>c</sub>;

effective overburden stress, σ'<sub>vo</sub>;

$$\tan \phi' = \frac{1}{2.68} * \left[ \log \left( \frac{q_c}{\sigma'_{vo}} \right) + 0.29 \right]$$

S<sub>u</sub>, Undrained Shear Strength - Robertson & Campanella 1988;

uses Tip Stress COR, q<sub>t</sub>;

overburden stress, σ<sub>vo</sub>;

N<sub>kt</sub> = 15

$$S_u = \left( \frac{q_t - \sigma_{vo}}{N_{kt}} \right)$$

## Particle Size Analysis of Soils

ASTM D 422



Project #: 1611-04-386

Project Name: RBO South Fork Edisto River &amp; Cedar Creek

Client Name: SCDOT

Client Address: PO Box 191, Columbia, SC 29202-0191

Test Date(s): 4/13/05-4/28/05

Report Date: 5/1/05

Boring #: 1

Sample #: 2

Sample Date: Various

Location: B-1

Elevation: 3.5'-5.0'

Sample Description: Poorly Graded Sand (SP, A-1-b) low plasticity, fine to medium sand, orange

Particle Size Analysis / Without Hydrometer Analysis			Moisture Content		Natural
				Tare #	203
	Tare Number	203.0	A	Tare Weight	0.00
A	Tare Weight	0.0	B	Wet Weight + Tare Wt.	148.60
B	Total Sample Dry Wt. + Tare Wt.	0.0	C	Dry Weight + Tare Wt.	143.22
C	Total Sample Dry Weight (B-A)	143.22	D	Water Wt. (B-C)	5.38
D	Total Sample Wt. After #200 Wash	136.64	E	Dry Wt.(C-A)	143.22
E	Percent Passing #200 (1-D/C)x100	4.6%	Moisture Content (100 x D/E) (%)		3.8%
Sieve Size (mm)	Sieve Size	Retained Weight	Percent Retained		Percent Passing Total Sample
37.50	1.5"	0.0	0.0%		100.0%
25.00	1.0"	0.00	0.0%		100.0%
19.00	3/4"	0.00	0.0%		100.0%
12.50	1/2"	0.00	0.0%		100.0%
9.50	3/8"	0.00	0.0%		100.0%
4.75	#4	0.00	0.0%		100.0%
2.36	#8	0.22	0.2%		99.8%
1.18	#16	4.36	3.0%		96.8%
0.60	#30	21.18	14.8%		82.0%
0.30	#50	49.45	34.5%		47.5%
0.15	#100	46.92	32.8%		14.7%
0.075	#200	14.51	10.1%		4.6%

<b>Notes:</b> Maximum Particle Size		Gravel	< 75 mm and > 4.75 mm (#4)	0.0%
Apparent Relative Density		Coarse Sand	< 4.75 mm and > 2.00 mm (#10)	0.2%
Liquid Limit	Fineness Modulus	Medium Sand	< 2.00 mm and > 0.425 mm (#40)	17.8%
Plastic Limit	Cu = D60/D10: 2.7	Fine Sand	< 0.425 mm and > 0.075 mm (#200)	77.4%
Plastic Index	Cc = (D30) <sup>2</sup> / (D10xD60): 1.0	% Silt and Clay	< 0.075 mm	4.6%
		Description of Sand & Gravel	Rounded <input checked="" type="checkbox"/> Angular <input checked="" type="checkbox"/>	
		Hard & Durable <input checked="" type="checkbox"/> Soft <input type="checkbox"/> Weathered & Friable <input type="checkbox"/>		

Organic Content

D10 = 0.14

D30 = 0.23

D60 = 0.38

D50 = 0.32

D90 = 0.8

ASTM D 422: Particle Size Analysis of Soils

Hydrometer portion of test method not utilized.

ASTM D 421: Dry Preparation of Soil Samples

ASTM D 854: Specific Gravity of Soils

ASTM D 4318: Liquid Limit, Plastic Limit, &amp; Plastic Index of Soils

ASTM D 2487: Classification of Soils for Engineering Purposes (Unified Soil Classification System)

Technician Name:

Brian Urban

Certification #

Technical Responsibility:

Trapp Harris

Signature

Staff Professional

Position





## Liquid Limit, Plastic Limit, and Plastic Index

Project #: **1611-04-386**  
 Project Name: RBO South Fork Edisto River & Cedar Creek  
 Client Name: SCDOT  
 Client Address: P.O. Box 191, Columbia, South Carolina, 29202-0191

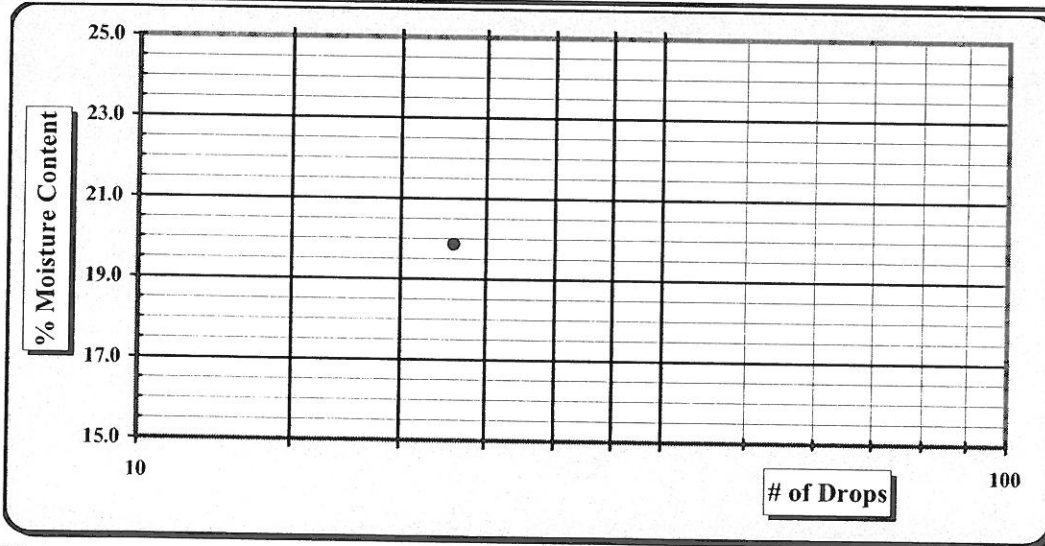
Report Date: 4/26/05  
 Test Date(s): 4/16/05-4/28/05

Boring #: 1 Sample #: 2 Sample Date: Various

Location: B-1 Elevation: 3.5'-5.0'

Sample Description: Poorly Graded Sand (SP, A-1-b) low plasticity, fine to medium sand, orange

Pan #		Liquid Limit						Plastic Limit		
	Test #	1	2	3	4	5	6	1	2	3
	Tare #		e					56	17	
A	Tare Weight		11.82					11.44	11.73	
B	Wet Soil Weight + A		23.89					17.87	17.68	
C	Dry Soil Weight + A		21.89					16.90	16.79	
D	Water Weight (B-C)		2.00					0.97	0.89	
E	Dry Soil Weight (C-A)		10.07					5.46	5.06	
F	% Moisture Content (D/E)*100		19.9%					17.8%	17.6%	
N	# OF DROPS		23					Moisture Contents determined by ASTM D 2216		
LL	LL = F * FACTOR									
Ave.	Average							17.7%		



One Point Liquid Limit			
N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.990	29	1.018
24	0.995	30	1.022
25	1.000		

Notes:

### Special Sampling Methods:

Sample Preparation:	Wet Preparation <input type="checkbox"/>	Dry Preparation <input checked="" type="checkbox"/>	Air Dried <input checked="" type="checkbox"/>	NP, Non-Plastic <input type="checkbox"/>
Liquid limit Test:	Multipoint Method <input checked="" type="checkbox"/>	One-point Method <input type="checkbox"/>		Liquid Limit 20
Classification:	ASTM D 2487 <input type="checkbox"/>	AASHTO M 145 <input checked="" type="checkbox"/>		Plastic Limit 18
Liquid limit Test:	ASTM D 4318 <input type="checkbox"/>	AASHTO T 89 <input checked="" type="checkbox"/>		Plastic Index 2
Plastic limit Test:	ASTM D 4318 <input type="checkbox"/>	AASHTO T 90 <input checked="" type="checkbox"/>		Group Symbol A-1-b

Technician Name: Brian Urban

Certification #

Technical Responsibility: Trapp Harris

Signature

Staff Professional

Position



## Particle Size Analysis of Soils

ASTM D 422



Project #: 1611-04-386

Project Name: RBO South Fork Edisto River &amp; Cedar Creek

Client Name: SCDOT

Client Address: PO Box 191, Columbia, SC 29202-0191

Test Date(s): 4/13/05-4/28/05

Report Date: 5/1/05

Boring #: 2

Sample #: 6

Sample Date: Various

Location: B-2

Elevation: 18.5'-20.0'

Sample Description: Poorly Graded Sand with Silt (SP-SM, A-1-b) low plasticity, fine to medium sand, tan

Particle Size Analysis / Without Hydrometer Analysis			Moisture Content		Natural
	Tare Number	212.0	A	Tare #	212
A	Tare Weight	0.0	B	Tare Weight	0.00
B	Total Sample Dry Wt. + Tare Wt.	0.0	C	Wet Weight + Tare Wt.	141.13
C	Total Sample Dry Weight (B-A)	117.71	D	Dry Weight + Tare Wt.	117.71
D	Total Sample Wt. After #200 Wash	107.94	E	Water Wt. (B-C)	23.42
E	Percent Passing #200 (1-D/C)x100	8.3%		Dry Wt.(C-A)	117.71
				Moisture Content (100 x D/E) (%)	19.9%
Sieve Size (mm)	Sieve Size	Retained Weight	Percent Retained		Percent Passing Total Sample
37.50	1.5"	0.0	0.0%		100.0%
25.00	1.0"	0.00	0.0%		100.0%
19.00	3/4"	0.00	0.0%		100.0%
12.50	1/2"	0.00	0.0%		100.0%
9.50	3/8"	0.00	0.0%		100.0%
4.75	#4	0.00	0.0%		100.0%
2.36	#8	1.94	1.6%		98.4%
1.18	#16	9.60	8.2%		90.2%
0.60	#30	31.68	26.9%		63.3%
0.30	#50	43.15	36.7%		26.6%
0.15	#100	15.28	13.0%		13.6%
0.075	#200	6.29	5.3%		8.3%

<b>Notes:</b>		Maximum Particle Size		Gravel		< 75 mm and > 4.75 mm (#4)	0.0%
		Apparent Relative Density		Coarse Sand		< 4.75 mm and > 2.00 mm (#10)	1.6%
Liquid Limit	22	Fineness Modulus		Medium Sand		< 2.00 mm and > 0.425 mm (#40)	35.1%
Plastic Limit	48	Cu = D60/D10: 5.8		Fine Sand		< 0.425 mm and > 0.075 mm (#200)	55.0%
Plastic Index	4	Cc =(D30) <sup>2</sup> / (D10xD60): 1.9		% Silt and Clay		< 0.075 mm	8.3%
				Description of Sand & Gravel		Rounded <input checked="" type="checkbox"/>	Angular <input checked="" type="checkbox"/>
				Hard & Durable <input checked="" type="checkbox"/>		Soft <input type="checkbox"/>	Weathered & Friable <input type="checkbox"/>

Organic Content

D10 = 0.1

D30 = 0.33

D60 = 0.58

D50 = 0.48

D90 = 1.3

ASTM D 422: Particle Size Analysis of Soils

ASTM D 421: Dry Preparation of Soil Samples

ASTM D 4318: Liquid Limit, Plastic Limit, &amp; Plastic Index of Soils

ASTM D 2487: Classification of Soils for Engineering Purposes (Unified Soil Classification System)

Hydrometer portion of test method not utilized.

ASTM D 854: Specific Gravity of Soils

Technician Name:

Brian Urban

Certification #

Technical Responsibility:

Trapp Harris

Signature

Staff Professional

Position



## Liquid Limit, Plastic Limit, and Plastic Index

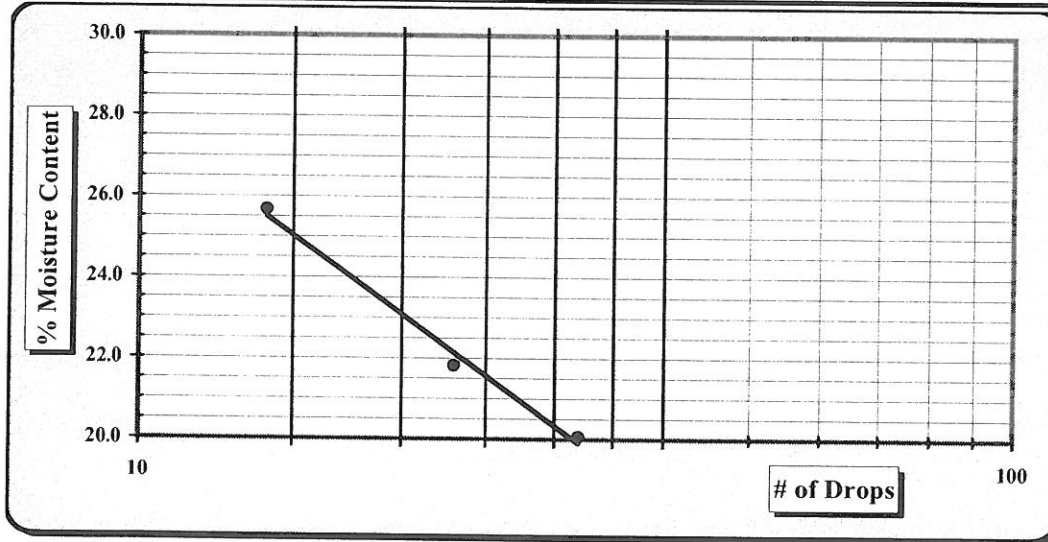
Project #: **1611-04-386**  
 Project Name: RBO South Fork Edisto River & Cedar Creek  
 Client Name: SCDOT  
 Client Address: P.O. Box 191, Columbia, South Carolina, 29202-0191  
 Boring #: 2 Sample #: 6

Report Date: 4/27/05  
 Test Date(s): 4/16/05-4/28/05

Location: B-2 Elevation: 18.5'-20.0'

Sample Description: Poorly Graded Sand with Silt (SP-SM, A-1-b) low plasticity, fine to medium sand, tan

Pan #		Liquid Limit						Plastic Limit		
	Test #	1	2	3	4	5	6	1	2	3
	Tare #	107	1	18				37	71	
A	Tare Weight	13.60	16.96	16.90				16.88	17.06	
B	Wet Soil Weight + A	23.93	25.17	24.38				23.02	23.27	
C	Dry Soil Weight + A	21.82	23.70	23.13				22.11	22.33	
D	Water Weight (B-C)	2.11	1.47	1.25				0.91	0.94	
E	Dry Soil Weight (C-A)	8.22	6.74	6.23				5.23	5.27	
F	% Moisture Content (D/E)*100	25.7%	21.8%	20.1%				17.4%	17.8%	
N	# OF DROPS	14	23	32				Moisture Contents determined by ASTM D 2216		
LL	LL = F * FACTOR									
Ave.	Average							17.6%		



One Point Liquid Limit			
N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.990	29	1.018
24	0.995	30	1.022
25	1.000		

Notes:

### Special Sampling Methods:

Sample Preparation:	Wet Preparation <input type="checkbox"/>	Dry Preparation <input checked="" type="checkbox"/>	Air Dried <input checked="" type="checkbox"/>	NP, Non-Plastic <input type="checkbox"/>
Liquid limit Test:	Multipoint Method <input checked="" type="checkbox"/>	One-point Method <input type="checkbox"/>		Liquid Limit 22
Classification:	ASTM D 2487 <input type="checkbox"/>	AASHTO M 145 <input checked="" type="checkbox"/>		Plastic Limit 18
Liquid limit Test:	ASTM D 4318 <input type="checkbox"/>	AASHTO T 89 <input checked="" type="checkbox"/>		Plastic Index 4
Plastic limit Test:	ASTM D 4318 <input type="checkbox"/>	AASHTO T 90 <input checked="" type="checkbox"/>		Group Symbol A-1-b

Technician Name: Brian Urban

Certification #

Technical Responsibility: Trapp Harris

Signature

Staff Professional

Position

## Particle Size Analysis of Soils

ASTM D 422



Project #: 1611-04-386

Project Name: RBO South Fork Edisto River &amp; Cedar Creek

Client Name: SCDOT

Client Address: PO Box 191, Columbia, SC 29202-0191

Test Date(s): 4/13/05-4/28/05

Report Date: 5/1/05

Boring #: 3

Sample #: 5

Sample Date: Various

Location: B-3 Note: Material retained on sieves was mostly organic

Elevation: 13.5'-15.0'

Sample Description: \*Vegetation in Sample- Sandy Silt (OL, A-7-6) medium plasticity, fine to medium sand, black

Particle Size Analysis / Without Hydrometer Analysis			Moisture Content		Natural
				Tare #	312
	Tare Number	312.0	A	Tare Weight	0.00
A	Tare Weight	0.0	B	Wet Weight + Tare Wt.	100.28
B	Total Sample Dry Wt. + Tare Wt.	0.0	C	Dry Weight + Tare Wt.	42.81
C	Total Sample Dry Weight (B-A)	42.81	D	Water Wt. (B-C)	57.47
D	Total Sample Wt. After #200 Wash	39.93	E	Dry Wt.(C-A)	42.81
E	Percent Passing #200 (1-D/C)x100	6.7%	Moisture Content (100 x D/E) (%)		134.2%
Sieve Size (mm)	Sieve Size	Retained Weight	Percent Retained		Percent Passing Total Sample
37.50	1.5"	0.0	0.0%		100.0%
25.00	1.0"	0.00	0.0%		100.0%
19.00	3/4"	0.00	0.0%		100.0%
12.50	1/2"	0.00	0.0%		100.0%
9.50	3/8"	0.00	0.0%		100.0%
4.75	#4	13.23	30.9%		69.1%
2.36	#8	5.62	13.1%		56.0%
1.18	#16	4.46	10.4%		45.6%
0.60	#30	4.62	10.8%		34.8%
0.30	#50	5.16	12.1%		22.7%
0.15	#100	4.48	10.5%		12.2%
0.075	#200	2.36	5.5%		6.7%
<b>Notes:</b>		Maximum Particle Size	Gravel	< 75 mm and > 4.75 mm (#4) 30.9%	
		Apparent Relative Density	Coarse Sand	< 4.75 mm and > 2.00 mm (#10) 13.1%	
Liquid Limit	42	Fineness Modulus	Medium Sand	< 2.00 mm and > 0.425 mm (#40) 21.2%	
Plastic Limit	26	Cu = D60/D10: 25.0	Fine Sand	< 0.425 mm and > 0.075 mm (#200) 28.0%	
Plastic Index	16	Cc = (D30) <sup>2</sup> / (D10xD60): 0.6	% Silt and Clay	< 0.075 mm 6.7%	
			Description of Sand & Gravel	Rounded <input checked="" type="checkbox"/>	Angular <input checked="" type="checkbox"/>
			Hard & Durable <input checked="" type="checkbox"/>	Soft <input type="checkbox"/>	Weathered & Friable <input type="checkbox"/>

Organic Content

D10 = 0.12

D30 = 0.46

D60 = 3

D50 = 1.7

D90 = 7.7

ASTM D 422: Particle Size Analysis of Soils

Hydrometer portion of test method not utilized.

ASTM D 421: Dry Preparation of Soil Samples

ASTM D 854: Specific Gravity of Soils

ASTM D 4318: Liquid Limit, Plastic Limit, &amp; Plastic Index of Soils

ASTM D 2487: Classification of Soils for Engineering Purposes (Unified Soil Classification System)

Technician Name:

Brian Urban

Certification #

Technical Responsibility:

Trapp Harris

Signature

Staff Professional

Position



## Liquid Limit, Plastic Limit, and Plastic Index

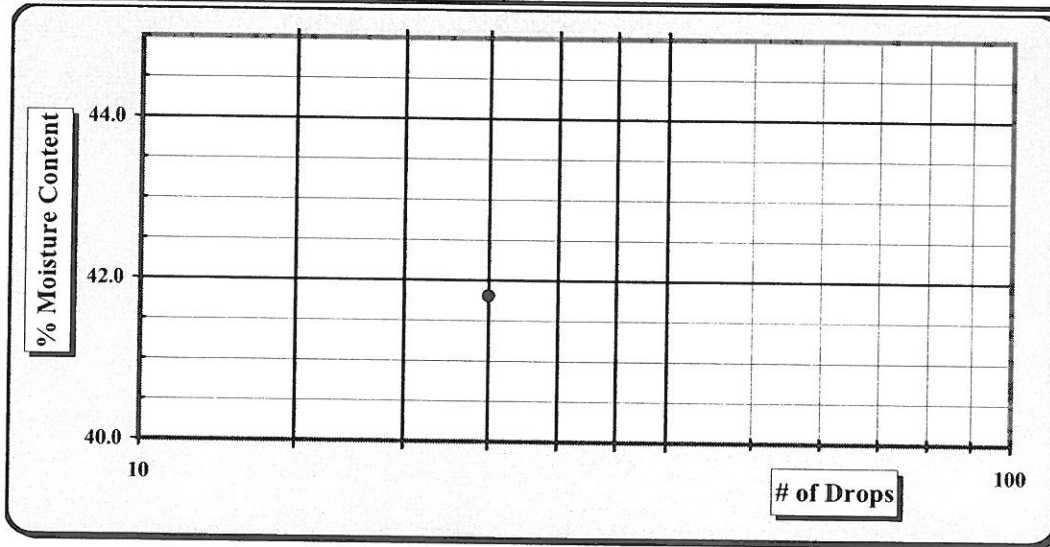
Project #: **1611-04-386**  
 Project Name: **RBO South Fork Edisto River & Cedar Creek**  
 Client Name: **SCDOT**  
 Client Address: **P.O. Box 191, Columbia, South Carolina, 29202-0191**  
 Boring #: **3** Sample #: **5**

Report Date: **4/26/05**  
 Test Date(s): **4/16/05-4/28/05**

Location: **B-3** Elevation: **13.5'-15.0'**

Sample Description: **Organic Sandy Silt (OL, A-7-6) medium plasticity, fine to medium sand, black**

Pan #		Liquid Limit						Plastic Limit		
	Test #	1	2	3	4	5	6	1	2	3
	Tare #		131					8		
A	Tare Weight		13.54					13.57		
B	Wet Soil Weight + A		17.78					15.11		
C	Dry Soil Weight + A		16.53					14.79		
D	Water Weight (B-C)		1.25					0.32		
E	Dry Soil Weight (C-A)		2.99					1.22		
F	% Moisture Content (D/E)*100		41.8%					26.2%		
N	# OF DROPS		25					Moisture Contents determined by ASTM D 2216		
LL	LL = F * FACTOR									
Ave.	Average							26.2%		



One Point Liquid Limit			
N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.990	29	1.018
24	0.995	30	1.022
25	1.000		

Notes:

### Special Sampling Methods:

Sample Preparation:	Wet Preparation <input type="checkbox"/>	Dry Preparation <input checked="" type="checkbox"/>	Air Dried <input checked="" type="checkbox"/>	NP, Non-Plastic <input type="checkbox"/>
Liquid limit Test:	Multipoint Method <input checked="" type="checkbox"/>	One-point Method <input type="checkbox"/>		Liquid Limit <u>42</u>
Classification:	ASTM D 2487 <input type="checkbox"/>	AASHTO M 145 <input checked="" type="checkbox"/>		Plastic Limit <u>26</u>
Liquid limit Test:	ASTM D 4318 <input type="checkbox"/>	AASHTO T 89 <input checked="" type="checkbox"/>		Plastic Index <u>16</u>
Plastic limit Test:	ASTM D 4318 <input type="checkbox"/>	AASHTO T 90 <input checked="" type="checkbox"/>		Group Symbol <u>A-7-6</u>

Technician Name: Brian Urban

Certification #

Technical Responsibility: Trapp Harris

Signature

Staff Professional

Position



## Particle Size Analysis of Soils

ASTM D 422



Project #: 1611-04-386

Project Name: RBO South Fork Edisto River &amp; Cedar Creek

Client Name: SCDOT

Client Address: PO Box 191, Columbia, SC 29202-0191

Test Date(s): 4/13/05-4/28/05

Report Date: 5/1/05

Boring #: 3

Sample #: 6

Sample Date: Various

Location: B-3

Elevation: 18.5'-20.0'

Sample Description: Sandy Elastic Silt (MH, A-7-5) medium plasticity, fine to medium sand, light brown

Particle Size Analysis / Without Hydrometer Analysis			Moisture Content		Natural
				Tare #	218
	Tare Number	218.0	A	Tare Weight	0.00
A	Tare Weight	0.0	B	Wet Weight + Tare Wt.	120.95
B	Total Sample Dry Wt. + Tare Wt.	0.0	C	Dry Weight + Tare Wt.	75.14
C	Total Sample Dry Weight (B-A)	75.14	D	Water Wt. (B-C)	45.81
D	Total Sample Wt. After #200 Wash	29.52	E	Dry Wt.(C-A)	75.14
E	Percent Passing #200 (1-D/C)x100	60.7%	Moisture Content (100 x D/E) (%)		61.0%
Sieve Size (mm)	Sieve Size	Retained Weight	Percent Retained		Percent Passing Total Sample
37.50	1.5"	0.0	0.0%		100.0%
25.00	1.0"	0.00	0.0%		100.0%
19.00	3/4"	0.00	0.0%		100.0%
12.50	1/2"	0.00	0.0%		100.0%
9.50	3/8"	0.00	0.0%		100.0%
4.75	#4	0.78	1.0%		99.0%
2.36	#8	0.95	1.3%		97.7%
1.18	#16	3.13	4.2%		93.5%
0.60	#30	5.09	6.8%		86.8%
0.30	#50	6.80	9.0%		77.7%
0.15	#100	4.88	6.5%		71.2%
0.075	#200	7.89	10.5%		60.7%

<b>Notes:</b>		Maximum Particle Size	Gravel	< 75 mm and > 4.75 mm (#4)	1.0%
		Apparent Relative Density	Coarse Sand	< 4.75 mm and > 2.00 mm (#10)	1.3%
Liquid Limit	55	Fineness Modulus	Medium Sand	< 2.00 mm and > 0.425 mm (#40)	10.9%
Plastic Limit	36	Cu = D60/D10:	Fine Sand	< 0.425 mm and > 0.075 mm (#200)	26.0%
Plastic Index	19	Cc = (D30) <sup>2</sup> / (D10xD60):	% Silt and Clay	< 0.075 mm	60.7%
		Description of Sand & Gravel		Rounded <input checked="" type="checkbox"/>	Angular <input checked="" type="checkbox"/>
		Hard & Durable <input checked="" type="checkbox"/>		Soft <input type="checkbox"/>	Weathered & Friable <input type="checkbox"/>

Organic Content

D10 =

D30 =

D60 =

D50 =

D90 =

ASTM D 422: Particle Size Analysis of Soils

Hydrometer portion of test method not utilized.

ASTM D 421: Dry Preparation of Soil Samples

ASTM D 854: Specific Gravity of Soils

ASTM D 4318: Liquid Limit, Plastic Limit, &amp; Plastic Index of Soils

ASTM D 2487: Classification of Soils for Engineering Purposes (Unified Soil Classification System)

Technician Name:

Brian Urban

Certification #

Technical Responsibility:

Trapp Harris

Signature

Staff Professional

Position





## Liquid Limit, Plastic Limit, and Plastic Index

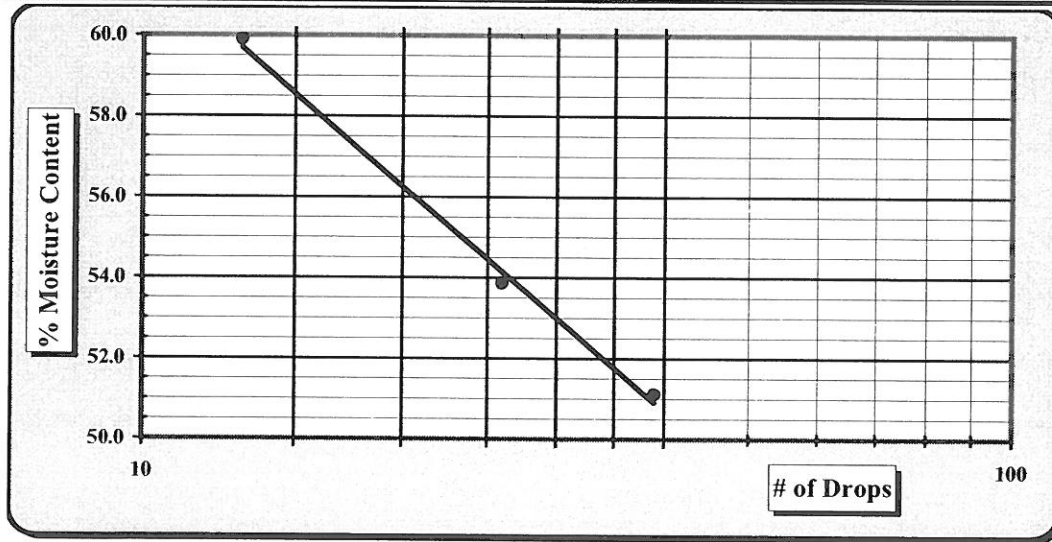
Project #: **1611-04-386**  
 Project Name: RBO South Fork Edisto River & Cedar Creek  
 Client Name: SCDOT  
 Client Address: P.O. Box 191, Columbia, South Carolina, 29202-0191  
 Boring #: **3** Sample #: **6** Sample Date: Various

Report Date: 4/27/05  
 Test Date(s): 4/16/05-4/28/05

Location: B-3 Elevation: 18.5'-20.0'

Sample Description: Sandy Elastic Silt (MH, A-7-5) medium plasticity, fine to medium sand, light brown

Pan #		Liquid Limit						Plastic Limit		
	Test #	1	2	3	4	5	6	1	2	3
	Tare #	144	112	129				109	131	
A	Tare Weight	13.72	13.80	13.89				13.76	13.56	
B	Wet Soil Weight + A	22.69	21.37	22.02				16.74	16.83	
C	Dry Soil Weight + A	19.33	18.72	19.27				15.96	15.97	
D	Water Weight (B-C)	3.36	2.65	2.75				0.78	0.86	
E	Dry Soil Weight (C-A)	5.61	4.92	5.38				2.20	2.41	
F	% Moisture Content (D/E)*100	59.9%	53.9%	51.1%				35.5%	35.7%	
N	# OF DROPS	13	26	39				Moisture Contents determined by ASTM D 2216		
LL	LL = F * FACTOR									
Ave.	Average							35.6%		



One Point Liquid Limit			
N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.990	29	1.018
24	0.995	30	1.022
25	1.000		

Notes:

### Special Sampling Methods:

Sample Preparation:	Wet Preparation <input type="checkbox"/>	Dry Preparation <input checked="" type="checkbox"/>	Air Dried <input checked="" type="checkbox"/>	NP, Non-Plastic <input type="checkbox"/>
Liquid limit Test:	Multipoint Method <input checked="" type="checkbox"/>	One-point Method <input type="checkbox"/>		Liquid Limit <u>55</u>
Classification:	ASTM D 2487 <input type="checkbox"/>	AASHTO M 145 <input checked="" type="checkbox"/>		Plastic Limit <u>36</u>
Liquid limit Test:	ASTM D 4318 <input type="checkbox"/>	AASHTO T 89 <input checked="" type="checkbox"/>		Plastic Index <u>19</u>
Plastic limit Test:	ASTM D 4318 <input type="checkbox"/>	AASHTO T 90 <input checked="" type="checkbox"/>		Group Symbol <u>A-7-5</u>

Technician Name: Brian Urban

Certification #

Technical Responsibility: Trapp Harris

Signature

Staff Professional

Position

## Particle Size Analysis of Soils

ASTM D 422



Project #: 1611-04-386

Project Name: RBO South Fork Edisto River &amp; Cedar Creek

Client Name: SCDOT

Client Address: PO Box 191, Columbia, SC 29202-0191

Test Date(s): 4/13/05-4/28/05

Report Date: 5/1/05

Boring #: 4

Sample #: 4

Sample Date: Various

Location: B-4

Elevation: 13.5'-15.0'

Sample Description: Poorly Graded Sand with Clay (SP-SC, A-1-b) low plasticity, fine to medium sand, tan

Particle Size Analysis / Without Hydrometer Analysis			Moisture Content		Natural
	Tare Number	207.0	A	Tare Weight	0.00
A	Tare Weight	0.0	B	Wet Weight + Tare Wt.	142.36
B	Total Sample Dry Wt. + Tare Wt.	0.0	C	Dry Weight + Tare Wt.	135.27
C	Total Sample Dry Weight (B-A)	135.27	D	Water Wt. (B-C)	7.09
D	Total Sample Wt. After #200 Wash	121.33	E	Dry Wt.(C-A)	135.27
E	Percent Passing #200 (1-D/C)x100	10.3%	Moisture Content (100 x D/E) (%)		5.2%
Sieve Size (mm)	Sieve Size	Retained Weight	Percent Retained		Percent Passing Total Sample
37.50	1.5"	0.0	0.0%		100.0%
25.00	1.0"	0.00	0.0%		100.0%
19.00	3/4"	0.00	0.0%		100.0%
12.50	1/2"	0.00	0.0%		100.0%
9.50	3/8"	0.00	0.0%		100.0%
4.75	#4	0.79	0.6%		99.4%
2.36	#8	3.71	2.7%		96.7%
1.18	#16	14.84	11.0%		85.7%
0.60	#30	29.41	21.7%		64.0%
0.30	#50	38.02	28.1%		35.9%
0.15	#100	24.65	18.2%		17.6%
0.075	#200	9.91	7.3%		10.3%

<b>Notes:</b>		Maximum Particle Size		Gravel	< 75 mm and > 4.75 mm (#4)	0.6%
		Apparent Relative Density		Coarse Sand	< 4.75 mm and > 2.00 mm (#10)	2.7%
Liquid Limit	15	Fineness Modulus		Medium Sand	< 2.00 mm and > 0.425 mm (#40)	32.7%
Plastic Limit	13	Cu = D60/D10: 0.7		Fine Sand	< 0.425 mm and > 0.075 mm (#200)	53.7%
Plastic Index	2	Cc =(D30) <sup>2</sup> / (D10xD60): 0.2		% Silt and Clay	< 0.075 mm	10.3%
				Description of Sand & Gravel	Rounded <input checked="" type="checkbox"/>	Angular <input checked="" type="checkbox"/>
				Hard & Durable <input checked="" type="checkbox"/>	Soft <input type="checkbox"/>	Weathered & Friable <input type="checkbox"/>

Organic Content

D10 = 0.75

D30 = 0.26

D60 = 0.54

D50 = 0.42

D90 = 1.5

ASTM D 422: Particle Size Analysis of Soils

Hydrometer portion of test method not utilized.

ASTM D 421: Dry Preparation of Soil Samples

ASTM D 854: Specific Gravity of Soils

ASTM D 4318: Liquid Limit, Plastic Limit, &amp; Plastic Index of Soils

ASTM D 2487: Classification of Soils for Engineering Purposes (Unified Soil Classification System)

Technician Name:

Brian Urban

Certification #

Technical Responsibility:

Trapp Harris

Signature

Staff Professional

Position



## Liquid Limit, Plastic Limit, and Plastic Index

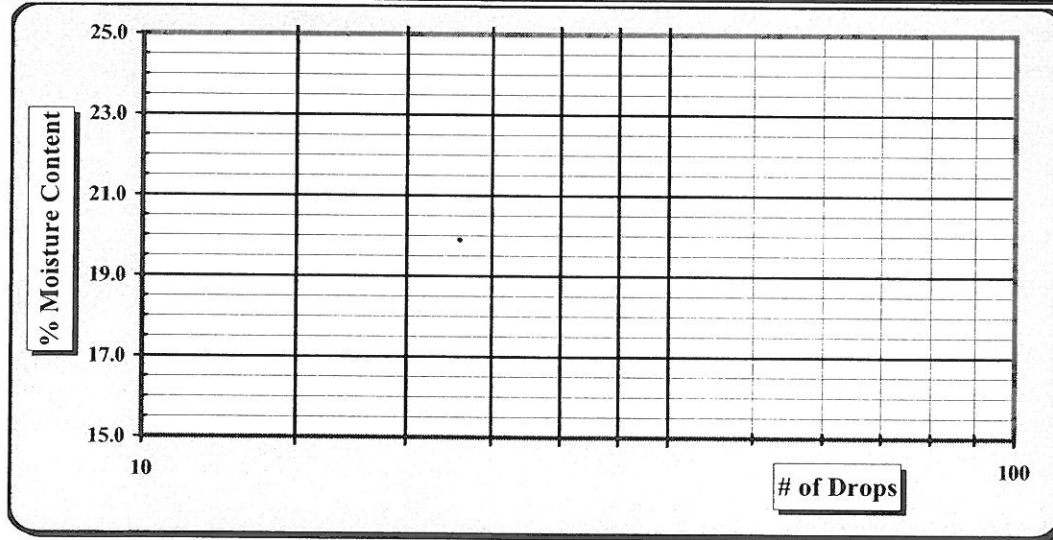
Project #: **1611-04-386**  
 Project Name: **RBO South Fork Edisto River & Cedar Creek**  
 Client Name: **SCDOT**  
 Client Address: **P.O. Box 191, Columbia, South Carolina, 29202-0191**  
 Boring #: **4** Sample #: **4** Sample Date: **Various**

Report Date: **4/26/05**  
 Test Date(s): **4/16/05-4/28/05**

Location: **B-4** Elevation: **13.5'-15.0'**

Sample Description: **Poorly Graded Sand with Clay (SP-SC, A-1-b) low plasticity, fine to medium sand, tan**

Pan #		Liquid Limit						Plastic Limit		
	Test #	1	2	3	4	5	6	1	2	3
	Tare #		k					57	60	
A	Tare Weight		11.60					11.44	11.57	
B	Wet Soil Weight + A		18.66					16.98	17.67	
C	Dry Soil Weight + A		17.74					16.34	16.96	
D	Water Weight (B-C)		0.92					0.64	0.71	
E	Dry Soil Weight (C-A)		6.14					4.90	5.39	
F	% Moisture Content (D/E)*100		15.0%					13.1%	13.2%	
N	# OF DROPS		24					Moisture Contents determined by ASTM D 2216		
LL	LL = F * FACTOR		14.9%							
Ave.	Average							13.1%		



One Point Liquid Limit			
N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.990	29	1.018
24	0.995	30	1.022
25	1.000		

Notes:

### Special Sampling Methods:

Sample Preparation:	Wet Preparation <input type="checkbox"/>	Dry Preparation <input checked="" type="checkbox"/>	Air Dried <input checked="" type="checkbox"/>	NP, Non-Plastic <input type="checkbox"/>
Liquid limit Test:	Multipoint Method <input checked="" type="checkbox"/>	One-point Method <input type="checkbox"/>		Liquid Limit <u>15</u>
Classification:	ASTM D 2487 <input type="checkbox"/>	AASHTO M 145 <input checked="" type="checkbox"/>		Plastic Limit <u>13</u>
Liquid limit Test:	ASTM D 4318 <input type="checkbox"/>	AASHTO T 89 <input checked="" type="checkbox"/>		Plastic Index <u>2</u>
Plastic limit Test:	ASTM D 4318 <input type="checkbox"/>	AASHTO T 90 <input checked="" type="checkbox"/>		Group Symbol <u>A-1-b</u>

Technician Name: Brian Urban

Certification #

Technical Responsibility: Trapp Harris

Signature

Staff Professional

Position

## Particle Size Analysis of Soils

ASTM D 422



Project #: 1611-04-386

Project Name: RBO South Fork Edisto River &amp; Cedar Creek

Client Name: SCDOT

Client Address: PO Box 191, Columbia, SC 29202-0191

Test Date(s): 4/13/05-4/28/05

Report Date: 5/1/05

Boring #: 5

Sample #: 5

Sample Date: Various

Location: B-5

Elevation: 13.5'-15.0'

Sample Description: Clayey Sand (SC, A-2-6) low plasticity, fine to medium sand, tan

Particle Size Analysis / Without Hydrometer Analysis			Moisture Content		Natural
				Tare #	221
	Tare Number	221.0	A	Tare Weight	0.00
A	Tare Weight	0.0	B	Wet Weight + Tare Wt.	146.71
B	Total Sample Dry Wt. + Tare Wt.	0.0	C	Dry Weight + Tare Wt.	125.02
C	Total Sample Dry Weight (B-A)	125.02	D	Water Wt. (B-C)	21.69
D	Total Sample Wt. After #200 Wash	81.19	E	Dry Wt.(C-A)	125.02
E	Percent Passing #200 (1-D/C)x100	35.1%	Moisture Content (100 x D/E) (%)		17.3%
Sieve Size (mm)	Sieve Size	Retained Weight	Percent Retained		Percent Passing Total Sample
37.50	1.5"	0.0	0.0%		100.0%
25.00	1.0"	0.00	0.0%		100.0%
19.00	3/4"	0.00	0.0%		100.0%
12.50	1/2"	0.00	0.0%		100.0%
9.50	3/8"	0.00	0.0%		100.0%
4.75	#4	0.00	0.0%		100.0%
2.36	#8	1.01	0.8%		99.2%
1.18	#16	7.46	6.0%		93.2%
0.60	#30	14.48	11.6%		81.6%
0.30	#50	21.50	17.2%		64.4%
0.15	#100	19.61	15.7%		48.8%
0.075	#200	17.13	13.7%		35.1%

<b>Notes:</b>		Maximum Particle Size	Gravel	< 75 mm and > 4.75 mm (#4)	0.0%
		Apparent Relative Density	Coarse Sand	< 4.75 mm and > 2.00 mm (#10)	0.8%
Liquid Limit	33	Fineness Modulus	Medium Sand	< 2.00 mm and > 0.425 mm (#40)	17.5%
Plastic Limit	17	Cu = D60/D10:	Fine Sand	< 0.425 mm and > 0.075 mm (#200)	46.6%
Plastic Index	16	Cc = (D30) <sup>2</sup> / (D10xD60):	% Silt and Clay	< 0.075 mm	35.1%
			Description of Sand & Gravel	Rounded <input checked="" type="checkbox"/> Angular <input checked="" type="checkbox"/>	
			Hard & Durable <input checked="" type="checkbox"/> Soft <input type="checkbox"/> Weathered & Friable <input type="checkbox"/>		

Organic Content

D10 =

D30 =

D60 =

D50 =

D90 =

ASTM D 422: Particle Size Analysis of Soils

Hydrometer portion of test method not utilized.

ASTM D 421: Dry Preparation of Soil Samples

ASTM D 854: Specific Gravity of Soils

ASTM D 4318: Liquid Limit, Plastic Limit, &amp; Plastic Index of Soils

ASTM D 2487: Classification of Soils for Engineering Purposes (Unified Soil Classification System)

Technician Name:

Brian Urban

Certification #

Technical Responsibility:

Trapp Harris

Signature

Staff Professional

Position





## Liquid Limit, Plastic Limit, and Plastic Index

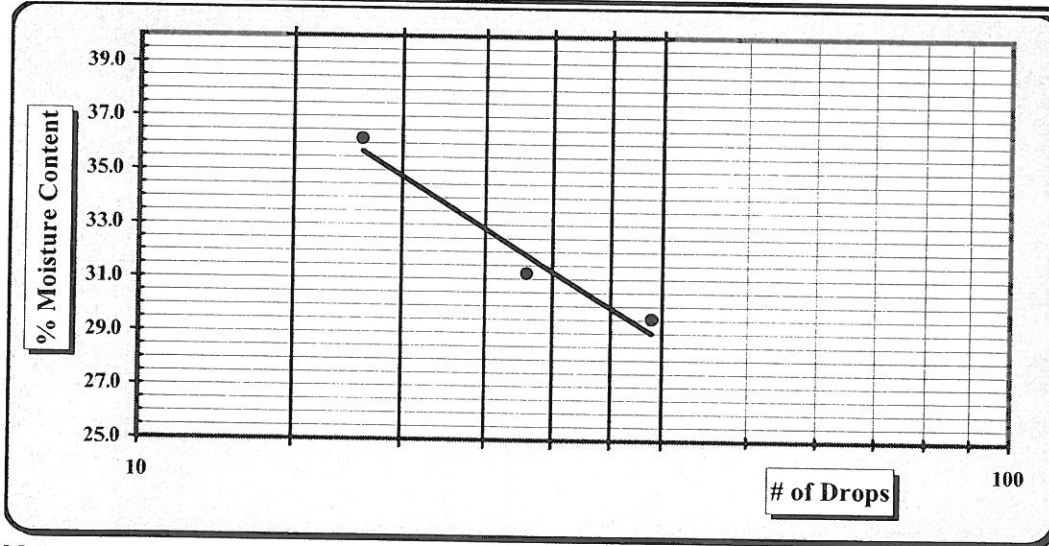
Project #: **1611-04-386**  
 Project Name: **RBO South Fork Edisto River & Cedar Creek**  
 Client Name: **SCDOT**  
 Client Address: **P.O. Box 191, Columbia, South Carolina, 29202-0191**  
 Boring #: **5** Sample #: **5** Sample Date: **Various**

Report Date: **4/27/05**  
 Test Date(s): **4/16/05-4/28/05**

Location: **B-5** Elevation: **13.5'-15.0'**

Sample Description: **Clayey Sand (SC, A-2-6) low plasticity, fine to medium sand, tan**

Pan #	Test #	Liquid Limit						Plastic Limit		
		1	2	3	4	5	6	1	2	3
	Tare #	102	100	123				132	114	
A	Tare Weight	13.78	13.84	13.73				13.65	13.81	
B	Wet Soil Weight + A	23.08	23.30	23.95				18.98	19.06	
C	Dry Soil Weight + A	20.61	21.05	21.62				18.22	18.30	
D	Water Weight (B-C)	2.47	2.25	2.33				0.76	0.76	
E	Dry Soil Weight (C-A)	6.83	7.21	7.89				4.57	4.49	
F	% Moisture Content (D/E)*100	36.2%	31.2%	29.5%				16.6%	16.9%	
N	# OF DROPS	18	28	39				Moisture Contents determined by ASTM D 2216		
LL	LL = F * FACTOR									
Ave.	Average							16.8%		



One Point Liquid Limit			
N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.990	29	1.018
24	0.995	30	1.022
25	1.000		

Notes:

### Special Sampling Methods:

Sample Preparation:	Wet Preparation <input type="checkbox"/>	Dry Preparation <input checked="" type="checkbox"/>	Air Dried <input checked="" type="checkbox"/>	NP, Non-Plastic <input type="checkbox"/>
Liquid limit Test:	Multipoint Method <input checked="" type="checkbox"/>	One-point Method <input type="checkbox"/>		Liquid Limit <u>33</u>
Classification:	ASTM D 2487 <input type="checkbox"/>	AASHTO M 145 <input checked="" type="checkbox"/>		Plastic Limit <u>17</u>
Liquid limit Test:	ASTM D 4318 <input type="checkbox"/>	AASHTO T 89 <input checked="" type="checkbox"/>		Plastic Index <u>16</u>
Plastic limit Test:	ASTM D 4318 <input type="checkbox"/>	AASHTO T 90 <input checked="" type="checkbox"/>		Group Symbol <u>A-2-6</u>

Technician Name: Brian Urban

Certification #

Technical Responsibility: Trapp Harris

Signature

Staff Professional

Position



## Particle Size Analysis of Soils

ASTM D 422



Project #: 1611-04-386

Project Name: RBO South Fork Edisto River &amp; Cedar Creek

Client Name: SCDOT

Client Address: PO Box 191, Columbia, SC 29202-0191

Test Date(s): 4/13/05-4/28/05

Report Date: 5/1/05

Boring #: 5

Sample #: 13

Sample Date: Various

Location: B-5

Elevation: 53.5'-55.0'

Sample Description: Fat Clay w/ Sand (A-7-6) medium plasticity, fine to medium sand, white with orange

Particle Size Analysis / Without Hydrometer Analysis			Moisture Content		Natural
			Tare #		201
	Tare Number	201.0	A	Tare Weight	0.00
A	Tare Weight	0.0	B	Wet Weight + Tare Wt.	110.52
B	Total Sample Dry Wt. + Tare Wt.	0.0	C	Dry Weight + Tare Wt.	86.39
C	Total Sample Dry Weight (B-A)	86.39	D	Water Wt. (B-C)	24.13
D	Total Sample Wt. After #200 Wash	15.54	E	Dry Wt.(C-A)	86.39
E	Percent Passing #200 (1-D/C)x100	82.0%	Moisture Content (100 x D/E) (%)		27.9%
Sieve Size (mm)	Sieve Size	Retained Weight	Percent Retained		Percent Passing Total Sample
37.50	1.5"	0.0	0.0%		100.0%
25.00	1.0"	0.00	0.0%		100.0%
19.00	3/4"	0.00	0.0%		100.0%
12.50	1/2"	0.00	0.0%		100.0%
9.50	3/8"	0.00	0.0%		100.0%
4.75	#4	0.00	0.0%		100.0%
2.36	#8	0.07	0.1%		99.9%
1.18	#16	0.79	0.9%		99.0%
0.60	#30	1.91	2.2%		96.8%
0.30	#50	3.37	3.9%		92.9%
0.15	#100	4.38	5.1%		87.8%
0.075	#200	5.02	5.8%		82.0%

<b>Notes:</b>		Maximum Particle Size	Gravel	< 75 mm and > 4.75 mm (#4)	0.0%
		Apparent Relative Density	Coarse Sand	< 4.75 mm and > 2.00 mm (#10)	0.1%
Liquid Limit	59	Fineness Modulus	Medium Sand	< 2.00 mm and > 0.425 mm (#40)	3.1%
Plastic Limit	29	Cu = D60/D10:	Fine Sand	< 0.425 mm and > 0.075 mm (#200)	14.8%
Plastic Index	30	Cc = (D30) <sup>2</sup> / (D10xD60):	% Silt and Clay	< 0.075 mm	82.0%
			Description of Sand & Gravel	Rounded <input checked="" type="checkbox"/> Angular <input checked="" type="checkbox"/>	
			Hard & Durable <input checked="" type="checkbox"/> Soft <input type="checkbox"/> Weathered & Friable <input type="checkbox"/>		

Organic Content

D10 =

D30 =

D60 =

D50 =

D90 =

ASTM D 422: Particle Size Analysis of Soils

Hydrometer portion of test method not utilized.

ASTM D 421: Dry Preparation of Soil Samples

ASTM D 854: Specific Gravity of Soils

ASTM D 4318: Liquid Limit, Plastic Limit, &amp; Plastic Index of Soils

ASTM D 2487: Classification of Soils for Engineering Purposes (Unified Soil Classification System)

Technician Name:

Brian Urban

Certification #

Technical Responsibility:

Trapp Harris

Signature

Staff Professional

Position



## Liquid Limit, Plastic Limit, and Plastic Index

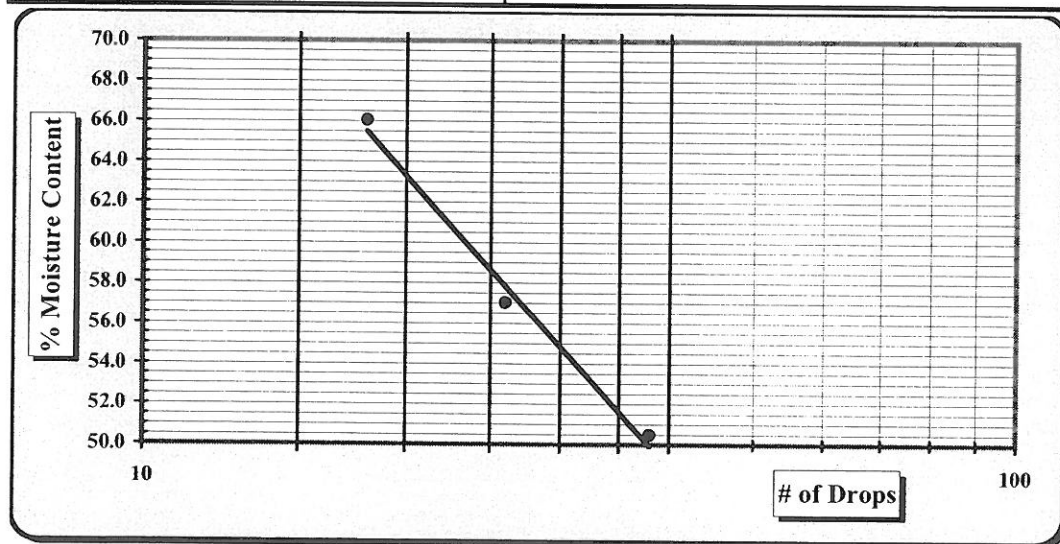
Project #: **1611-04-386**  
 Project Name: **RBO South Fork Edisto River & Cedar Creek**  
 Client Name: **SCDOT**  
 Client Address: **P.O. Box 191, Columbia, South Carolina, 29202-0191**  
 Boring #: **5** Sample #: **13**

Report Date: **4/27/05**  
 Test Date(s): **4/16/05-4/28/05**

Location: **B-5** Elevation: **53.5'-55.0'**

Sample Description: **Fat Clay w/ Sand (CH, A-7-6) medium plasticity, fine to medium sand, white with**

Pan #		Liquid Limit						Plastic Limit		
	Test #	1	2	3	4	5	6	1	2	3
	Tare #	145	8	119				141	118	
A	Tare Weight	13.61	13.57	13.57				13.55	13.71	
B	Wet Soil Weight + A	19.92	20.40	21.41				19.07	19.08	
C	Dry Soil Weight + A	17.41	17.92	18.78				17.83	17.89	
D	Water Weight (B-C)	2.51	2.48	2.63				1.24	1.19	
E	Dry Soil Weight (C-A)	3.80	4.35	5.21				4.28	4.18	
F	% Moisture Content (D/E)*100	66.1%	57.0%	50.5%				29.0%	28.5%	
N	# OF DROPS	18	26	38				Moisture Contents determined by ASTM D 2216		
LL	LL = F * FACTOR									
Ave.	Average							28.7%		



One Point Liquid Limit			
N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.990	29	1.018
24	0.995	30	1.022
25	1.000		

Notes:

### Special Sampling Methods:

Sample Preparation:	Wet Preparation <input type="checkbox"/>	Dry Preparation <input checked="" type="checkbox"/>	Air Dried <input checked="" type="checkbox"/>	NP, Non-Plastic <input type="checkbox"/>
Liquid limit Test:	Multipoint Method <input checked="" type="checkbox"/>	One-point Method <input type="checkbox"/>		Liquid Limit <u>59</u>
Classification:	ASTM D 2487 <input type="checkbox"/>	AASHTO M 145 <input checked="" type="checkbox"/>		Plastic Limit <u>29</u>
Liquid limit Test:	ASTM D 4318 <input type="checkbox"/>	AASHTO T 89 <input checked="" type="checkbox"/>		Plastic Index <u>30</u>
Plastic limit Test:	ASTM D 4318 <input type="checkbox"/>	AASHTO T 90 <input checked="" type="checkbox"/>		Group Symbol <u>A-7-6</u>

Technician Name: Brian Urban

Certification #

Technical Responsibility: Trapp Harris

Signature

Staff Professional

Position

## Particle Size Analysis of Soils

ASTM D 422



Project #: 1611-04-386

Project Name: RBO South Fork Edisto River &amp; Cedar Creek

Client Name: SCDOT

Client Address: PO Box 191, Columbia, SC 29202-0191

Test Date(s): 4/13/05-4/28/05

Report Date: 5/1/05

Boring #: 6

Sample #: 8

Sample Date:

Various

Location: B-6

Elevation:

50.0'-51.5'

Sample Description: Clayey Sand (SC, A-2-6) low plasticity, fine to medium sand, purple, white, brown, orange.

Particle Size Analysis / Without Hydrometer Analysis			Moisture Content		Natural
				Tare #	211
	Tare Number	211.0	A	Tare Weight	0.00
A	Tare Weight	0.0	B	Wet Weight + Tare Wt.	144.87
B	Total Sample Dry Wt. + Tare Wt.	0.0	C	Dry Weight + Tare Wt.	122.62
C	Total Sample Dry Weight (B-A)	122.62	D	Water Wt. (B-C)	22.25
D	Total Sample Wt. After #200 Wash	81.94	E	Dry Wt.(C-A)	122.62
E	Percent Passing #200 (1-D/C)x100	33.2%	Moisture Content (100 x D/E) (%)		18.1%
Sieve Size (mm)	Sieve Size	Retained Weight	Percent Retained		Percent Passing Total Sample
37.50	1.5"	0.0	0.0%		100.0%
25.00	1.0"	0.00	0.0%		100.0%
19.00	3/4"	0.00	0.0%		100.0%
12.50	1/2"	0.00	0.0%		100.0%
9.50	3/8"	0.00	0.0%		100.0%
4.75	#4	0.00	0.0%		100.0%
2.36	#8	0.00	0.0%		100.0%
1.18	#16	0.37	0.3%		99.7%
0.60	#30	1.63	1.3%		98.4%
0.30	#50	27.31	22.3%		76.1%
0.15	#100	46.85	38.2%		37.9%
0.075	#200	5.78	4.7%		33.2%

Notes: Maximum Particle Size		Gravel	< 75 mm and > 4.75 mm (#4)	0.0%
Apparent Relative Density		Coarse Sand	< 4.75 mm and > 2.00 mm (#10)	0.0%
Liquid Limit	31	Medium Sand	< 2.00 mm and > 0.425 mm (#40)	1.6%
Plastic Limit	18	Fine Sand	< 0.425 mm and > 0.075 mm (#200)	65.2%
Plastic Index	13	% Silt and Clay	< 0.075 mm	33.2%
		Description of Sand & Gravel	Rounded <input checked="" type="checkbox"/> Angular <input checked="" type="checkbox"/>	
		Hard & Durable <input checked="" type="checkbox"/> Soft <input type="checkbox"/> Weathered & Friable <input type="checkbox"/>		

Organic Content

D10 =

D30 =

D60 =

D50 =

D90 =

ASTM D 422: Particle Size Analysis of Soils

Hydrometer portion of test method not utilized.

ASTM D 421: Dry Preparation of Soil Samples

ASTM D 854: Specific Gravity of Soils

ASTM D 4318: Liquid Limit, Plastic Limit, &amp; Plastic Index of Soils

ASTM D 2487: Classification of Soils for Engineering Purposes (Unified Soil Classification System)

Technician Name:

Brian Urban

Certification #

Technical Responsibility:

Trapp Harris

Signature

Staff Professional

Position



## Liquid Limit, Plastic Limit, and Plastic Index

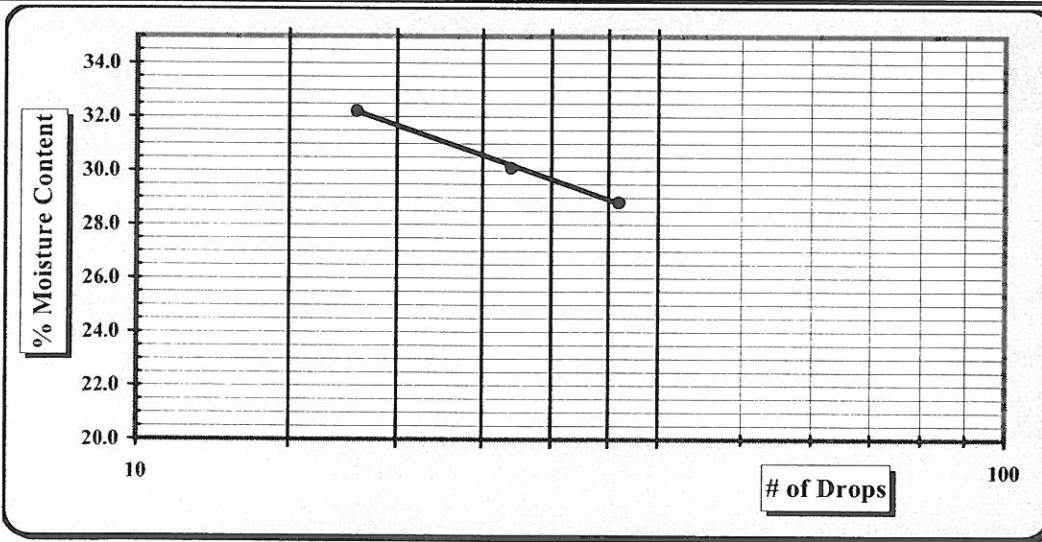
Project #: **1611-04-386**  
 Project Name: **RBO South Fork Edisto River & Cedar Creek**  
 Client Name: **SCDOT**  
 Client Address: **P.O. Box 191, Columbia, South Carolina, 29202-0191**  
 Boring #: **6** Sample #: **8** Sample Date: **Various**

Report Date: **4/27/05**  
 Test Date(s): **4/16/05-4/28/05**

Location: **B-6** Elevation: **50.0'-51.5'**

Sample Description: **Clayey Sand (SC, A-2-6) low plasticity, fine to medium sand, purple, white, brown,**

Pan #		Liquid Limit						Plastic Limit		
	Test #	1	2	3	4	5	6	1	2	3
	Tare #	135	128	105				115	111	
A	Tare Weight	13.57	13.73	13.63				13.83	13.58	
B	Wet Soil Weight + A	24.94	25.40	24.09				19.35	19.54	
C	Dry Soil Weight + A	22.17	22.70	21.75				18.53	18.64	
D	Water Weight (B-C)	2.77	2.70	2.34				0.82	0.90	
E	Dry Soil Weight (C-A)	8.60	8.97	8.12				4.70	5.06	
F	% Moisture Content (D/E)*100	32.2%	30.1%	28.8%				17.4%	17.8%	
N	# OF DROPS	18	27	36				Moisture Contents determined by ASTM D 2216		
LL	LL = F * FACTOR									
Ave.	Average							17.6%		



One Point Liquid Limit

N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.990	29	1.018
24	0.995	30	1.022
25	1.000		

Notes:

Special Sampling Methods:

Sample Preparation:	Wet Preparation <input type="checkbox"/>	Dry Preparation <input checked="" type="checkbox"/>	Air Dried <input checked="" type="checkbox"/>	NP, Non-Plastic <input type="checkbox"/>
Liquid limit Test:	Multipoint Method <input checked="" type="checkbox"/>	One-point Method <input type="checkbox"/>		Liquid Limit <u>31</u>
Classification:	ASTM D 2487 <input type="checkbox"/>	AASHTO M 145 <input checked="" type="checkbox"/>		Plastic Limit <u>18</u>
Liquid limit Test:	ASTM D 4318 <input type="checkbox"/>	AASHTO T 89 <input checked="" type="checkbox"/>		Plastic Index <u>13</u>
Plastic limit Test:	ASTM D 4318 <input type="checkbox"/>	AASHTO T 90 <input checked="" type="checkbox"/>		Group Symbol <u>A-2-6</u>

Technician Name: Brian Urban

Certification #

Technical Responsibility: Trapp Harris

Signature

Staff Professional

Position



## Particle Size Analysis of Soils

ASTM D 422



Project #: 1611-04-386

Project Name: RBO South Fork Edisto River &amp; Cedar Creek

Client Name: SCDOT

Client Address: PO Box 191, Columbia, SC 29202-0191

Test Date(s): 4/13/05-4/28/05

Report Date: 5/1/05

Boring #: 6

Sample #: 11

Sample Date: Various

Location: B-6

Elevation: 65.0'-66.5'

Sample Description: Silty Sand (SM, A-2-4) low plasticity, fine to medium sand, white

Particle Size Analysis / Without Hydrometer Analysis			Moisture Content		Natural
	Tare Number	206.0	A	Tare #	206
A	Tare Weight	0.0	B	Tare Weight	0.00
B	Total Sample Dry Wt. + Tare Wt.	0.0	C	Wet Weight + Tare Wt.	159.84
C	Total Sample Dry Weight (B-A)	129.94	D	Dry Weight + Tare Wt.	129.94
D	Total Sample Dry Weight (B-A)	129.94	E	Water Wt. (B-C)	29.90
E	Total Sample Wt. After #200 Wash	112.26		Dry Wt.(C-A)	129.94
	Percent Passing #200 (1-D/C)x100	13.6%		Moisture Content (100 x D/E) (%)	23.0%
Sieve Size (mm)	Sieve Size	Retained Weight	Percent Retained		Percent Passing Total Sample
37.50	1.5"	0.0	0.0%		100.0%
25.00	1.0"	0.00	0.0%		100.0%
19.00	3/4"	0.00	0.0%		100.0%
12.50	1/2"	0.00	0.0%		100.0%
9.50	3/8"	0.00	0.0%		100.0%
4.75	#4	0.00	0.0%		100.0%
2.36	#8	0.40	0.3%		99.7%
1.18	#16	4.66	3.6%		96.1%
0.60	#30	38.44	29.6%		66.5%
0.30	#50	51.52	39.6%		26.9%
0.15	#100	13.11	10.1%		16.8%
0.075	#200	4.13	3.2%		13.6%

Notes:		Maximum Particle Size	Gravel	< 75 mm and > 4.75 mm (#4)	0.0%
		Apparent Relative Density	Coarse Sand	< 4.75 mm and > 2.00 mm (#10)	0.3%
Liquid Limit	28	Fineness Modulus	Medium Sand	< 2.00 mm and > 0.425 mm (#40)	33.2%
Plastic Limit	22	Cu = D60/D10:	Fine Sand	< 0.425 mm and > 0.075 mm (#200)	52.9%
Plastic Index	6	Cc = (D30) <sup>2</sup> / (D10xD60):	% Silt and Clay	< 0.075 mm	13.6%
			Description of Sand & Gravel	Rounded <input checked="" type="checkbox"/> Angular <input checked="" type="checkbox"/>	
			Hard & Durable <input checked="" type="checkbox"/> Soft <input type="checkbox"/> Weathered & Friable <input type="checkbox"/>		

Organic Content

D10 =

D30 =

D60 =

D50 =

D90 =

ASTM D 422: Particle Size Analysis of Soils

ASTM D 421: Dry Preparation of Soil Samples

ASTM D 4318: Liquid Limit, Plastic Limit, &amp; Plastic Index of Soils

ASTM D 2487: Classification of Soils for Engineering Purposes (Unified Soil Classification System)

Hydrometer portion of test method not utilized.

ASTM D 854: Specific Gravity of Soils

Technician Name:

Brian Urban

Certification #

Technical Responsibility:

Trapp Harris

Signature

Staff Professional

Position





## Liquid Limit, Plastic Limit, and Plastic Index

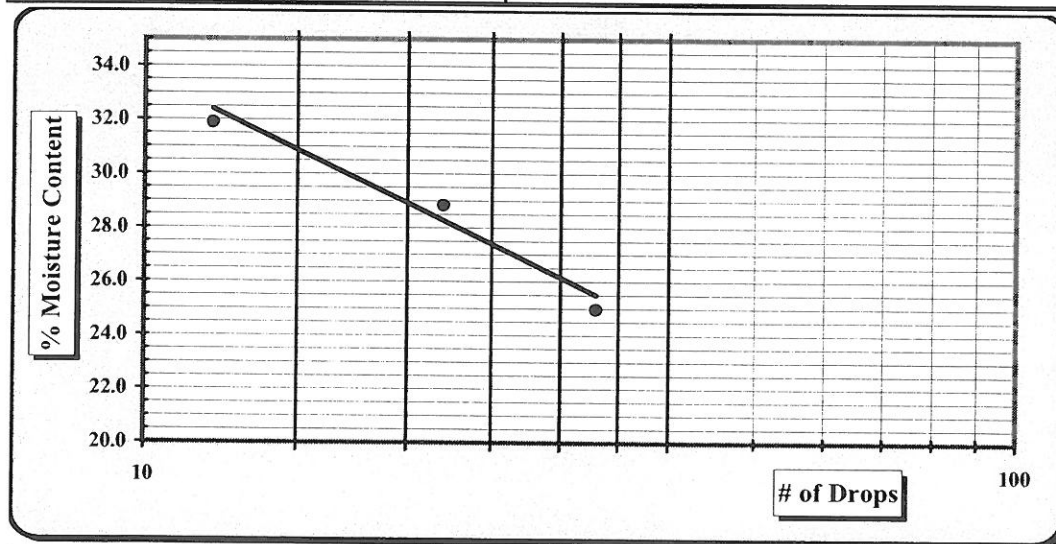
Project #: **1611-04-386**  
 Project Name: **RBO South Fork Edisto River & Cedar Creek**  
 Client Name: **SCDOT**  
 Client Address: **P.O. Box 191, Columbia, South Carolina, 29202-0191**  
 Boring #: **6** Sample #: **11**

Report Date: **4/27/05**  
 Test Date(s): **4/16/05-4/28/05**

Location: **B-6** Elevation: **65.0'-66.5'**

Sample Description: **Silty Sand (SM, A-2-4) low plasticity, fine to medium sand, white**

Pan #	Test #	Liquid Limit						Plastic Limit		
		1	2	3	4	5	6	1	2	3
	Tare #	126	104	116				122	134	
A	Tare Weight	13.77	13.72	13.70				13.75	13.74	
B	Wet Soil Weight + A	22.54	22.12	23.21				18.76	19.64	
C	Dry Soil Weight + A	20.42	20.24	21.31				17.86	18.60	
D	Water Weight (B-C)	2.12	1.88	1.90				0.90	1.04	
E	Dry Soil Weight (C-A)	6.65	6.52	7.61				4.11	4.86	
F	% Moisture Content (D/E)*100	31.9%	28.8%	25.0%				21.9%	21.4%	
N	# OF DROPS	12	22	33				Moisture Contents determined by ASTM D 2216		
LL	LL = F * FACTOR									
Ave.	Average							21.6%		



One Point Liquid Limit			
N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.990	29	1.018
24	0.995	30	1.022
25	1.000		

Notes:

### Special Sampling Methods:

Sample Preparation:	Wet Preparation <input type="checkbox"/>	Dry Preparation <input checked="" type="checkbox"/>	Air Dried <input checked="" type="checkbox"/>	NP, Non-Plastic <input type="checkbox"/>
Liquid limit Test:	Multipoint Method <input checked="" type="checkbox"/>	One-point Method <input type="checkbox"/>		Liquid Limit <u>28</u>
Classification:	ASTM D 2487 <input type="checkbox"/>	AASHTO M 145 <input checked="" type="checkbox"/>		Plastic Limit <u>22</u>
Liquid limit Test:	ASTM D 4318 <input type="checkbox"/>	AASHTO T 89 <input checked="" type="checkbox"/>		Plastic Index <u>6</u>
Plastic limit Test:	ASTM D 4318 <input type="checkbox"/>	AASHTO T 90 <input checked="" type="checkbox"/>		Group Symbol <u>A-2-4</u>

Technician Name: Brian Urban

Certification #

Technical Responsibility: Trapp Harris

Signature

Staff Professional

Position

## Particle Size Analysis of Soils

ASTM D 422



Project #: 1611-04-386

Project Name: RBO South Fork Edisto River &amp; Cedar Creek

Client Name: SCDOT

Client Address: PO Box 191, Columbia, SC 29202-0191

Test Date(s): 4/13/05-4/28/05

Report Date: 5/1/05

Boring #: 6

Sample #: 15

Sample Date: Various

Location: B-6

Elevation: 85.0'-86.5'

Sample Description: Silty Sand (SM, A-2-6) low plasticity, fine to medium sand, brown and white

Particle Size Analysis / Without Hydrometer Analysis			Moisture Content		Natural
	Tare Number	302.0	A	Tare Weight	0.00
A	Tare Weight	0.0	B	Wet Weight + Tare Wt.	185.99
B	Total Sample Dry Wt. + Tare Wt.	0.0	C	Dry Weight + Tare Wt.	149.56
C	Total Sample Dry Weight (B-A)	149.56	D	Water Wt. (B-C)	36.43
D	Total Sample Wt. After #200 Wash	117.74	E	Dry Wt.(C-A)	149.56
E	Percent Passing #200 (1-D/C)x100	21.3%	Moisture Content (100 x D/E) (%)		24.4%
Sieve Size (mm)	Sieve Size	Retained Weight	Percent Retained		Percent Passing Total Sample
37.50	1.5"	0.0	0.0%		100.0%
25.00	1.0"	0.00	0.0%		100.0%
19.00	3/4"	0.00	0.0%		100.0%
12.50	1/2"	0.00	0.0%		100.0%
9.50	3/8"	0.00	0.0%		100.0%
4.75	#4	0.32	0.2%		99.8%
2.36	#8	2.22	1.5%		98.3%
1.18	#16	8.19	5.5%		92.8%
0.60	#30	39.82	26.6%		66.2%
0.30	#50	46.49	31.1%		35.1%
0.15	#100	13.79	9.2%		25.9%
0.075	#200	6.91	4.6%		21.3%

Notes:		Maximum Particle Size	Gravel	< 75 mm and > 4.75 mm (#4)	0.2%
		Apparent Relative Density	Coarse Sand	< 4.75 mm and > 2.00 mm (#10)	1.5%
Liquid Limit	40	Fineness Modulus	Medium Sand	< 2.00 mm and > 0.425 mm (#40)	32.1%
Plastic Limit	26	Cu = D60/D10:	Fine Sand	< 0.425 mm and > 0.075 mm (#200)	44.9%
Plastic Index	14	Cc = (D30) <sup>2</sup> / (D10xD60):	% Silt and Clay	< 0.075 mm	21.3%
			Description of Sand & Gravel	Rounded <input checked="" type="checkbox"/> Angular <input checked="" type="checkbox"/>	
			Hard & Durable <input checked="" type="checkbox"/> Soft <input type="checkbox"/>	Weathered & Friable <input type="checkbox"/>	

Organic Content

D10 =

D30 =

D60 =

D50 =

D90 =

ASTM D 422: Particle Size Analysis of Soils

Hydrometer portion of test method not utilized.

ASTM D 421: Dry Preparation of Soil Samples

ASTM D 854: Specific Gravity of Soils

ASTM D 4318: Liquid Limit, Plastic Limit, &amp; Plastic Index of Soils

ASTM D 2487: Classification of Soils for Engineering Purposes (Unified Soil Classification System)

Technician Name:

Brian Urban

Certification #

Technical Responsibility:

Trapp Harris

Signature

Staff Professional

Position



## Liquid Limit, Plastic Limit, and Plastic Index

Project #: **1611-04-386**  
 Project Name: **RBO South Fork Edisto River & Cedar Creek**  
 Client Name: **SCDOT**  
 Client Address: **P.O. Box 191, Columbia, South Carolina, 29202-0191**

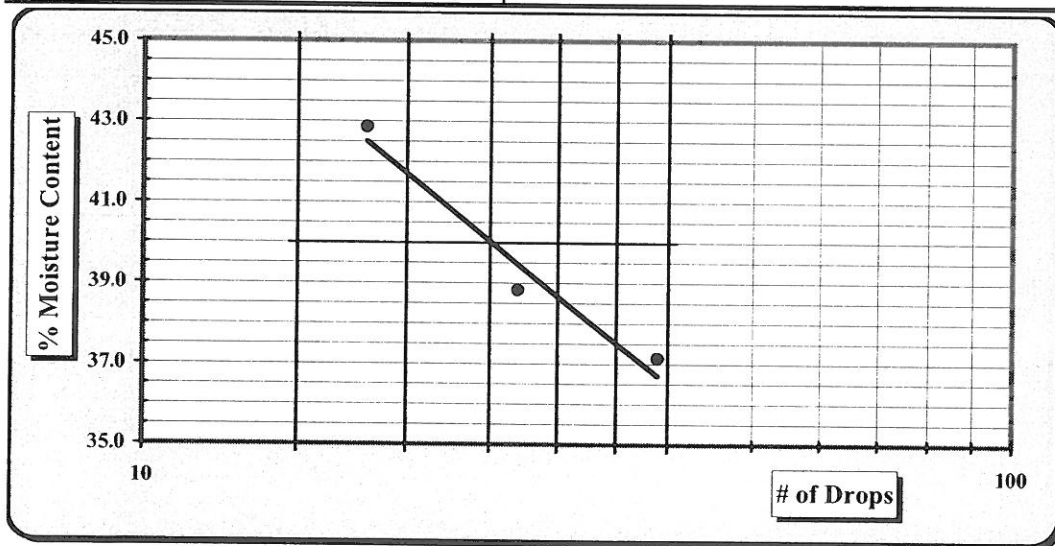
Report Date: **4/27/05**  
 Test Date(s): **4/16/05-4/28/05**

Boring #: **6** Sample #: **15** Sample Date: **Various**

Location: **B-6** Elevation: **85.0'-86.5'**

Sample Description: **Silty Sand (SM, A-2-6) low plasticity, fine to medium sand, brown and white**

Pan #		Liquid Limit						Plastic Limit		
	Test #	1	2	3	4	5	6	1	2	3
	Tare #	136	137	138				143	108	
A	Tare Weight	13.76	13.74	13.84				13.72	13.38	
B	Wet Soil Weight + A	23.36	22.50	23.92				19.10	18.52	
C	Dry Soil Weight + A	20.48	20.05	21.19				17.98	17.46	
D	Water Weight (B-C)	2.88	2.45	2.73				1.12	1.06	
E	Dry Soil Weight (C-A)	6.72	6.31	7.35				4.26	4.08	
F	% Moisture Content (D/E)*100	42.9%	38.8%	37.1%				26.3%	26.0%	
N	# OF DROPS	18	27	39				Moisture Contents determined by ASTM D 2216		
LL	LL = F * FACTOR									
Ave.	Average							26.1%		



One Point Liquid Limit			
N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.990	29	1.018
24	0.995	30	1.022
25	1.000		

Notes:

### Special Sampling Methods:

Sample Preparation:	Wet Preparation <input type="checkbox"/>	Dry Preparation <input checked="" type="checkbox"/>	Air Dried <input checked="" type="checkbox"/>	NP, Non-Plastic <input type="checkbox"/>
Liquid limit Test:	Multipoint Method <input checked="" type="checkbox"/>	One-point Method <input type="checkbox"/>		Liquid Limit <u>40</u>
Classification:	ASTM D 2487 <input type="checkbox"/>	AASHTO M 145 <input checked="" type="checkbox"/>		Plastic Limit <u>26</u>
Liquid limit Test:	ASTM D 4318 <input type="checkbox"/>	AASHTO T 89 <input checked="" type="checkbox"/>		Plastic Index <u>14</u>
Plastic limit Test:	ASTM D 4318 <input type="checkbox"/>	AASHTO T 90 <input checked="" type="checkbox"/>		Group Symbol <u>A-2-6</u>

Technician Name: Brian Urban

Certification #

Technical Responsibility: Trapp Harris

Signature

Staff Professional

Position



# Particle Size Analysis of Soils

Laboratory Record Version 4.0

Report Date:

4/29/05

Project #: 1611-04-386  
Project Name: RBO South Fork Edisto River & Cedar Creek  
Client Name: SCDOT  
Client Address: P.O. Box 191, Columbia, South Carolina, 29202-0191  
Boring #: 7  
Sample #: 1  
Location: B-7  
Sample Date: Various  
Elevation: 16.0'-17.5  
Test Date(s): 4/13/05-4/28/05  
Liquid Limit: 21  
Plastic Limit: 18  
Plastic Index: 3

Client Address: P.O. Box 191, Columbia, South Carolina, 29202-0191				Boring #: 7				Sample #: 1				Sample Date: Various				Sieve		Retained Wt.		Percent Passing	
Location: B-7				Offset:				Sample Description: Silty Sand (SM, A-2-4) low plasticity, fine to medium sand, tan				Elevation: 16.0'-17.5				3.0"		0.0		100.0%	
Pan #: 10				Beaker #: 10				Specific Gravity: 2.588								1.5"		0.0		100.0%	
Hydrometer Jar #:				Pan # (washed sample):				Moisture Content				Hygroscopic				1.0"		0.0		100.0%	
Pan Tare Weight (grams):				Tare #								Natural								Soil Mortar (portion passing the #10 sieve)	
Total Sample Wet Wt. + tare wt. (grams):				A				Tare Wt.													
Weight of Total Sample Air Dried:				B				Wet Wt. + A													
Weight of Air Dried Hydrometer Sample (g):				C				Dry Wt. + A													
Total Sample Oven Dried:				D				Water Wt. (B-C)													
Hydrometer Sample Oven Dried (W):				E				Dry Wt.(C-A)													
% Passing #10:								% Moisture (100 x D/E)													
Correction Factor a (Table 1):				1.02												#100		31.7		72.4%	
																#200		86.5		24.8%	

Notes:											
Description of Sand & Gravel Particles:											
Maximum Particle Size:											
% Gravel: 0.0%											
Coarse Sand: 0.0%											
Medium Sand: 0.8%											
Fine Sand: 74.4%											

Time	Temp.	Hydrometer	Reading	Corrections		Hydrometer	Percent Passing		Table 2	Table 3		Diameter D = K x (L/T) <sup>1/2</sup>
				Control Cylinder	Composite Correction		P(-#10) = (R x a / W) x 100	P (total) = P x % Passing #10		L	K	
12:12	23.1	20.0	20.0	4.0	3.0	16.0	14.2%	14.2%	13.7	0.01358	0.03554	0.03554
12:15	23.1	19.0	19.0	4.0	3.0	15.0	13.3%	13.3%	13.8	0.01358	0.02256	0.02256
12:25	23.1	18.0	18.0	4.0	3.0	14.0	12.4%	12.4%	14.0	0.01358	0.01312	0.01312
12:40	23.0	17.0	17.0	4.0	3.0	13.0	11.5%	11.5%	14.2	0.01358	0.00934	0.00934
13:10	22.9	16.0	16.0	4.0	3.2	12.0	10.6%	10.6%	14.3	0.01374	0.00671	0.00671
16:20	21.6	15.0	15.0	4.0	3.5	11.0	9.8%	9.8%	14.5	0.01391	0.00335	0.00335
12:10	22.0	12.0	12.0	4.0	3.3	8.0	7.1%	7.1%	15.0	0.01374	0.00140	0.00140
12:10	22.0	11.0	11.0	4.0	3.3	7.0	6.2%	6.2%	15.2	0.01374	0.00100	0.00100

References:											
Brian Urban											
ASTM D 421: Dry Preparation of Soil Samples											
ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass											
ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils											
ASTM D 2487: Classification of Soils for Engineering Purposes (Unified Soil Classification System)											
Technical Responsibility: Trapp Harris											
Position: Staff Professional											



# Particle Size Analysis of Soils

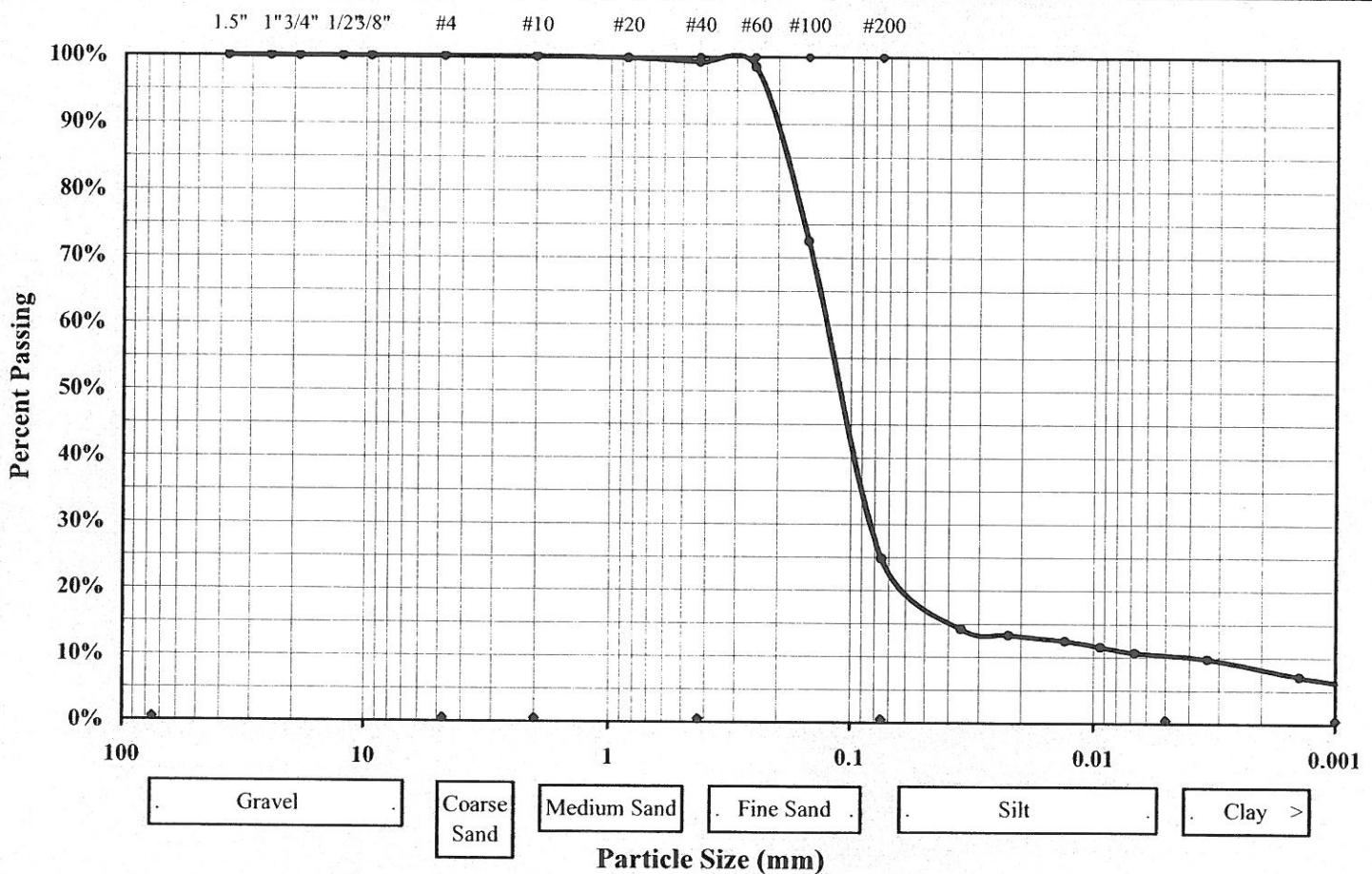
ASTM D 422



S&ME Project #: **1611-04-386**  
 Project Name: **RBO South Fork Edisto River & Cedar Creek**  
 Client Name: **SCDOT**  
 Client Address: **P.O. Box 191, Columbia, South Carolina, 29202-0191**

Report Date: **4/29/05**  
 Test Date(s): **4/13/05-4/28/05**

Boring #: **7** Sample #: **1** Sample Date: **Various**  
 Location: **B-7** Offset:  Elevation: **16.0'-17.5'**  
 Sample Description: **Silty Sand (SM, A-2-4) low plasticity, fine to medium sand, tan**



Moisture Content		Gravel	0.0%	Liquid Limit	21
Silt & Clay (% Passing #200)	24.8%	Sand	75.2%	Plastic Limit	18
Maximum Particle Size	0	Silt	14.8%	Plastic Index	3
Specific Gravity	2.588	Clay	10.0%	Colloids	6.0%

Description of Sand & Gravel Particles: Rounded ☒ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐  
 ASTM D 422: Particle Size Analysis of Soils  
 Dispersing Agent: Sodium Hexametaphosphate: 40 g./ Liter  
 Mechanical Stirring Apparatus (A) Length of Dispersion Period: 1 min.

**References:** ASTM D 854: Specific Gravity of Soils  
 ASTM D 421: Dry Preparation of Soil Samples  
 ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass  
 ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils  
 ASTM D 2487: Classification of Soils for Engineering Purposes (Unified Soil Classification System)

Technical Responsibility / Position: **Trapp Harris**

Staff Professional





# SPECIFIC GRAVITY OF SOILS

Test Method A

## ASTM D-854

PROJECT NO 1611-05-386 BORING NO B-7  
 PROJECT NAME RBO South Fork Edisto & Cedar Creek SAMPLE NO 1  
 DATE 4/21/2005 DEPTH 16.0'-17.5'  
 DESCRIPTION Silty Sand (SM, A-2-4) low plasticity, fine sand, tan  
 TESTED BY BU COMPUTED BY BU CHECKED BY BU

VOL FLASK NO <u>3</u>	VOL FLASK NO <u>          </u>	VOL FLASK NO <u>          </u>
1. WT. OF SOIL & VOL FLASK <u>85.06</u> g	1. WT. OF SOIL & VOL FLASK <u>          </u> g	1. WT. OF SOIL & VOL FLASK <u>          </u> g
2. Wt. of flask <u>64.61</u> g	2. Wt. of flask <u>          </u> g	2. Wt. of flask <u>          </u> g
A. WT. OF SOIL <u>20.45</u> g	A. WT. OF SOIL <u>0</u> g	A. WT. OF SOIL <u>          </u> g
B. WT. OF VOL. (from vol. Flask chart) FLASK & WATER <u>164.266</u> g	B. WT. OF VOL. (from vol. Flask chart) FLASK & WATER <u>          </u> g	B. WT. OF VOL. (from vol. Flask chart) FLASK & WATER <u>          </u> g
WATER TEM <u>28</u> °C	WATER TEMP. <u>          </u> °C	WATER TEMP. <u>          </u> °C
C. WT. OF VOL. FLASK, SOIL & WATER <u>176.83</u> g	C. WT. OF VOL. FLASK, SOIL & WATER <u>          </u> g	C. WT. OF VOL. FLASK, SOIL & WATER <u>          </u> g
D. SPECIFIC GRAVITY = <u>A</u> = <u>2.593</u> g	D. SPECIFIC GRAVITY = <u>A</u> = <u>          </u> g	D. SPECIFIC GRAVITY = <u>A</u> = <u>          </u> g
A+(B-C)	A+(B-C)	A+(B-C)

SPECIFIC GRAVITY (CORRECTED)  $G_s = D \cdot K =$

H <sub>2</sub> O TEMP. °C	CORRECTION FACTOR, K
18	1.0004
19	1.0002
20	1.0000
21	0.9998
22	0.9996
23	0.9993
24	0.9991
25	0.9989
26	0.9986
27	0.9983
28	0.9980
29	0.9977
30	0.9974

FLASK NO. 3  
 $G_s = D \cdot K$  2.588

FLASK NO. 0  
 $G_s = D \cdot K$            

FLASK NO. 0  
 $G_s = D \cdot K$            

AVERAGE

$G_s =$  **2.588**

## Particle Size Analysis of Soils

ASTM D 422



Project #: 1611-04-386

Project Name: RBO South Fork Edisto River &amp; Cedar Creek

Client Name: SCDOT

Client Address: PO Box 191, Columbia, South Carolina, 29202-0191

Test Date(s): 4/13/05-4/28/05

Report Date: 5/1/05

Boring #: 7

Sample #: 1

Sample Date: Various

Location: B-7

Elevation: 16.0'-17.5'

Sample Description: Silty Sand (SM, A-2-4) low plasticity, fine sand, tan

Particle Size Analysis / Without Hydrometer Analysis			Moisture Content		Natural
				Tare #	10
	Tare Number	10.0	A	Tare Weight	0.00
A	Tare Weight	0.0	B	Wet Weight + Tare Wt.	19.81
B	Total Sample Dry Wt. + Tare Wt.	0.0	C	Dry Weight + Tare Wt.	15.98
C	Total Sample Dry Weight (B-A)	115.60	D	Water Wt. (B-C)	3.83
D	Total Sample Wt. After #200 Wash	86.50	E	Dry Wt.(C-A)	15.98
E	Percent Passing #200 (1-D/C)x100	25.2%	Moisture Content (100 x D/E) (%)		24.0%
Sieve Size (mm)	Sieve Size	Retained Weight	Percent Retained		Percent Passing Total Sample
37.50	1.5"	0.0	0.0%		100.0%
25.00	1.0"	0.00	0.0%		100.0%
19.00	3/4"	0.00	0.0%		100.0%
12.50	1/2"	0.00	0.0%		100.0%
9.50	3/8"	0.00	0.0%		100.0%
4.75	#4	0.00	0.0%		100.0%
2.36	#8	0.00	0.0%		100.0%
1.18	#16	0.10	0.1%		99.9%
0.60	#30	0.10	0.1%		99.8%
0.30	#50	1.50	1.3%		98.5%
0.15	#100	30.00	26.0%		72.6%
0.075	#200	54.80	47.4%		25.2%

<b>Notes:</b>		Maximum Particle Size	Gravel	< 75 mm and > 4.75 mm (#4)	0.0%
		Apparent Relative Density	Coarse Sand	< 4.75 mm and > 2.00 mm (#10)	0.0%
Liquid Limit	21	Fineness Modulus	Medium Sand	< 2.00 mm and > 0.425 mm (#40)	0.2%
Plastic Limit	18	Cu = D60/D10:	Fine Sand	< 0.425 mm and > 0.075 mm (#200)	74.7%
Plastic Index	3	Cc = (D30) <sup>2</sup> / (D10x D60):	% Silt and Clay	< 0.075 mm	25.2%
			Description of Sand & Gravel	Rounded <input checked="" type="checkbox"/> Angular <input checked="" type="checkbox"/>	
			Hard & Durable <input checked="" type="checkbox"/> Soft <input type="checkbox"/> Weathered & Friable <input type="checkbox"/>		

Organic Content

D10 =

D30 =

D60 =

D50 =

D90 =

ASTM D 422: Particle Size Analysis of Soils

Hydrometer portion of test method not utilized.

ASTM D 421: Dry Preparation of Soil Samples

ASTM D 854: Specific Gravity of Soils

ASTM D 4318: Liquid Limit, Plastic Limit, &amp; Plastic Index of Soils

ASTM D 2487: Classification of Soils for Engineering Purposes (Unified Soil Classification System)

Technician Name:

Brian Urban

Certification #

Technical Responsibility:

Trapp Harris

Signature

Staff Professional

Position



## Liquid Limit, Plastic Limit, and Plastic Index

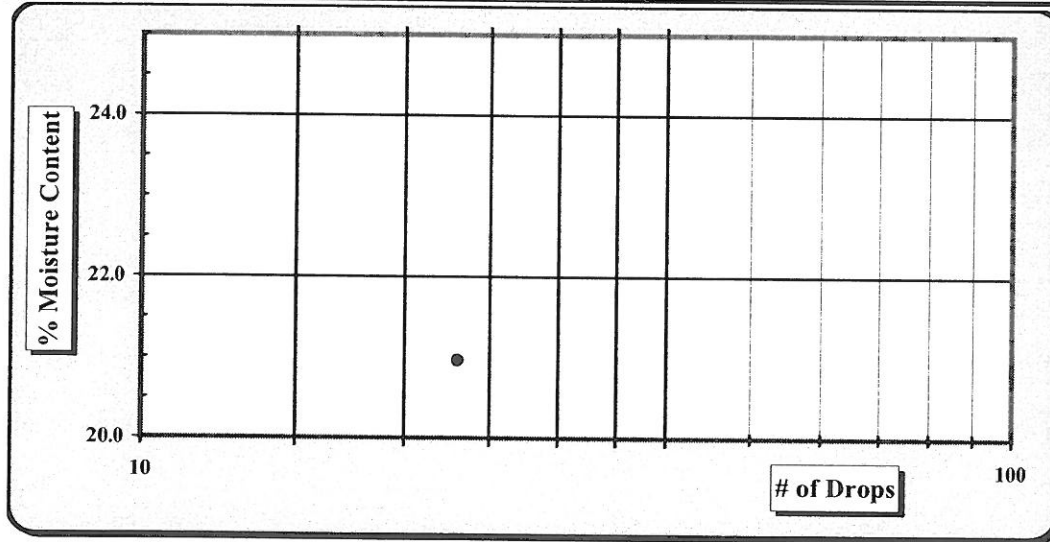
Project #: **1611-04-386**  
 Project Name: RBO South Fork Edisto River & Cedar Creek  
 Client Name: SCDOT  
 Client Address: P.O. Box 191, Columbia, South Carolina, 29202-0191  
 Boring #: 7 Sample #: 1

Report Date: 4/26/05  
 Test Date(s): 4/16/05-4/28/05

Location: B-7 Elevation: 16.0'-17.5'

Sample Description: Silty Sand (SM, A-2-4) low plasticity, fine sand, tan

Pan #		Liquid Limit						Plastic Limit		
	Test #	1	2	3	4	5	6	1	2	3
	Tare #		L					44		
A	Tare Weight		11.54					11.73		
B	Wet Soil Weight + A		19.85					14.75		
C	Dry Soil Weight + A		18.41					14.28		
D	Water Weight (B-C)		1.44					0.47		
E	Dry Soil Weight (C-A)		6.87					2.55		
F	% Moisture Content (D/E)*100		21.0%					18.4%		
N	# OF DROPS		23					Moisture Contents determined by ASTM D 2216		
LL	LL = F * FACTOR		20.8%							
Ave.	Average							18.4%		



One Point Liquid Limit			
N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.990	29	1.018
24	0.995	30	1.022
25	1.000		

Notes:

### Special Sampling Methods:

Sample Preparation:	Wet Preparation <input type="checkbox"/>	Dry Preparation <input checked="" type="checkbox"/>	Air Dried <input checked="" type="checkbox"/>	NP, Non-Plastic <input type="checkbox"/>
Liquid limit Test:	Multipoint Method <input checked="" type="checkbox"/>	One-point Method <input type="checkbox"/>		Liquid Limit 21
Classification:	ASTM D 2487 <input type="checkbox"/>	AASHTO M 145 <input checked="" type="checkbox"/>		Plastic Limit 18
Liquid limit Test:	ASTM D 4318 <input type="checkbox"/>	AASHTO T 89 <input checked="" type="checkbox"/>		Plastic Index 3
Plastic limit Test:	ASTM D 4318 <input type="checkbox"/>	AASHTO T 90 <input checked="" type="checkbox"/>		Group Symbol A-2-4

Technician Name: Brian Urban

Certification #

Technical Responsibility: Trapp Harris

Signature

Staff Professional

Position

## Particle Size Analysis of Soils

ASTM D 422



Project #: 1611-04-386

Project Name: RBO South Fork Edisto River &amp; Cedar Creek

Client Name: SCDOT

Client Address: PO Box 191, Columbia, SC 29202-0191

Test Date(s): 4/13/05-4/28/05

Report Date: 5/1/05

Boring #: 7

Sample #: 11

Sample Date: Various

Location: B-7

Elevation: 66.0'-67.5'

Sample Description: Silty Sand (SM, A-2-4) low plasticity, fine to medium sand, white

Particle Size Analysis / Without Hydrometer Analysis			Moisture Content		Natural
				Tare #	309
	Tare Number	309.0	A	Tare Weight	0.00
A	Tare Weight	0.0	B	Wet Weight + Tare Wt.	158.42
B	Total Sample Dry Wt. + Tare Wt.	0.0	C	Dry Weight + Tare Wt.	129.70
C	Total Sample Dry Weight (B-A)	129.70	D	Water Wt. (B-C)	28.72
D	Total Sample Wt. After #200 Wash	110.40	E	Dry Wt.(C-A)	129.70
E	Percent Passing #200 (1-D/C)x100	14.9%	Moisture Content (100 x D/E) (%)		22.1%
Sieve Size (mm)	Sieve Size	Retained Weight	Percent Retained		Percent Passing Total Sample
37.50	1.5"	0.0	0.0%		100.0%
25.00	1.0"	0.00	0.0%		100.0%
19.00	3/4"	0.00	0.0%		100.0%
12.50	1/2"	0.00	0.0%		100.0%
9.50	3/8"	0.00	0.0%		100.0%
4.75	#4	0.00	0.0%		100.0%
2.36	#8	0.34	0.3%		99.7%
1.18	#16	4.32	3.3%		96.4%
0.60	#30	20.37	15.7%		80.7%
0.30	#50	51.73	39.9%		40.8%
0.15	#100	28.69	22.1%		18.7%
0.075	#200	4.95	3.8%		14.9%

<b>Notes:</b>		Maximum Particle Size	Gravel	< 75 mm and > 4.75 mm (#4)	0.0%
		Apparent Relative Density	Coarse Sand	< 4.75 mm and > 2.00 mm (#10)	0.3%
Liquid Limit	28	Fineness Modulus	Medium Sand	< 2.00 mm and > 0.425 mm (#40)	19.0%
Plastic Limit	22	Cu = D60/D10:	Fine Sand	< 0.425 mm and > 0.075 mm (#200)	65.8%
Plastic Index	6	Cc = (D30) <sup>2</sup> / (D10 x D60):	% Silt and Clay	< 0.075 mm	14.9%
			Description of Sand & Gravel	Rounded <input checked="" type="checkbox"/> Angular <input checked="" type="checkbox"/>	
			Hard & Durable <input checked="" type="checkbox"/> Soft <input type="checkbox"/> Weathered & Friable <input type="checkbox"/>		

Organic Content

D10 =

D30 =

D60 =

D50 =

D90 =

ASTM D 422: Particle Size Analysis of Soils

Hydrometer portion of test method not utilized.

ASTM D 421: Dry Preparation of Soil Samples

ASTM D 854: Specific Gravity of Soils

ASTM D 4318: Liquid Limit, Plastic Limit, &amp; Plastic Index of Soils

ASTM D 2487: Classification of Soils for Engineering Purposes (Unified Soil Classification System)

Technician Name:

Brian Urban

Certification #

Technical Responsibility:

Trapp Harris

Signature

Staff Professional

Position



## Liquid Limit, Plastic Limit, and Plastic Index

Project #: **1611-04-386**  
 Project Name: **RBO South Fork Edisto River & Cedar Creek**  
 Client Name: **SCDOT**  
 Client Address: **P.O. Box 191, Columbia, South Carolina, 29202-0191**

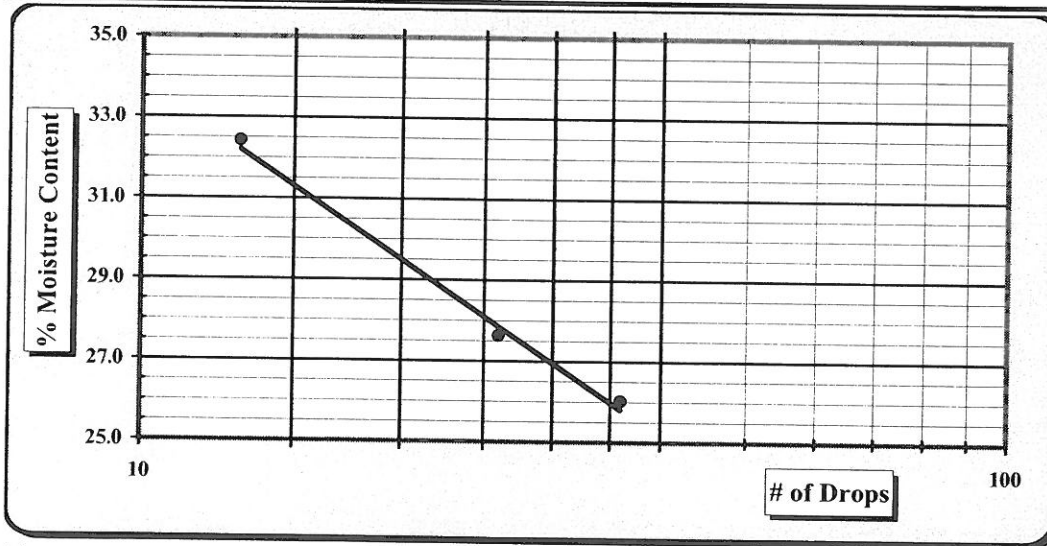
Report Date: **4/26/05**  
 Test Date(s): **4/16/05-4/28/05**

Boring #: **7** Sample #: **11** Sample Date: **Various**

Location: **B-7** Elevation: **66.0'-67.5'**

Sample Description: **Silty Sand (SM, A-2-4) low plasticity, fine to medium sand, white**

Pan #		Liquid Limit						Plastic Limit		
	Test #	1	2	3	4	5	6	1	2	3
	Tare #	8	26	4				140	71	
A	Tare Weight	14.24	14.19	14.41				14.09	17.07	
B	Wet Soil Weight + A	22.00	22.09	25.21				20.51	23.41	
C	Dry Soil Weight + A	20.10	20.38	22.98				19.37	22.24	
D	Water Weight (B-C)	1.90	1.71	2.23				1.14	1.17	
E	Dry Soil Weight (C-A)	5.86	6.19	8.57				5.28	5.17	
F	% Moisture Content (D/E)*100	32.4%	27.6%	26.0%				21.6%	22.6%	
N	# OF DROPS	13	26	36				Moisture Contents determined by ASTM D 2216		
LL	LL = F * FACTOR									
Ave.	Average							22.1%		



One Point Liquid Limit			
N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.990	29	1.018
24	0.995	30	1.022
25	1.000		

Notes:

### Special Sampling Methods:

Sample Preparation:	Wet Preparation <input type="checkbox"/>	Dry Preparation <input checked="" type="checkbox"/>	Air Dried <input checked="" type="checkbox"/>	NP, Non-Plastic <input type="checkbox"/>
Liquid limit Test:	Multipoint Method <input checked="" type="checkbox"/>	One-point Method <input type="checkbox"/>		Liquid Limit <u>28</u>
Classification:	ASTM D 2487 <input type="checkbox"/>	AASHTO M 145 <input checked="" type="checkbox"/>		Plastic Limit <u>22</u>
Liquid limit Test:	ASTM D 4318 <input type="checkbox"/>	AASHTO T 89 <input checked="" type="checkbox"/>		Plastic Index <u>6</u>
Plastic limit Test:	ASTM D 4318 <input type="checkbox"/>	AASHTO T 90 <input checked="" type="checkbox"/>		Group Symbol <u>A-2-4</u>

Technician Name: Brian Urban

Certification #

Technical Responsibility: Trapp Harris

Signature

Staff Professional

Position





## Particle Size Analysis of Soils

Laboratory Record Version 4.0

Report Date:

4/29/05

Project #: 1611-04-386

Test Date(s):

4/13/05-4/28/05

Project Name:

RBO South Fork Edisto River & Cedar Creek

Client Name:

SCDOT

Client Address:

P.O. Box 191, Columbia, South Carolina, 29202-0191

Boring #: 8

Sample #: 1

Sample Date: Various

Liquid Limit:

Plastic Limit:

Plastic Index:

Location: B-8

Elevation: 14.6'-16.1'

Sample Description: Clayey Sand (SC, A-2-4) low plasticity, fine sand, gray

Pan #:	30	Beaker #:	30	Specific Gravity:	2.466	Moisture Content	Hygroscopic	Natural	Sieve	Retained Wt.	Percent Passing
Hydrometer Jar #:			8373			Tare #	105		3.0"	0.0	100.0%
Pan Tare Weight (grams):			0.00			Tare Wt.	13.64		1.5"	0.0	100.0%
Total Sample Wet Wt. + tare wt. (grams):			115.42			Wet Wt. + A	35.67		1.0"	0.0	100.0%
Weight of Total Sample Air Dried:			115.42			Dry Wt. + A	35.53		3/4"	0.0	100.0%
Weight of Air Dried Hydrometer Sample (g):			115.42			Water Wt. (B-C)	0.14		1/2"	0.0	100.0%
Total Sample Oven Dried:			114.69			Dry Wt. (C-A)	21.89		3/8"	0.0	100.0%
Hydrometer Sample Oven Dried (W):			114.69			% Moisture (100 x D/E)	0.64%		#4	0.0	100.0%
% Passing #10:			100.0%						#10	0.0	100.0%
Correction Factor a (Table 1):			1.05						#40	4.6	96.0%
									#200	80.1	30.2%

Notes:	Description of Sand & Gravel Particles:	Rounded <input checked="" type="checkbox"/>	Angular <input checked="" type="checkbox"/>	Hard & Durable <input checked="" type="checkbox"/>	Soft <input type="checkbox"/>	Weathered & Friable <input type="checkbox"/>
Maximum Particle Size:		Total Sand:	69.8%	< 4.74 mm and > 0.075 mm	Type:	Mechanical Stirring Apparatus (A)
% Gravel:	0.0%	Silt & Clay:	30.2%	< 0.075	Dispersion Time:	1 min.
Coarse Sand:	0.0%	Silt:	2.2%	< 0.075 and > 0.005 mm	Sodium Hexametaphosphate:	40 g./ Liter
Medium Sand:	0.0%	Clay:	28.0%	< 0.005 mm		
Fine Sand:	69.8%	Colloids:	6.0%	< 0.001 mm	Hydrometer:	151H <input type="checkbox"/> 152H <input checked="" type="checkbox"/>

Time	Temp. (°C)	Hydrometer Reading	Corrections		Hydrometer R	Percent Passing		Table 2	Table 3		Diameter D = K x (L/T) <sup>1/2</sup>
			Control Cylinder	Composite Correction		P (#10) = (R x a / W) x 100	P (total) = P x % Passing #10		L	K	
12:40	2	27.0	4.0	3.0	23.0	21.1%	21.1%	12.5	0.01404	0.03510	
12:43	5	26.0	4.0	3.0	22.0	20.1%	20.1%	12.7	0.01404	0.02238	
12:53	15	23.0	4.0	3.2	19.0	17.4%	17.4%	13.2	0.01421	0.01333	
1:08	30	21.0	4.0	3.2	17.0	15.6%	15.6%	13.5	0.01421	0.00953	
1:38	60	18.0	4.0	3.2	14.0	12.8%	12.8%	14.0	0.01421	0.00686	
4:48	250	15.0	4.0	3.5	11.0	10.1%	10.1%	14.5	0.01438	0.00346	
12:38	1440	12.0	4.0	3.3	8.0	7.3%	7.3%	15.0	0.01421	0.00145	
12:38	2880	10.0	4.0	3.3	6.0	5.5%	5.5%	15.3	0.01421	0.00104	

References:		ASTM D 422: Particle Size Analysis of Soils	
Brian Urban		ASTM D 421: Dry Preparation of Soil Samples	
		ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass	
		ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils	
		ASTM D 2487: Classification of Soils for Engineering Purposes (Unified Soil Classification System)	

Technical Responsibility:	Trapp Harris	Position:	Staff Professional
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S&ME, INC.

134 Suber Road, Columbia, S.C. 29210

# Particle Size Analysis of Soils

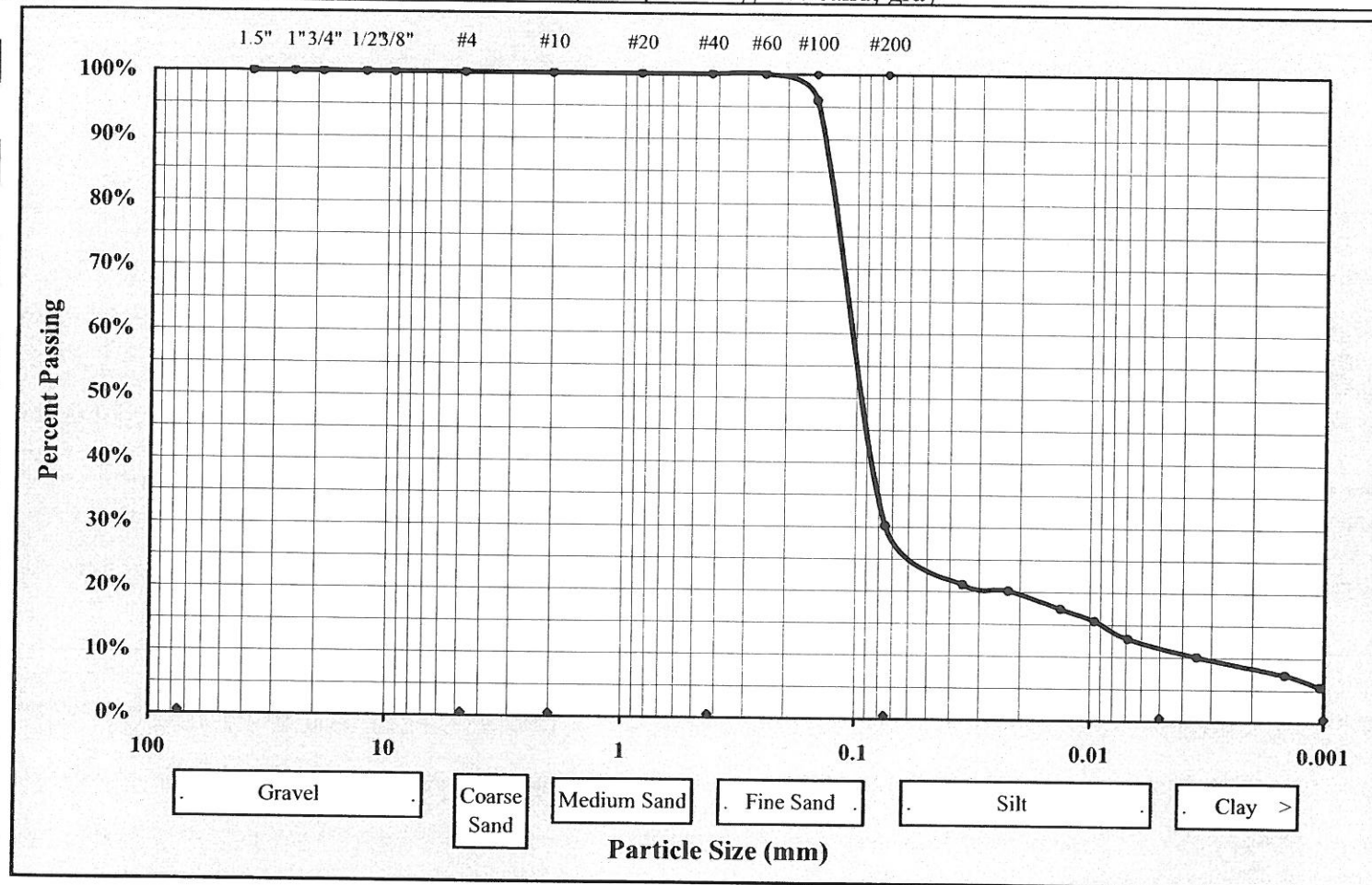
ASTM D 422



S&ME Project #: **1611-04-386**  
 Project Name: **RBO South Fork Edisto River & Cedar Creek**  
 Client Name: **SCDOT**  
 Client Address: **P.O. Box 191, Columbia, South Carolina, 29202-0191**

Report Date: **4/29/05**  
 Test Date(s): **4/13/05-4/28/05**

Boring #: **8** Sample #: **1** Sample Date: **Various**  
 Location: **B-8** Elevation: **14.6'-16.1'**  
 Sample Description: **Clayey Sand (SC, A-2-4) low plasticity, fine sand, gray**



Moisture Content		Gravel	0.0%	Liquid Limit	
Silt & Clay (% Passing #200)	30.2%	Sand	69.8%	Plastic Limit	
Maximum Particle Size	0	Silt	2.2%	Plastic Index	
Specific Gravity	2.466	Clay	28.0%	Colloids	6.0%

Description of Sand & Gravel Particles: Rounded ☒ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐  
 ASTM D 422: Particle Size Analysis of Soils  
 Dispersing Agent: Sodium Hexametaphosphate: 40 g./ Liter  
 Mechanical Stirring Apparatus (A) Length of Dispersion Period: 1 min.

References: ASTM D 854: Specific Gravity of Soils  
 ASTM D 421: Dry Preparation of Soil Samples  
 ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass  
 ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils  
 ASTM D 2487: Classification of Soils for Engineering Purposes (Unified Soil Classification System)

Technical Responsibility / Position: **Trapp Harris**

**Staff Professional**



# **SPECIFIC GRAVITY OF SOILS** Test Method A

**ASTM D-854**

PROJECT NO 1611-05-386 BORING NO B-8  
PROJECT NAME RBO South Fork Edisto & Cedar Creek SAMPLE NO 1  
DATE 4/21/2005 DEPTH 14.6'-16.1'  
DESCRIPTION Clayey Sand (SC, A-2-4) low plasticity, fine sand, gray  
TESTED BY BU COMPUTED BY BU CHECKED BY BU

VOL FLASK NO <u>5</u>	VOL FLASK NO <u>          </u>	VOL FLASK NO <u>          </u>
1. WT. OF SOIL & VOL FLASK <u>84.95</u> g	1. WT. OF SOIL & VOL FLASK <u>          </u> g	1. WT. OF SOIL & VOL FLASK <u>          </u> g
2. Wt. of flask <u>64.63</u> g	2. Wt. of flask <u>          </u> g	2. Wt. of flask <u>          </u> g
A. WT. OF SOIL <u>20.32</u> g	A. WT. OF SOIL <u>0</u> g	A. WT. OF SOIL <u>          </u> g
B. WT. OF VOL. (from vol. Flask chart) FLASK & WATER <u>164.254</u> g	B. WT. OF VOL. (from vol. Flask chart) FLASK & WATER <u>          </u> g	B. WT. OF VOL. (from vol. Flask chart) FLASK & WATER <u>          </u> g
WATER TEM <u>28</u> °C	WATER TEMP. <u>          </u> °C	WATER TEMP. <u>          </u> °C
C. WT. OF VOL. FLASK, SOIL & WATER <u>176.35</u> g	C. WT. OF VOL. FLASK, SOIL & WATER <u>          </u> g	C. WT. OF VOL. FLASK, SOIL & WATER <u>          </u> g
D. SPECIFIC GRAVITY = $\frac{A}{A+(B-C)} = \frac{2.471}{g}$	D. SPECIFIC GRAVITY = $\frac{A}{A+(B-C)} = \frac{          }{g}$	D. SPECIFIC GRAVITY = $\frac{A}{A+(B-C)} = \frac{          }{g}$

SPECIFIC GRAVITY (CORRECTED)  $G_s = D \cdot K =$

H <sub>2</sub> O TEMP. °C	CORRECTION FACTOR, K
18	1.0004
19	1.0002
20	1.0000
21	0.9998
22	0.9996
23	0.9993
24	0.9991
25	0.9989
26	0.9986
27	0.9983
28	0.9980
29	0.9977
30	0.9974

FLASK NO. 5  
 $G_s = D \cdot K = \frac{2.466}{g}$

FLASK NO. 0  
 $G_s = D \cdot K = \frac{          }{g}$

FLASK NO. 0  
 $G_s = D \cdot K = \frac{          }{g}$

AVERAGE  
 $G_s = \frac{2.466}{g}$

## Particle Size Analysis of Soils

ASTM D 422



Project #: 1611-04-386

Project Name: RBO South Fork Edisto River &amp; Cedar Creek

Client Name: SCDOT

Client Address: PO Box 191, Columbia, South Carolina, 29202-0191

Test Date(s): 4/13/05-4/28/05

Report Date: 5/1/05

Boring #: 8

Sample #: 1

Sample Date: Various

Location: B-8

Elevation: 14.6'-16.1'

Sample Description: Clayey Sand (SC, A-2-4) low plasticity, fine sand, gray

Particle Size Analysis / Without Hydrometer Analysis			Moisture Content		Natural
	Tare Number	30.0	A	Tare #	30
A	Tare Weight	0.0	B	Tare Weight	0.00
B	Total Sample Dry Wt. + Tare Wt.	0.0	C	Wet Weight + Tare Wt.	25.14
C	Total Sample Dry Weight (B-A)	115.42	D	Dry Weight + Tare Wt.	16.04
D	Total Sample Wt. After #200 Wash	80.10	E	Water Wt. (B-C)	9.10
E	Percent Passing #200 (1-D/C)x100	30.6%		Dry Wt.(C-A)	16.04
			Moisture Content (100 x D/E) (%)		56.7%
Sieve Size (mm)	Sieve Size	Retained Weight	Percent Retained		Percent Passing Total Sample
37.50	1.5"	0.0	0.0%		100.0%
25.00	1.0"	0.00	0.0%		100.0%
19.00	3/4"	0.00	0.0%		100.0%
12.50	1/2"	0.00	0.0%		100.0%
9.50	3/8"	0.00	0.0%		100.0%
4.75	#4	0.00	0.0%		100.0%
2.36	#8	0.00	0.0%		100.0%
1.18	#16	0.10	0.1%		99.9%
0.60	#30	0.70	0.6%		99.3%
0.30	#50	6.20	5.4%		93.9%
0.15	#100	39.50	34.2%		59.7%
0.075	#200	33.60	29.1%		30.6%

Notes: Maximum Particle Size		Gravel	< 75 mm and > 4.75 mm (#4)	0.0%
Apparent Relative Density		Coarse Sand	< 4.75 mm and > 2.00 mm (#10)	0.0%
Liquid Limit	Fineness Modulus	Medium Sand	< 2.00 mm and > 0.425 mm (#40)	0.7%
Plastic Limit	Cu = D60/D10:	Fine Sand	< 0.425 mm and > 0.075 mm (#200)	68.7%
Plastic Index	Cc = (D30) <sup>2</sup> / (D10 x D60):	% Silt and Clay	< 0.075 mm	30.6%
		Description of Sand & Gravel	Rounded <input checked="" type="checkbox"/> Angular <input checked="" type="checkbox"/>	
		Hard & Durable <input checked="" type="checkbox"/> Soft <input type="checkbox"/> Weathered & Friable <input type="checkbox"/>		

Organic Content

D10 =

D30 =

D60 =

D50 =

D90 =

ASTM D 422: Particle Size Analysis of Soils

Hydrometer portion of test method not utilized.

ASTM D 421: Dry Preparation of Soil Samples

ASTM D 854: Specific Gravity of Soils

ASTM D 4318: Liquid Limit, Plastic Limit, &amp; Plastic Index of Soils

ASTM D 2487: Classification of Soils for Engineering Purposes (Unified Soil Classification System)

Technician Name:

Brian Urban

Certification #

Technical Responsibility:

Trapp Harris

Signature

Staff Professional

Position



## Particle Size Analysis of Soils

ASTM D 422



Project #: 1611-04-386

Project Name: RBO South Fork Edisto River &amp; Cedar Creek

Client Name: SCDOT

Client Address: PO Box 191, Columbia, SC 29202-0191

Test Date(s): 4/13/05-4/28/05

Report Date: 5/1/05

Boring #: 8

Sample #: 4

Sample Date: Various

Location: B-8

Elevation: 29.3'-30.8

Sample Description: Silty Sand (SM, A-2-4) low plasticity, fine to medium sand, purple

Particle Size Analysis / Without Hydrometer Analysis			Moisture Content		Natural
				Tare #	217
	Tare Number	217.0	A	Tare Weight	0.00
A	Tare Weight	0.0	B	Wet Weight + Tare Wt.	178.16
B	Total Sample Dry Wt. + Tare Wt.	0.0	C	Dry Weight + Tare Wt.	152.12
C	Total Sample Dry Weight (B-A)	152.12	D	Water Wt. (B-C)	26.04
D	Total Sample Wt. After #200 Wash	109.15	E	Dry Wt.(C-A)	152.12
E	Percent Passing #200 (1-D/C)x100	28.2%	Moisture Content (100 x D/E) (%)		17.1%
Sieve Size (mm)	Sieve Size	Retained Weight	Percent Retained		Percent Passing Total Sample
37.50	1.5"	0.0	0.0%		100.0%
25.00	1.0"	0.00	0.0%		100.0%
19.00	3/4"	0.00	0.0%		100.0%
12.50	1/2"	0.00	0.0%		100.0%
9.50	3/8"	0.00	0.0%		100.0%
4.75	#4	6.28	4.1%		95.9%
2.36	#8	8.42	5.5%		90.3%
1.18	#16	26.95	17.7%		72.6%
0.60	#30	43.99	28.9%		43.7%
0.30	#50	15.61	10.3%		33.4%
0.15	#100	5.58	3.7%		29.8%
0.075	#200	2.32	1.5%		28.2%

<b>Notes:</b>		Maximum Particle Size	Gravel	< 75 mm and > 4.75 mm (#4)	4.1%
		Apparent Relative Density	Coarse Sand	< 4.75 mm and > 2.00 mm (#10)	5.5%
Liquid Limit	32	Fineness Modulus	Medium Sand	< 2.00 mm and > 0.425 mm (#40)	46.6%
Plastic Limit	26	Cu = D60/D10:	Fine Sand	< 0.425 mm and > 0.075 mm (#200)	15.5%
Plastic Index	6	Cc = (D30) <sup>2</sup> / (D10xD60):	% Silt and Clay	< 0.075 mm	28.2%
		Description of Sand & Gravel		Rounded <input checked="" type="checkbox"/>	Angular <input checked="" type="checkbox"/>
		Hard & Durable <input checked="" type="checkbox"/>		Soft <input type="checkbox"/>	Weathered & Friable <input type="checkbox"/>

Organic Content

D10 =

D30 =

D60 =

D50 =

D90 =

ASTM D 422: Particle Size Analysis of Soils

ASTM D 421: Dry Preparation of Soil Samples

ASTM D 4318: Liquid Limit, Plastic Limit, &amp; Plastic Index of Soils

ASTM D 2487: Classification of Soils for Engineering Purposes (Unified Soil Classification System)

Hydrometer portion of test method not utilized.

ASTM D 854: Specific Gravity of Soils

Technician Name:

Brian Urban

Certification #

Technical Responsibility:

Trapp Harris

Signature

Staff Professional

Position





## Liquid Limit, Plastic Limit, and Plastic Index

Project #: **1611-04-386**  
 Project Name: **RBO South Fork Edisto River & Cedar Creek**  
 Client Name: **SCDOT**  
 Client Address: **P.O. Box 191, Columbia, South Carolina, 29202-0191**

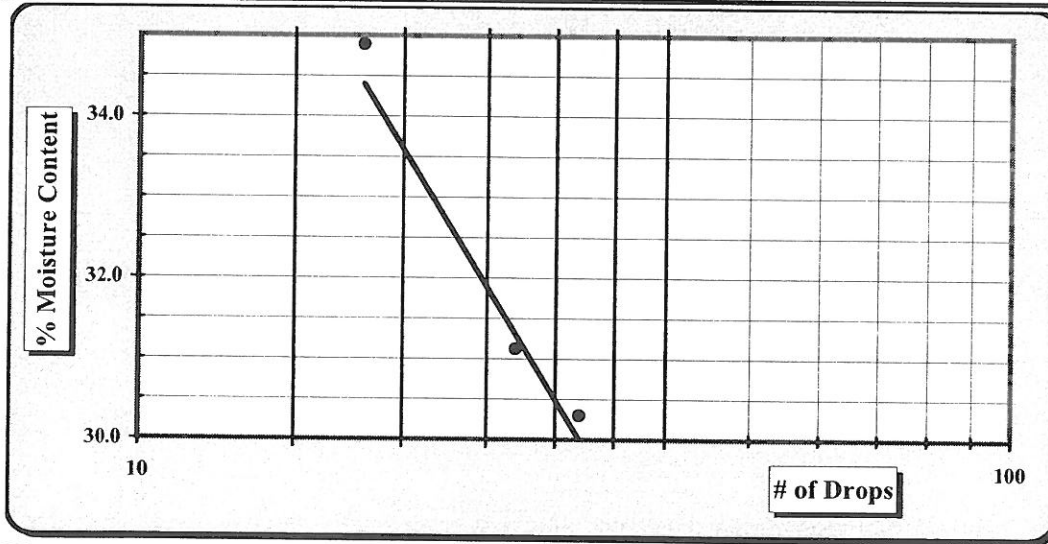
Report Date: **4/27/05**  
 Test Date(s): **4/16/05-4/28/05**

Boring #: **8** Sample #: **4** Sample Date: **Various**

Location: **B-8** Elevation: **29.3'-30.8'**

Sample Description: **Silty Sand (SM, A-2-4) low plasticity, fine to medium sand, purple**

Pan #		Liquid Limit						Plastic Limit		
	Test #	1	2	3	4	5	6	1	2	3
	Tare #	110	101	146				133	121	
A	Tare Weight	13.76	13.91	13.52				13.78	13.50	
B	Wet Soil Weight + A	23.58	23.39	21.82				17.63	17.52	
C	Dry Soil Weight + A	21.04	21.14	19.89				16.85	16.70	
D	Water Weight (B-C)	2.54	2.25	1.93				0.78	0.82	
E	Dry Soil Weight (C-A)	7.28	7.23	6.37				3.07	3.20	
F	% Moisture Content (D/E)*100	34.9%	31.1%	30.3%				25.4%	25.6%	
N	# OF DROPS	18	27	32				Moisture Contents determined by ASTM D 2216		
LL	LL = F * FACTOR									
Ave.	Average							25.5%		



One Point Liquid Limit

N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.990	29	1.018
24	0.995	30	1.022
25	1.000		

Notes:

Special Sampling Methods:

Sample Preparation:	Wet Preparation <input type="checkbox"/>	Dry Preparation <input checked="" type="checkbox"/>	Air Dried <input checked="" type="checkbox"/>	NP, Non-Plastic <input type="checkbox"/>
Liquid limit Test:	Multipoint Method <input checked="" type="checkbox"/>	One-point Method <input type="checkbox"/>		Liquid Limit <u>32</u>
Classification:	ASTM D 2487 <input type="checkbox"/>	AASHTO M 145 <input checked="" type="checkbox"/>		Plastic Limit <u>26</u>
Liquid limit Test:	ASTM D 4318 <input type="checkbox"/>	AASHTO T 89 <input checked="" type="checkbox"/>		Plastic Index <u>6</u>
Plastic limit Test:	ASTM D 4318 <input type="checkbox"/>	AASHTO T 90 <input checked="" type="checkbox"/>		Group Symbol <u>A-2-4</u>

Technician Name: Brian Urban

Certification #

Technical Responsibility: Trapp Harris

Signature

Staff Professional

Position

## Particle Size Analysis of Soils

ASTM D 422



Project #: 1611-04-386

Project Name: RBO South Fork Edisto River &amp; Cedar Creek

Client Name: SCDOT

Client Address: PO Box 191, Columbia, SC 29202-0191

Test Date(s): 4/13/05-4/28/05

Report Date: 5/1/05

Boring #: 8

Sample #: 10

Sample Date: Various

Location: B-8

Elevation: 59.3'-60.8'

Sample Description: Elastic Silt (MH, A-7-5) medium plasticity, fine to medium sand, white, purple and orange

Particle Size Analysis / Without Hydrometer Analysis			Moisture Content		Natural
	Tare Number	401.0	A	Tare Weight	0.00
A	Tare Weight	0.0	B	Wet Weight + Tare Wt.	98.32
B	Total Sample Dry Wt. + Tare Wt.	0.0	C	Dry Weight + Tare Wt.	74.33
C	Total Sample Dry Weight (B-A)	74.33	D	Water Wt. (B-C)	23.99
D	Total Sample Wt. After #200 Wash	8.63	E	Dry Wt.(C-A)	74.33
E	Percent Passing #200 (1-D/C)x100	88.4%	Moisture Content (100 x D/E) (%)		32.3%
Sieve Size (mm)	Sieve Size	Retained Weight	Percent Retained		Percent Passing Total Sample
37.50	1.5"	0.0	0.0%		100.0%
25.00	1.0"	0.00	0.0%		100.0%
19.00	3/4"	0.00	0.0%		100.0%
12.50	1/2"	0.00	0.0%		100.0%
9.50	3/8"	0.00	0.0%		100.0%
4.75	#4	0.53	0.7%		99.3%
2.36	#8	1.29	1.7%		97.6%
1.18	#16	0.61	0.8%		96.7%
0.60	#30	1.89	2.5%		94.2%
0.30	#50	1.02	1.4%		92.8%
0.15	#100	1.00	1.3%		91.5%
0.075	#200	2.29	3.1%		88.4%

<b>Notes:</b>		Maximum Particle Size	Gravel	< 75 mm and > 4.75 mm (#4)	0.7%
		Apparent Relative Density	Coarse Sand	< 4.75 mm and > 2.00 mm (#10)	1.7%
Liquid Limit	60	Fineness Modulus	Medium Sand	< 2.00 mm and > 0.425 mm (#40)	3.4%
Plastic Limit	32	Cu = D60/D10:	Fine Sand	< 0.425 mm and > 0.075 mm (#200)	5.8%
Plastic Index	28	Cc = (D30) <sup>2</sup> / (D10xD60):	% Silt and Clay	< 0.075 mm	88.4%
			Description of Sand & Gravel	Rounded <input checked="" type="checkbox"/> Angular <input checked="" type="checkbox"/>	
			Hard & Durable <input checked="" type="checkbox"/> Soft <input type="checkbox"/> Weathered & Friable <input type="checkbox"/>		

Organic Content

D10 =

D30 =

D60 =

D50 =

D90 =

ASTM D 422: Particle Size Analysis of Soils

Hydrometer portion of test method not utilized.

ASTM D 421: Dry Preparation of Soil Samples

ASTM D 854: Specific Gravity of Soils

ASTM D 4318: Liquid Limit, Plastic Limit, &amp; Plastic Index of Soils

ASTM D 2487: Classification of Soils for Engineering Purposes (Unified Soil Classification System)

Technician Name:

Brian Urban

Certification #

Technical Responsibility:

Trapp Harris

Signature

Staff Professional

Position



## Liquid Limit, Plastic Limit, and Plastic Index

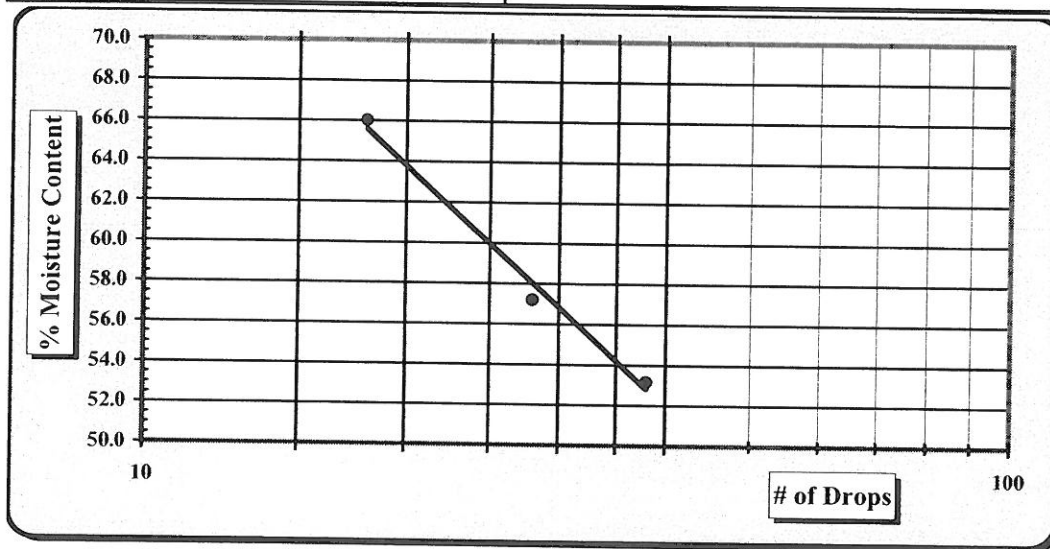
Project #: **1611-04-386**  
 Project Name: RBO South Fork Edisto River & Cedar Creek  
 Client Name: SCDOT  
 Client Address: P.O. Box 191, Columbia, South Carolina, 29202-0191  
 Boring #: 8 Sample #: 10 Sample Date: Various

Report Date: 4/26/05  
 Test Date(s): 4/16/05-4/28/05

Location: B-8 Elevation: 59.3'-60.8'

Sample Description: Elastic Silt (MH, A-7-5) medium plasticity, fine to medium sand, white, purple and

Pan #	Test #	Liquid Limit						Plastic Limit		
		1	2	3	4	5	6	1	2	3
	Tare #	3	15	1				18	37	
A	Tare Weight	14.58	14.33	16.98				16.90	16.89	
B	Wet Soil Weight + A	23.96	24.06	27.41				22.30	22.84	
C	Dry Soil Weight + A	20.23	20.52	23.79				21.01	21.41	
D	Water Weight (B-C)	3.73	3.54	3.62				1.29	1.43	
E	Dry Soil Weight (C-A)	5.65	6.19	6.81				4.11	4.52	
F	% Moisture Content (D/E)*100	66.0%	57.2%	53.2%				31.4%	31.6%	
N	# OF DROPS	18	28	38				Moisture Contents determined by ASTM D 2216		
LL	LL = F * FACTOR									
Ave.	Average							31.5%		



One Point Liquid Limit

N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.990	29	1.018
24	0.995	30	1.022
25	1.000		

Notes:

Special Sampling Methods:

Sample Preparation:	Wet Preparation <input type="checkbox"/>	Dry Preparation <input checked="" type="checkbox"/>	Air Dried <input checked="" type="checkbox"/>	NP, Non-Plastic <input type="checkbox"/>
Liquid limit Test:	Multipoint Method <input checked="" type="checkbox"/>	One-point Method <input type="checkbox"/>		Liquid Limit 60
Classification:	ASTM D 2487 <input type="checkbox"/>	AASHTO M 145 <input checked="" type="checkbox"/>		Plastic Limit 32
Liquid limit Test:	ASTM D 4318 <input type="checkbox"/>	AASHTO T 89 <input checked="" type="checkbox"/>		Plastic Index 28
Plastic limit Test:	ASTM D 4318 <input type="checkbox"/>	AASHTO T 90 <input checked="" type="checkbox"/>		Group Symbol A-7-5

Technician Name: Brian Urban

Certification #

Technical Responsibility: Trapp Harris

Signature

Staff Professional

Position

## Particle Size Analysis of Soils

ASTM D 422



Project #: 1611-04-386

Project Name: RBO South Fork Edisto River &amp; Cedar Creek

Client Name: SCDOT

Client Address: PO Box 191, Columbia, SC 29202-0191

Test Date(s): 4/13/05-4/28/05

Report Date: 5/1/05

Boring #: 8

Sample #: 14

Sample Date: Various

Location: B-8

Elevation: 79.3'-80.8'

Sample Description: Silty Sand (SM, A-7-6) medium plasticity, fine to medium sand, white and purple

Particle Size Analysis / Without Hydrometer Analysis			Moisture Content		Natural
				Tare #	220
	Tare Number	220.0	A	Tare Weight	0.00
A	Tare Weight	0.0	B	Wet Weight + Tare Wt.	146.81
B	Total Sample Dry Wt. + Tare Wt.	0.0	C	Dry Weight + Tare Wt.	121.22
C	Total Sample Dry Weight (B-A)	121.22	D	Water Wt. (B-C)	25.59
D	Total Sample Wt. After #200 Wash	84.60	E	Dry Wt.(C-A)	121.22
E	Percent Passing #200 (1-D/C)x100	30.2%	Moisture Content (100 x D/E) (%)		21.1%
Sieve Size (mm)	Sieve Size	Retained Weight	Percent Retained		Percent Passing Total Sample
37.50	1.5"	0.0	0.0%		100.0%
25.00	1.0"	0.00	0.0%		100.0%
19.00	3/4"	0.00	0.0%		100.0%
12.50	1/2"	0.00	0.0%		100.0%
9.50	3/8"	0.00	0.0%		100.0%
4.75	#4	0.00	0.0%		100.0%
2.36	#8	0.08	0.1%		99.9%
1.18	#16	3.14	2.6%		97.3%
0.60	#30	23.41	19.3%		78.0%
0.30	#50	35.09	28.9%		49.1%
0.15	#100	13.51	11.1%		37.9%
0.075	#200	9.37	7.7%		30.2%

<b>Notes:</b>		Maximum Particle Size	Gravel	< 75 mm and > 4.75 mm (#4)	0.0%
		Apparent Relative Density	Coarse Sand	< 4.75 mm and > 2.00 mm (#10)	0.1%
Liquid Limit	41	Fineness Modulus	Medium Sand	< 2.00 mm and > 0.425 mm (#40)	21.9%
Plastic Limit	26	Cu = D60/D10:	Fine Sand	< 0.425 mm and > 0.075 mm (#200)	47.8%
Plastic Index	15	Cc = (D30) <sup>2</sup> / (D10xD60):	% Silt and Clay	< 0.075 mm	30.2%
			Description of Sand & Gravel	Rounded <input checked="" type="checkbox"/> Angular <input checked="" type="checkbox"/>	
			Hard & Durable <input checked="" type="checkbox"/> Soft <input type="checkbox"/>	Weathered & Friable <input type="checkbox"/>	

Organic Content

D10 =

D30 =

D60 =

D50 =

D90 =

ASTM D 422: Particle Size Analysis of Soils

ASTM D 421: Dry Preparation of Soil Samples

ASTM D 4318: Liquid Limit, Plastic Limit, &amp; Plastic Index of Soils

ASTM D 2487: Classification of Soils for Engineering Purposes (Unified Soil Classification System)

Hydrometer portion of test method not utilized.

ASTM D 854: Specific Gravity of Soils

Technician Name:

Brian Urban

Certification #

Technical Responsibility:

Trapp Harris

Signature

Staff Professional

Position





## Liquid Limit, Plastic Limit, and Plastic Index

Project #: **1611-04-386**  
 Project Name: **RBO South Fork Edisto River & Cedar Creek**  
 Client Name: **SCDOT**  
 Client Address: **P.O. Box 191, Columbia, South Carolina, 29202-0191**

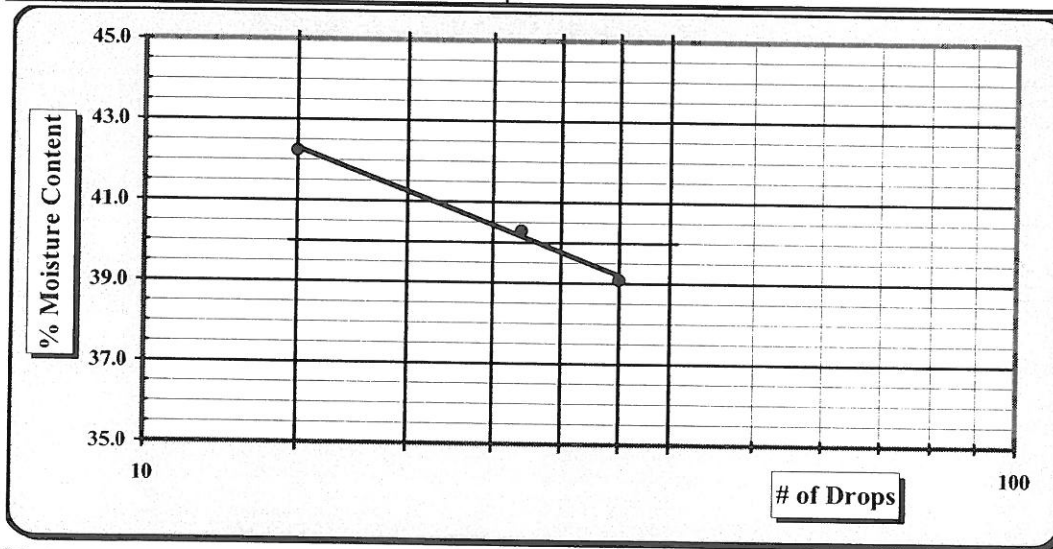
Report Date: **4/26/05**  
 Test Date(s): **4/16/05-4/28/05**

Boring #: **8** Sample #: **14** Sample Date: **Various**

Location: **B-8** Elevation: **79.1'-80.8'**

Sample Description: **Silty Sand (SM, A-7-6) medium plasticity, fine to medium sand, white and purple**

Pan #		Liquid Limit						Plastic Limit		
	Test #	1	2	3	4	5	6	1	2	3
	Tare #	139	115	107				121	106	
A	Tare Weight	13.72	13.81	13.60				13.48	13.58	
B	Wet Soil Weight + A	24.70	24.78	24.17				19.97	19.94	
C	Dry Soil Weight + A	21.44	21.63	21.20				18.66	18.60	
D	Water Weight (B-C)	3.26	3.15	2.97				1.31	1.34	
E	Dry Soil Weight (C-A)	7.72	7.82	7.60				5.18	5.02	
F	% Moisture Content (D/E)*100	42.2%	40.3%	39.1%				25.3%	26.7%	
N	# OF DROPS	15	27	35				Moisture Contents determined by ASTM D 2216		
LL	LL = F * FACTOR									
Ave.	Average							26.0%		



One Point Liquid Limit			
N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.990	29	1.018
24	0.995	30	1.022
25	1.000		

Notes:

### Special Sampling Methods:

Sample Preparation:	Wet Preparation <input type="checkbox"/>	Dry Preparation <input checked="" type="checkbox"/>	Air Dried <input checked="" type="checkbox"/>	NP, Non-Plastic <input type="checkbox"/>
Liquid limit Test:	Multipoint Method <input checked="" type="checkbox"/>	One-point Method <input type="checkbox"/>		Liquid Limit <u>41</u>
Classification:	ASTM D 2487 <input type="checkbox"/>	AASHTO M 145 <input checked="" type="checkbox"/>		Plastic Limit <u>26</u>
Liquid limit Test:	ASTM D 4318 <input type="checkbox"/>	AASHTO T 89 <input checked="" type="checkbox"/>		Plastic Index <u>15</u>
Plastic limit Test:	ASTM D 4318 <input type="checkbox"/>	AASHTO T 90 <input checked="" type="checkbox"/>		Group Symbol <u>A-7-6</u>

Technician Name: Brian Urban

Certification #

Technical Responsibility: Trapp Harris

Signature

Staff Professional

Position



## Particle Size Analysis of Soils

ASTM D 422



Project #: 1611-04-386

Project Name: RBO South Fork Edisto River &amp; Cedar Creek

Client Name: SCDOT

Client Address: PO Box 191, Columbia, SC 29202-0191

Test Date(s): 4/13/05-4/28/05

Report Date: 5/1/05

Boring #: 9

Sample #: 7

Sample Date: Various

Location: B-9

Elevation: 43.8'-45.3'

Sample Description: Fat Clay w/ Sand (CH, A-7-6) high plasticity, fine to medium sand, white, purple, red and orange

Particle Size Analysis / Without Hydrometer Analysis			Moisture Content		Natural
	Tare Number	215.0	A	Tare Weight	0.00
A	Tare Weight	0.0	B	Wet Weight + Tare Wt.	147.83
B	Total Sample Dry Wt. + Tare Wt.	0.0	C	Dry Weight + Tare Wt.	119.17
C	Total Sample Dry Weight (B-A)	119.17	D	Water Wt. (B-C)	28.66
D	Total Sample Wt. After #200 Wash	19.29	E	Dry Wt.(C-A)	119.17
E	Percent Passing #200 (1-D/C)x100	83.8%	Moisture Content (100 x D/E) (%)		24.0%
Sieve Size (mm)	Sieve Size	Retained Weight	Percent Retained		Percent Passing Total Sample
37.50	1.5"	0.0	0.0%		100.0%
25.00	1.0"	0.00	0.0%		100.0%
19.00	3/4"	0.00	0.0%		100.0%
12.50	1/2"	0.00	0.0%		100.0%
9.50	3/8"	0.00	0.0%		100.0%
4.75	#4	0.00	0.0%		100.0%
2.36	#8	0.00	0.0%		100.0%
1.18	#16	0.54	0.5%		99.5%
0.60	#30	1.77	1.5%		98.1%
0.30	#50	4.19	3.5%		94.5%
0.15	#100	6.05	5.1%		89.5%
0.075	#200	6.74	5.7%		83.8%

<b>Notes:</b>		Maximum Particle Size	Gravel	< 75 mm and > 4.75 mm (#4)	0.0%
		Apparent Relative Density	Coarse Sand	< 4.75 mm and > 2.00 mm (#10)	0.0%
Liquid Limit	70	Fineness Modulus	Medium Sand	< 2.00 mm and > 0.425 mm (#40)	1.9%
Plastic Limit	28	Cu = D60/D10:	Fine Sand	< 0.425 mm and > 0.075 mm (#200)	14.2%
Plastic Index	42	Cc = (D30) <sup>2</sup> / (D10xD60):	% Silt and Clay	< 0.075 mm	83.8%
			Description of Sand & Gravel	Rounded <input checked="" type="checkbox"/> Angular <input checked="" type="checkbox"/>	
			Hard & Durable <input checked="" type="checkbox"/> Soft <input type="checkbox"/> Weathered & Friable <input type="checkbox"/>		

Organic Content

D10 =

D30 =

D60 =

D50 =

D90 =

ASTM D 422: Particle Size Analysis of Soils

Hydrometer portion of test method not utilized.

ASTM D 421: Dry Preparation of Soil Samples

ASTM D 854: Specific Gravity of Soils

ASTM D 4318: Liquid Limit, Plastic Limit, &amp; Plastic Index of Soils

ASTM D 2487: Classification of Soils for Engineering Purposes (Unified Soil Classification System)

Technician Name:

Brian Urban

Certification #

Technical Responsibility:

Trapp Harris

Signature

Staff Professional

Position



## Liquid Limit, Plastic Limit, and Plastic Index

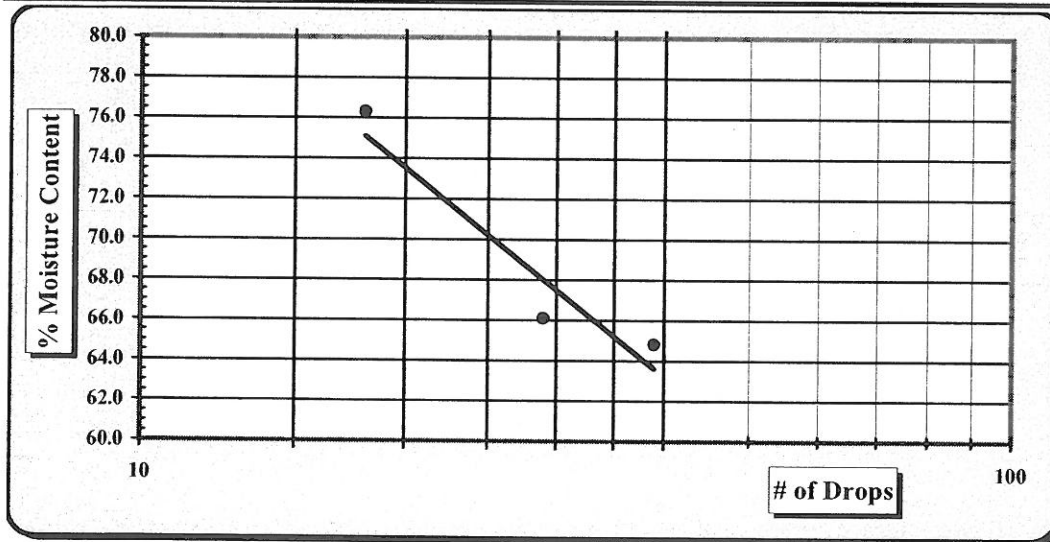
Project #: **1611-04-386**  
 Project Name: **RBO South Fork Edisto River & Cedar Creek**  
 Client Name: **SCDOT**  
 Client Address: **P.O. Box 191, Columbia, South Carolina, 29202-0191**  
 Boring #: **9** Sample #: **7** Sample Date: **Various**

Report Date: **4/26/05**  
 Test Date(s): **4/16/05-4/28/05**

Location: **B-9** Elevation: **43.8'-45.3'**

Sample Description: **Fat Clay w/ Sand (CH, A-7-6) high plasticity, fine to medium sand, white, purple, red**

Pan #		Liquid Limit						Plastic Limit		
	Test #	1	2	3	4	5	6	1	2	3
	Tare #	113	143	109				114	120	
A	Tare Weight	13.58	13.52	13.74				13.82	13.63	
B	Wet Soil Weight + A	24.74	25.03	25.21				18.85	18.70	
C	Dry Soil Weight + A	19.91	20.45	20.70				17.75	17.57	
D	Water Weight (B-C)	4.83	4.58	4.51				1.10	1.13	
E	Dry Soil Weight (C-A)	6.33	6.93	6.96				3.93	3.94	
F	% Moisture Content (D/E)*100	76.3%	66.1%	64.8%				28.0%	28.7%	
N	# OF DROPS	18	29	39				Moisture Contents determined by ASTM D 2216		
LL	LL = F * FACTOR									
Ave.	Average							28.3%		



One Point Liquid Limit			
N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.990	29	1.018
24	0.995	30	1.022
25	1.000		

Notes:

### Special Sampling Methods:

Sample Preparation:	Wet Preparation <input type="checkbox"/>	Dry Preparation <input checked="" type="checkbox"/>	Air Dried <input checked="" type="checkbox"/>	NP, Non-Plastic <input type="checkbox"/>
Liquid limit Test:	Multipoint Method <input checked="" type="checkbox"/>	One-point Method <input type="checkbox"/>		Liquid Limit <u>70</u>
Classification:	ASTM D 2487 <input type="checkbox"/>	AASHTO M 145 <input checked="" type="checkbox"/>		Plastic Limit <u>28</u>
Liquid limit Test:	ASTM D 4318 <input type="checkbox"/>	AASHTO T 89 <input checked="" type="checkbox"/>		Plastic Index <u>42</u>
Plastic limit Test:	ASTM D 4318 <input type="checkbox"/>	AASHTO T 90 <input checked="" type="checkbox"/>		Group Symbol <u>A-7-6</u>

Technician Name: Brian Urban

Certification #

Technical Responsibility: Trapp Harris

Signature

Staff Professional

Position

## Particle Size Analysis of Soils

ASTM D 422



Project #: 1611-04-386

Project Name: RBO South Fork Edisto River &amp; Cedar Creek

Client Name: SCDOT

Client Address: PO Box 191, Columbia, SC 29202-0191

Test Date(s): 4/13/05-4/28/05

Report Date: 5/1/05

Boring #: 9

Sample #: 11

Sample Date: Various

Location: B-9

Elevation: 63.8'-65.3'

Sample Description: Silty Sand (SM, A-2-4) low plasticity, fine to medium sand, white

Particle Size Analysis / Without Hydrometer Analysis			Moisture Content		Natural
				Tare #	304
	Tare Number	304.0	A	Tare Weight	0.00
A	Tare Weight	0.0	B	Wet Weight + Tare Wt.	219.54
B	Total Sample Dry Wt. + Tare Wt.	0.0	C	Dry Weight + Tare Wt.	177.84
C	Total Sample Dry Weight (B-A)	177.84	D	Water Wt. (B-C)	41.70
D	Total Sample Wt. After #200 Wash	149.84	E	Dry Wt.(C-A)	177.84
E	Percent Passing #200 (1-D/C)x100	15.7%	Moisture Content (100 x D/E) (%)		23.4%
Sieve Size (mm)	Sieve Size	Retained Weight	Percent Retained		Percent Passing Total Sample
37.50	1.5"	0.0	0.0%		100.0%
25.00	1.0"	0.00	0.0%		100.0%
19.00	3/4"	0.00	0.0%		100.0%
12.50	1/2"	0.00	0.0%		100.0%
9.50	3/8"	0.00	0.0%		100.0%
4.75	#4	0.63	0.4%		99.6%
2.36	#8	0.63	0.4%		99.3%
1.18	#16	5.03	2.8%		96.5%
0.60	#30	27.85	15.7%		80.8%
0.30	#50	76.78	43.2%		37.6%
0.15	#100	30.89	17.4%		20.3%
0.075	#200	8.03	4.5%		15.7%

<b>Notes:</b>		Maximum Particle Size	Gravel	< 75 mm and > 4.75 mm (#4)	0.4%
		Apparent Relative Density	Coarse Sand	< 4.75 mm and > 2.00 mm (#10)	0.4%
Liquid Limit	35	Fineness Modulus	Medium Sand	< 2.00 mm and > 0.425 mm (#40)	18.5%
Plastic Limit	24	Cu = D60/D10:	Fine Sand	< 0.425 mm and > 0.075 mm (#200)	65.1%
Plastic Index	11	Cc = (D30) <sup>2</sup> / (D10 x D60):	% Silt and Clay	< 0.075 mm	15.7%
			Description of Sand & Gravel	Rounded <input checked="" type="checkbox"/> Angular <input checked="" type="checkbox"/>	
			Hard & Durable <input checked="" type="checkbox"/> Soft <input type="checkbox"/> Weathered & Friable <input type="checkbox"/>		

D10 =		D30 =	D60 =	D50 =	D90 =
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ASTM D 422: Particle Size Analysis of Soils

ASTM D 421: Dry Preparation of Soil Samples

ASTM D 4318: Liquid Limit, Plastic Limit, &amp; Plastic Index of Soils

ASTM D 2487: Classification of Soils for Engineering Purposes (Unified Soil Classification System)

Hydrometer portion of test method not utilized.

ASTM D 854: Specific Gravity of Soils

Technician Name:

Brian Urban

Certification #

Technical Responsibility:

Trapp Harris

Signature

Staff Professional

Position



## Liquid Limit, Plastic Limit, and Plastic Index

Project #: **1611-04-386**  
 Project Name: **RBO South Fork Edisto River & Cedar Creek**  
 Client Name: **SCDOT**  
 Client Address: **P.O. Box 191, Columbia, South Carolina, 29202-0191**

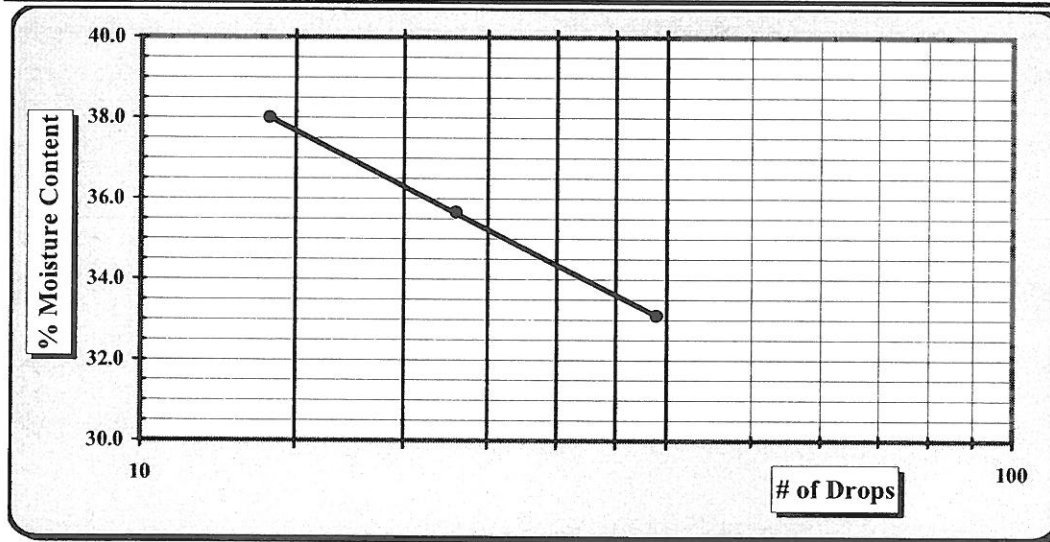
Report Date: **4/27/05**  
 Test Date(s): **4/16/05-4/28/05**

Boring #: **9** Sample #: **11** Sample Date: **Various**

Location: **B-9** Elevation: **63.8'-65.3'**

Sample Description: **Silty Sand (SM, A-2-4) low plasticity, fine to medium sand, white**

Pan #		Liquid Limit						Plastic Limit		
	Test #	1	2	3	4	5	6	1	2	3
	Tare #	140	124	142				147	113	
A	Tare Weight	13.68	13.94	13.71				13.57	13.58	
B	Wet Soil Weight + A	24.72	25.01	23.20				18.17	18.68	
C	Dry Soil Weight + A	21.68	22.10	20.84				17.26	17.70	
D	Water Weight (B-C)	3.04	2.91	2.36				0.91	0.98	
E	Dry Soil Weight (C-A)	8.00	8.16	7.13				3.69	4.12	
F	% Moisture Content (D/E)*100	38.0%	35.7%	33.1%				24.7%	23.8%	
N	# OF DROPS	14	23	39				Moisture Contents determined by ASTM D 2216		
LL	LL = F * FACTOR									
Ave.	Average							24.2%		



One Point Liquid Limit

N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.990	29	1.018
24	0.995	30	1.022
25	1.000		

Notes:

Special Sampling Methods:

Sample Preparation:	Wet Preparation <input type="checkbox"/>	Dry Preparation <input checked="" type="checkbox"/>	Air Dried <input checked="" type="checkbox"/>	NP, Non-Plastic <input type="checkbox"/>
Liquid limit Test:	Multipoint Method <input checked="" type="checkbox"/>	One-point Method <input type="checkbox"/>		Liquid Limit <u>35</u>
Classification:	ASTM D 2487 <input type="checkbox"/>	AASHTO M 145 <input checked="" type="checkbox"/>		Plastic Limit <u>24</u>
Liquid limit Test:	ASTM D 4318 <input type="checkbox"/>	AASHTO T 89 <input checked="" type="checkbox"/>		Plastic Index <u>11</u>
Plastic limit Test:	ASTM D 4318 <input type="checkbox"/>	AASHTO T 90 <input checked="" type="checkbox"/>		Group Symbol <u>A-2-4</u>

Technician Name: Brian Urban

Certification #

Technical Responsibility: Trapp Harris

Signature

Staff Professional

Position



## Particle Size Analysis of Soils

ASTM D 422



Project #: 1611-04-386

Project Name: RBO South Fork Edisto River &amp; Cedar Creek

Client Name: SCDOT

Client Address: PO Box 191, Columbia, South Carolina, 29202-0191

Test Date(s): 4/13/05-4/28/05

Report Date: 5/1/05

Boring #: 10

Sample #: 1

Sample Date: Various

Location: B-10

Elevation: 15.1'-16.6'

Sample Description: Clayey Sand (SC, A-7-6) medium plasticity, fine to medium sand, brown to gray

Particle Size Analysis / Without Hydrometer Analysis			Moisture Content		Natural
				Tare #	313
	Tare Number	313.0	A	Tare Weight	0.00
A	Tare Weight	0.0	B	Wet Weight + Tare Wt.	106.38
B	Total Sample Dry Wt. + Tare Wt.	0.0	C	Dry Weight + Tare Wt.	65.03
C	Total Sample Dry Weight (B-A)	65.03	D	Water Wt. (B-C)	41.35
D	Total Sample Wt. After #200 Wash	44.38	E	Dry Wt.(C-A)	65.03
E	Percent Passing #200 (1-D/C)x100	31.8%	Moisture Content (100 x D/E) (%)		63.6%
Sieve Size (mm)	Sieve Size	Retained Weight	Percent Retained		Percent Passing Total Sample
37.50	1.5"	0.0	0.0%		100.0%
25.00	1.0"	0.00	0.0%		100.0%
19.00	3/4"	0.00	0.0%		100.0%
12.50	1/2"	0.00	0.0%		100.0%
9.50	3/8"	0.00	0.0%		100.0%
4.75	#4	0.94	1.4%		98.6%
2.36	#8	0.68	1.0%		97.5%
1.18	#16	5.01	7.7%		89.8%
0.60	#30	5.82	8.9%		80.9%
0.30	#50	5.69	8.7%		72.1%
0.15	#100	8.72	13.4%		58.7%
0.075	#200	17.52	26.9%		31.8%

<b>Notes:</b>		Maximum Particle Size	Gravel	< 75 mm and > 4.75 mm (#4)	1.4%
		Apparent Relative Density	Coarse Sand	< 4.75 mm and > 2.00 mm (#10)	1.0%
Liquid Limit	48	Fineness Modulus	Medium Sand	< 2.00 mm and > 0.425 mm (#40)	16.7%
Plastic Limit	23	Cu = D60/D10:	Fine Sand	< 0.425 mm and > 0.075 mm (#200)	49.1%
Plastic Index	25	Cc = (D30) <sup>2</sup> / (D10xD60):	% Silt and Clay	< 0.075 mm	31.8%
			Description of Sand & Gravel	Rounded <input checked="" type="checkbox"/> Angular <input checked="" type="checkbox"/>	
			Hard & Durable <input checked="" type="checkbox"/> Soft <input type="checkbox"/> Weathered & Friable <input type="checkbox"/>		

Organic Content				
D10 =	D30 =	D60 =	D50 =	D90 =

ASTM D 422: Particle Size Analysis of Soils

Hydrometer portion of test method not utilized.

ASTM D 421: Dry Preparation of Soil Samples

ASTM D 854: Specific Gravity of Soils

ASTM D 4318: Liquid Limit, Plastic Limit, &amp; Plastic Index of Soils

ASTM D 2487: Classification of Soils for Engineering Purposes (Unified Soil Classification System)

Technician Name:

Brian Urban

Certification #

Technical Responsibility:

Trapp Harris

Signature

Staff Professional

Position





## Liquid Limit, Plastic Limit, and Plastic Index

Project #: **1611-04-386**  
 Project Name: **RBO South Fork Edisto River & Cedar Creek**  
 Client Name: **SCDOT**  
 Client Address: **P.O. Box 191, Columbia, South Carolina, 29202-0191**  
 Boring #: **10** Sample #: **1**

Report Date: **4/27/05**  
 Test Date(s): **4/16/05-4/28/05**

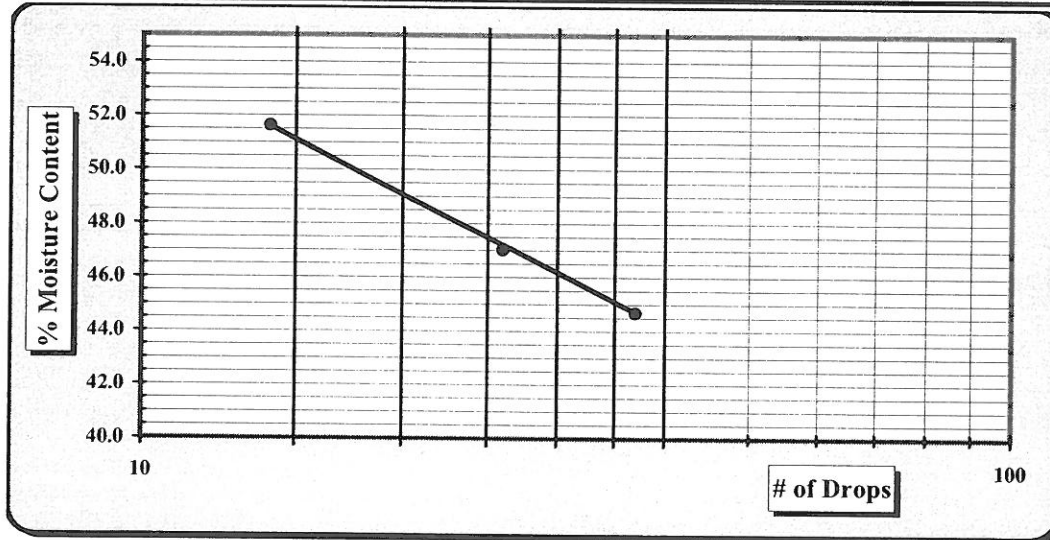
Sample Date: **Various**

Location: **B-10**

Elevation: **15.1'-16.6'**

Sample Description: **Clayey Sand (SC, A-7-6) medium plasticity, fine to medium sand, brown to gray**

Pan #		Liquid Limit						Plastic Limit		
	Test #	1	2	3	4	5	6	1	2	3
	Tare #	103	120	117				139	130	
A	Tare Weight	13.99	13.63	13.79				13.72	13.77	
B	Wet Soil Weight + A	23.30	22.51	23.31				18.60	18.59	
C	Dry Soil Weight + A	20.13	19.67	20.37				17.70	17.69	
D	Water Weight (B-C)	3.17	2.84	2.94				0.90	0.90	
E	Dry Soil Weight (C-A)	6.14	6.04	6.58				3.98	3.92	
F	% Moisture Content (D/E)*100	51.6%	47.0%	44.7%				22.6%	23.0%	
N	# OF DROPS	14	26	37				Moisture Contents determined by ASTM D 2216		
LL	LL = F * FACTOR									
Ave.	Average							22.8%		



One Point Liquid Limit

N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.990	29	1.018
24	0.995	30	1.022
25	1.000		

Notes:

Special Sampling Methods:

Sample Preparation:	Wet Preparation <input type="checkbox"/>	Dry Preparation <input checked="" type="checkbox"/>	Air Dried <input checked="" type="checkbox"/>	NP, Non-Plastic <input type="checkbox"/>
Liquid limit Test:	Multipoint Method <input checked="" type="checkbox"/>	One-point Method <input type="checkbox"/>		Liquid Limit <u>48</u>
Classification:	ASTM D 2487 <input type="checkbox"/>	AASHTO M 145 <input checked="" type="checkbox"/>		Plastic Limit <u>23</u>
Liquid limit Test:	ASTM D 4318 <input type="checkbox"/>	AASHTO T 89 <input checked="" type="checkbox"/>		Plastic Index <u>25</u>
Plastic limit Test:	ASTM D 4318 <input type="checkbox"/>	AASHTO T 90 <input checked="" type="checkbox"/>		Group Symbol <u>A-7-6</u>

Technician Name: Brian Urban

Certification #

Technical Responsibility: Trapp Harris

Signature

Staff Professional

Position

## Particle Size Analysis of Soils

ASTM D 422



Project #: 1611-04-386

Project Name: RBO South Fork Edisto River &amp; Cedar Creek

Client Name: SCDOT

Client Address: PO Box 191, Columbia, South Carolina, 29202-0191

Test Date(s): 4/13/05-4/28/05

Report Date: 5/1/05

Boring #: 10

Sample #: 4

Sample Date: Various

Location: B-10

Elevation: 30.7-32.2'

Sample Description: Clayey Sand (SC, A-6) low plasticity, fine to medium sand, white and purple

Particle Size Analysis / Without Hydrometer Analysis			Moisture Content		Natural
				Tare #	209
	Tare Number	209.0	A	Tare Weight	0.00
A	Tare Weight	0.0	B	Wet Weight + Tare Wt.	149.08
B	Total Sample Dry Wt. + Tare Wt.	0.0	C	Dry Weight + Tare Wt.	130.21
C	Total Sample Dry Weight (B-A)	130.21	D	Water Wt. (B-C)	18.87
D	Total Sample Wt. After #200 Wash	76.58	E	Dry Wt.(C-A)	130.21
E	Percent Passing #200 (1-D/C)x100	41.2%	Moisture Content (100 x D/E) (%)		14.5%
Sieve Size (mm)	Sieve Size	Retained Weight	Percent Retained		Percent Passing Total Sample
37.50	1.5"	0.0	0.0%		100.0%
25.00	1.0"	0.00	0.0%		100.0%
19.00	3/4"	0.00	0.0%		100.0%
12.50	1/2"	0.00	0.0%		100.0%
9.50	3/8"	0.00	0.0%		100.0%
4.75	#4	0.00	0.0%		100.0%
2.36	#8	4.17	3.2%		96.8%
1.18	#16	9.76	7.5%		89.3%
0.60	#30	25.19	19.3%		70.0%
0.30	#50	25.39	19.5%		50.5%
0.15	#100	8.10	6.2%		44.2%
0.075	#200	3.97	3.0%		41.2%

<b>Notes:</b>		Maximum Particle Size	Gravel	< 75 mm and > 4.75 mm (#4)	0.0%
		Apparent Relative Density	Coarse Sand	< 4.75 mm and > 2.00 mm (#10)	3.2%
Liquid Limit	40	Fineness Modulus	Medium Sand	< 2.00 mm and > 0.425 mm (#40)	26.8%
Plastic Limit	21	Cu = D60/D10:	Fine Sand	< 0.425 mm and > 0.075 mm (#200)	28.8%
Plastic Index	19	Cc = (D30) <sup>2</sup> / (D10 x D60):	% Silt and Clay	< 0.075 mm	41.2%
			Description of Sand & Gravel	Rounded <input checked="" type="checkbox"/> Angular <input checked="" type="checkbox"/>	
			Hard & Durable <input checked="" type="checkbox"/> Soft <input type="checkbox"/> Weathered & Friable <input type="checkbox"/>		

Organic Content

D10 =

D30 =

D60 =

D50 =

D90 =

ASTM D 422: Particle Size Analysis of Soils

Hydrometer portion of test method not utilized.

ASTM D 421: Dry Preparation of Soil Samples

ASTM D 854: Specific Gravity of Soils

ASTM D 4318: Liquid Limit, Plastic Limit, &amp; Plastic Index of Soils

ASTM D 2487: Classification of Soils for Engineering Purposes (Unified Soil Classification System)

Technician Name:

Brian Urban

Certification #

Technical Responsibility:

Trapp Harris

Signature

Staff Professional

Position



## Liquid Limit, Plastic Limit, and Plastic Index

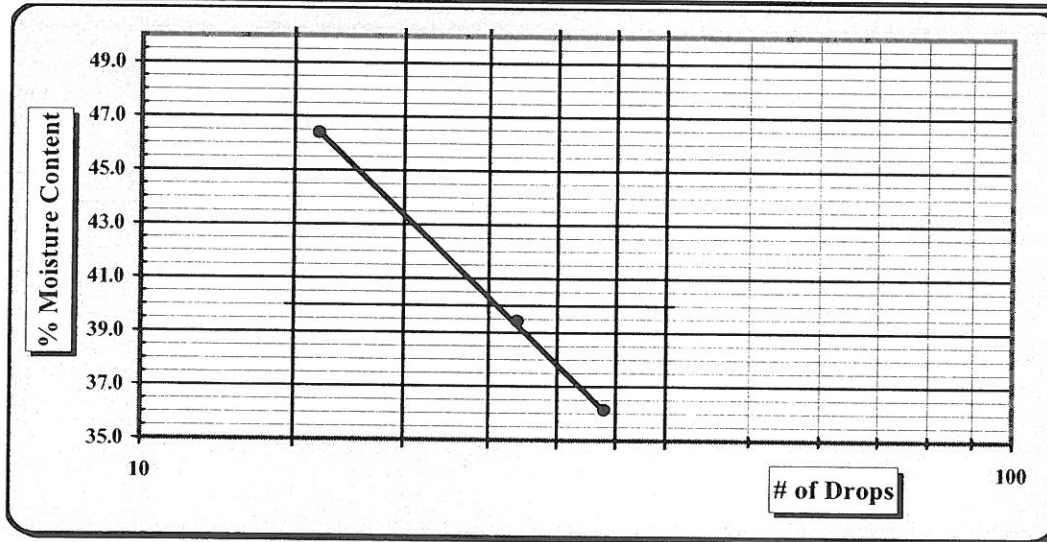
Project #: **1611-04-386**  
 Project Name: **RBO South Fork Edisto River & Cedar Creek**  
 Client Name: **SCDOT**  
 Client Address: **P.O. Box 191, Columbia, South Carolina, 29202-0191**  
 Boring #: **10** Sample #: **4** Sample Date: **Various**

Report Date: **4/26/05**  
 Test Date(s): **4/16/05-4/28/05**

Location: **B-10** Elevation: **30.7-32.2'**

Sample Description: **Clayey Sand (SC, A-6) low plasticity, fine to medium sand, white and purple**

Pan #		Liquid Limit						Plastic Limit		
	Test #	1	2	3	4	5	6	1	2	3
	Tare #	135	105	136				147	119	
A	Tare Weight	13.56	13.63	13.75				13.57	13.59	
B	Wet Soil Weight + A	23.50	22.93	24.94				19.64	19.67	
C	Dry Soil Weight + A	20.35	20.30	21.97				18.60	18.62	
D	Water Weight (B-C)	3.15	2.63	2.97				1.04	1.05	
E	Dry Soil Weight (C-A)	6.79	6.67	8.22				5.03	5.03	
F	% Moisture Content (D/E)*100	46.4%	39.4%	36.1%				20.7%	20.9%	
N	# OF DROPS	16	27	34				Moisture Contents determined by ASTM D 2216		
LL	LL = F * FACTOR									
Ave.	Average							20.8%		



One Point Liquid Limit			
N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.990	29	1.018
24	0.995	30	1.022
25	1.000		

Notes:

### Special Sampling Methods:

Sample Preparation:	Wet Preparation <input type="checkbox"/>	Dry Preparation <input checked="" type="checkbox"/>	Air Dried <input checked="" type="checkbox"/>	NP, Non-Plastic <input type="checkbox"/>
Liquid limit Test:	Multipoint Method <input checked="" type="checkbox"/>	One-point Method <input type="checkbox"/>		Liquid Limit <u>40</u>
Classification:	ASTM D 2487 <input type="checkbox"/>	AASHTO M 145 <input checked="" type="checkbox"/>		Plastic Limit <u>21</u>
Liquid limit Test:	ASTM D 4318 <input type="checkbox"/>	AASHTO T 89 <input checked="" type="checkbox"/>		Plastic Index <u>19</u>
Plastic limit Test:	ASTM D 4318 <input type="checkbox"/>	AASHTO T 90 <input checked="" type="checkbox"/>		Group Symbol <u>A-2-6</u>

Technician Name: Brian Urban

Certification #

Technical Responsibility: Trapp Harris

Signature

Staff Professional

Position

## Particle Size Analysis of Soils

ASTM D 422



Project #: 1611-04-386

Project Name: RBO South Fork Edisto River &amp; Cedar Creek

Client Name: SCDOT

Client Address: PO Box 191, Columbia, South Carolina, 29202-0191

Test Date(s): 4/13/05-4/28/05

Report Date: 5/1/05

Boring #: 10

Sample #: 11

Sample Date: Various

Location: B-10

Elevation: 65.7'-67.2'

Sample Description: Silty Sand (SM, A-2-4) low plasticity, fine to medium sand, white

Particle Size Analysis / Without Hydrometer Analysis			Moisture Content		Natural
				Tare #	205
	Tare Number	205.0	A	Tare Weight	0.00
A	Tare Weight	0.0	B	Wet Weight + Tare Wt.	219.43
B	Total Sample Dry Wt. + Tare Wt.	0.0	C	Dry Weight + Tare Wt.	185.52
C	Total Sample Dry Weight (B-A)	185.52	D	Water Wt. (B-C)	33.91
D	Total Sample Wt. After #200 Wash	161.72	E	Dry Wt.(C-A)	185.52
E	Percent Passing #200 (1-D/C)x100	12.8%	Moisture Content (100 x D/E) (%)		18.3%
Sieve Size (mm)	Sieve Size	Retained Weight	Percent Retained		Percent Passing Total Sample
37.50	1.5"	0.0	0.0%		100.0%
25.00	1.0"	0.00	0.0%		100.0%
19.00	3/4"	0.00	0.0%		100.0%
12.50	1/2"	0.00	0.0%		100.0%
9.50	3/8"	0.00	0.0%		100.0%
4.75	#4	0.00	0.0%		100.0%
2.36	#8	2.21	1.2%		98.8%
1.18	#16	23.13	12.5%		86.3%
0.60	#30	59.37	32.0%		54.3%
0.30	#50	50.23	27.1%		27.3%
0.15	#100	21.17	11.4%		15.9%
0.075	#200	5.61	3.0%		12.8%

<b>Notes:</b>		Maximum Particle Size	Gravel	< 75 mm and > 4.75 mm (#4)	0.0%
		Apparent Relative Density	Coarse Sand	< 4.75 mm and > 2.00 mm (#10)	1.2%
Liquid Limit	29	Fineness Modulus	Medium Sand	< 2.00 mm and > 0.425 mm (#40)	44.5%
Plastic Limit	21	Cu = D60/D10:	Fine Sand	< 0.425 mm and > 0.075 mm (#200)	41.5%
Plastic Index	8	Cc = (D30) <sup>2</sup> / (D10xD60):	% Silt and Clay	< 0.075 mm	12.8%
			Description of Sand & Gravel	Rounded <input checked="" type="checkbox"/> Angular <input checked="" type="checkbox"/>	
			Hard & Durable <input checked="" type="checkbox"/> Soft <input type="checkbox"/> Weathered & Friable <input type="checkbox"/>		

Organic Content				
D10 =	D30 =	D60 =	D50 =	D90 =

ASTM D 422: Particle Size Analysis of Soils

Hydrometer portion of test method not utilized.

ASTM D 421: Dry Preparation of Soil Samples

ASTM D 854: Specific Gravity of Soils

ASTM D 4318: Liquid Limit, Plastic Limit, &amp; Plastic Index of Soils

ASTM D 2487: Classification of Soils for Engineering Purposes (Unified Soil Classification System)

Technician Name:

Brian Urban

Certification #

Technical Responsibility:

Trapp Harris

Signature

Staff Professional

Position





## Liquid Limit, Plastic Limit, and Plastic Index

Project #: **1611-04-386**  
 Project Name: RBO South Fork Edisto River & Cedar Creek  
 Client Name: SCDOT  
 Client Address: P.O. Box 191, Columbia, South Carolina, 29202-0191

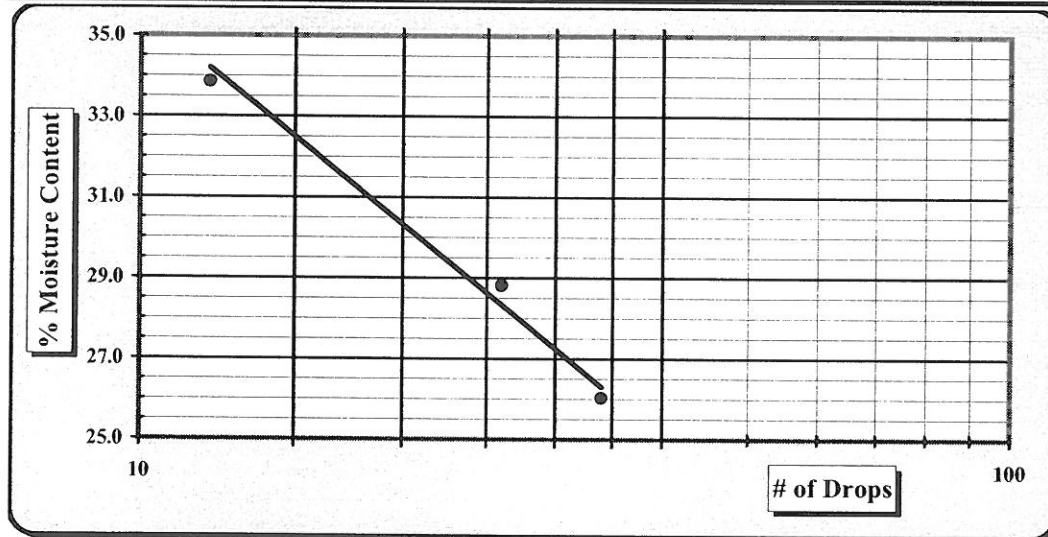
Report Date: 4/26/05  
 Test Date(s): 4/16/05-4/28/05

Boring #: 10 Sample #: 11 Sample Date: Various

Location: B-10 Elevation: 65.7'-67.2'

Sample Description: Silty Sand (SM, A-2-4) low plasticity, fine to medium sand, white

Pan #		Liquid Limit						Plastic Limit		
	Test #	1	2	3	4	5	6	1	2	3
	Tare #	145	110	102				131	140	
A	Tare Weight	13.61	13.75	13.78				13.54	13.69	
B	Wet Soil Weight + A	22.11	22.29	22.98				20.06	20.09	
C	Dry Soil Weight + A	19.96	20.38	21.08				18.88	19.00	
D	Water Weight (B-C)	2.15	1.91	1.90				1.18	1.09	
E	Dry Soil Weight (C-A)	6.35	6.63	7.30				5.34	5.31	
F	% Moisture Content (D/E)*100	33.9%	28.8%	26.0%				22.1%	20.5%	
N	# OF DROPS	12	26	34				Moisture Contents determined by ASTM D 2216		
LL	LL = F * FACTOR									
Ave.	Average							21.3%		



One Point Liquid Limit			
N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.990	29	1.018
24	0.995	30	1.022
25	1.000		

Notes:

### Special Sampling Methods:

Sample Preparation:	Wet Preparation <input type="checkbox"/>	Dry Preparation <input checked="" type="checkbox"/>	Air Dried <input checked="" type="checkbox"/>	NP, Non-Plastic <input type="checkbox"/>
Liquid limit Test:	Multipoint Method <input checked="" type="checkbox"/>	One-point Method <input type="checkbox"/>		Liquid Limit 29
Classification:	ASTM D 2487 <input type="checkbox"/>	AASHTO M 145 <input checked="" type="checkbox"/>		Plastic Limit 21
Liquid limit Test:	ASTM D 4318 <input type="checkbox"/>	AASHTO T 89 <input checked="" type="checkbox"/>		Plastic Index 8
Plastic limit Test:	ASTM D 4318 <input type="checkbox"/>	AASHTO T 90 <input checked="" type="checkbox"/>		Group Symbol A-2-4

Technician Name: Brian Urban

Certification #

Technical Responsibility: Trapp Harris

Signature

Staff Professional

Position



## Particle Size Analysis of Soils

ASTM D 422



Project #: 1611-04-386

Project Name: RBO South Fork Edisto River &amp; Cedar Creek

Client Name: SCDOT

Client Address: PO Box 191, Columbia, SC 29202-0191

Test Date(s): 4/13/05-4/28/05

Report Date: 5/1/05

Boring #: 11

Sample #: 11

Sample Date: Various

Location: B-11

Elevation: 64.0'-65.5'

Sample Description: Silty Sand (SM, A-2-4) low plasticity, fine to medium sand, white with purple

Particle Size Analysis / Without Hydrometer Analysis			Moisture Content		Natural
				Tare #	314
	Tare Number	314.0	A	Tare Weight	0.00
A	Tare Weight	0.0	B	Wet Weight + Tare Wt.	151.98
B	Total Sample Dry Wt. + Tare Wt.	0.0	C	Dry Weight + Tare Wt.	132.71
C	Total Sample Dry Weight (B-A)	132.71	D	Water Wt. (B-C)	19.27
D	Total Sample Wt. After #200 Wash	117.09	E	Dry Wt.(C-A)	132.71
E	Percent Passing #200 (1-D/C)x100	11.8%	Moisture Content (100 x D/E) (%)		14.5%
Sieve Size (mm)	Sieve Size	Retained Weight	Percent Retained		Percent Passing Total Sample
37.50	1.5"	0.0	0.0%		100.0%
25.00	1.0"	0.00	0.0%		100.0%
19.00	3/4"	0.00	0.0%		100.0%
12.50	1/2"	0.00	0.0%		100.0%
9.50	3/8"	0.00	0.0%		100.0%
4.75	#4	0.00	0.0%		100.0%
2.36	#8	2.22	1.7%		98.3%
1.18	#16	14.60	11.0%		87.3%
0.60	#30	42.47	32.0%		55.3%
0.30	#50	38.79	29.2%		26.1%
0.15	#100	15.45	11.6%		14.5%
0.075	#200	3.56	2.7%		11.8%

<b>Notes:</b>		Maximum Particle Size	Gravel	< 75 mm and > 4.75 mm (#4)	0.0%
		Apparent Relative Density	Coarse Sand	< 4.75 mm and > 2.00 mm (#10)	1.7%
Liquid Limit	27	Fineness Modulus	Medium Sand	< 2.00 mm and > 0.425 mm (#40)	43.0%
Plastic Limit	20	Cu = D60/D10:	Fine Sand	< 0.425 mm and > 0.075 mm (#200)	43.6%
Plastic Index	7	Cc = (D30) <sup>2</sup> / (D10xD60):	% Silt and Clay	< 0.075 mm	11.8%
			Description of Sand & Gravel	Rounded <input checked="" type="checkbox"/> Angular <input checked="" type="checkbox"/>	
			Hard & Durable <input checked="" type="checkbox"/> Soft <input type="checkbox"/> Weathered & Friable <input type="checkbox"/>		

Organic Content

D10 =

D30 =

D60 =

D50 =

D90 =

ASTM D 422: Particle Size Analysis of Soils

Hydrometer portion of test method not utilized.

ASTM D 421: Dry Preparation of Soil Samples

ASTM D 854: Specific Gravity of Soils

ASTM D 4318: Liquid Limit, Plastic Limit, &amp; Plastic Index of Soils

ASTM D 2487: Classification of Soils for Engineering Purposes (Unified Soil Classification System)

Technician Name:

Brian Urban

Certification #

Technical Responsibility:

Trapp Harris

Signature

Staff Professional

Position



## Liquid Limit, Plastic Limit, and Plastic Index

Project #: **1611-04-386**  
 Project Name: RBO South Fork Edisto River & Cedar Creek  
 Client Name: SCDOT  
 Client Address: P.O. Box 191, Columbia, South Carolina, 29202-0191

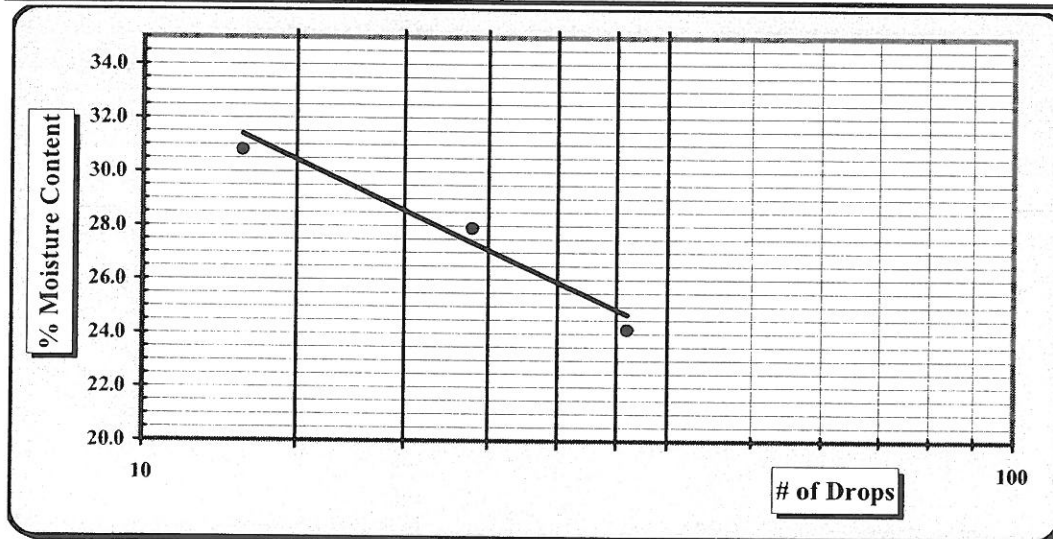
Report Date: 4/27/05  
 Test Date(s): 4/16/05-4/28/05

Boring #: 11 Sample #: 11 Sample Date: Various

Location: B-11 Elevation: 64.0'-65.5'

Sample Description: Silty Sand (SM, A-2-4) low plasticity, fine to medium sand, white with purple

Pan #		Liquid Limit						Plastic Limit		
	Test #	1	2	3	4	5	6	1	2	3
	Tare #	112	129	101				144	146	
A	Tare Weight	13.78	13.88	13.64				13.73	13.51	
B	Wet Soil Weight + A	23.59	22.04	23.46				20.13	19.58	
C	Dry Soil Weight + A	21.28	20.26	21.55				19.07	18.60	
D	Water Weight (B-C)	2.31	1.78	1.91				1.06	0.98	
E	Dry Soil Weight (C-A)	7.50	6.38	7.91				5.34	5.09	
F	% Moisture Content (D/E)*100	30.8%	27.9%	24.1%				19.9%	19.3%	
N	# OF DROPS	13	24	36				Moisture Contents determined by ASTM D 2216		
LL	LL = F * FACTOR									
Ave.	Average							19.6%		



One Point Liquid Limit			
N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.990	29	1.018
24	0.995	30	1.022
25	1.000		

Notes:

### Special Sampling Methods:

Sample Preparation:	Wet Preparation <input type="checkbox"/>	Dry Preparation <input checked="" type="checkbox"/>	Air Dried <input checked="" type="checkbox"/>	NP, Non-Plastic <input type="checkbox"/>
Liquid limit Test:	Multipoint Method <input checked="" type="checkbox"/>	One-point Method <input type="checkbox"/>		Liquid Limit 27
Classification:	ASTM D 2487 <input type="checkbox"/>	AASHTO M 145 <input checked="" type="checkbox"/>		Plastic Limit 20
Liquid limit Test:	ASTM D 4318 <input type="checkbox"/>	AASHTO T 89 <input checked="" type="checkbox"/>		Plastic Index 7
Plastic limit Test:	ASTM D 4318 <input type="checkbox"/>	AASHTO T 90 <input checked="" type="checkbox"/>		Group Symbol A-2-4

Technician Name: Brian Urban

Certification #

Technical Responsibility: Trapp Harris

Signature

Staff Professional

Position

## Particle Size Analysis of Soils

ASTM D 422



Project #: 1611-04-386

Project Name: RBO South Fork Edisto River &amp; Cedar Creek

Client Name: SCDOT

Client Address: PO Box 191, Columbia, SC 29202-0191

Test Date(s): 4/13/05-4/28/05

Report Date: 5/1/05

Boring #: 12

Sample #: 10

Sample Date: Various

Location: B-12

Elevation: 65.0'-66.5'

Sample Description: Silty Sand (SM, A-1-b) low plasticity, fine to medium sand, white and purple

Particle Size Analysis / Without Hydrometer Analysis			Moisture Content		Natural
				Tare #	405
	Tare Number	405.0	A	Tare Weight	0.00
A	Tare Weight	0.0	B	Wet Weight + Tare Wt.	133.57
B	Total Sample Dry Wt. + Tare Wt.	0.0	C	Dry Weight + Tare Wt.	112.04
C	Total Sample Dry Weight (B-A)	112.04	D	Water Wt. (B-C)	21.53
D	Total Sample Wt. After #200 Wash	98.09	E	Dry Wt.(C-A)	112.04
E	Percent Passing #200 (1-D/C)x100	12.5%	Moisture Content (100 x D/E) (%)		19.2%
Sieve Size (mm)	Sieve Size	Retained Weight	Percent Retained		Percent Passing Total Sample
37.50	1.5"	0.0	0.0%		100.0%
25.00	1.0"	0.00	0.0%		100.0%
19.00	3/4"	0.00	0.0%		100.0%
12.50	1/2"	0.00	0.0%		100.0%
9.50	3/8"	0.00	0.0%		100.0%
4.75	#4	0.00	0.0%		100.0%
2.36	#8	2.35	2.1%		97.9%
1.18	#16	18.87	16.8%		81.1%
0.60	#30	34.93	31.2%		49.9%
0.30	#50	25.02	22.3%		27.6%
0.15	#100	14.66	13.1%		14.5%
0.075	#200	2.26	2.0%		12.5%

<b>Notes:</b>		Maximum Particle Size	Gravel	< 75 mm and > 4.75 mm (#4)	0.0%
		Apparent Relative Density	Coarse Sand	< 4.75 mm and > 2.00 mm (#10)	2.1%
Liquid Limit	28	Fineness Modulus	Medium Sand	< 2.00 mm and > 0.425 mm (#40)	48.0%
Plastic Limit	23	Cu = D60/D10:	Fine Sand	< 0.425 mm and > 0.075 mm (#200)	37.4%
Plastic Index	5	Cc = (D30) <sup>2</sup> / (D10xD60):	% Silt and Clay	< 0.075 mm	12.5%
			Description of Sand & Gravel	Rounded <input checked="" type="checkbox"/>	Angular <input checked="" type="checkbox"/>
			Hard & Durable <input checked="" type="checkbox"/>	Soft <input type="checkbox"/>	Weathered & Friable <input type="checkbox"/>

Organic Content

D10 =

D30 =

D60 =

D50 =

D90 =

ASTM D 422: Particle Size Analysis of Soils

Hydrometer portion of test method not utilized.

ASTM D 421: Dry Preparation of Soil Samples

ASTM D 854: Specific Gravity of Soils

ASTM D 4318: Liquid Limit, Plastic Limit, &amp; Plastic Index of Soils

ASTM D 2487: Classification of Soils for Engineering Purposes (Unified Soil Classification System)

Technician Name:

Brian Urban

Certification #

Technical Responsibility:

Trapp Harris

Signature

Staff Professional

Position



## Liquid Limit, Plastic Limit, and Plastic Index

Project #: **1611-04-386**  
 Project Name: **RBO South Fork Edisto River & Cedar Creek**  
 Client Name: **SCDOT**  
 Client Address: **P.O. Box 191, Columbia, South Carolina, 29202-0191**  
 Boring #: **12** Sample #: **10**  
 Location: **B-12**

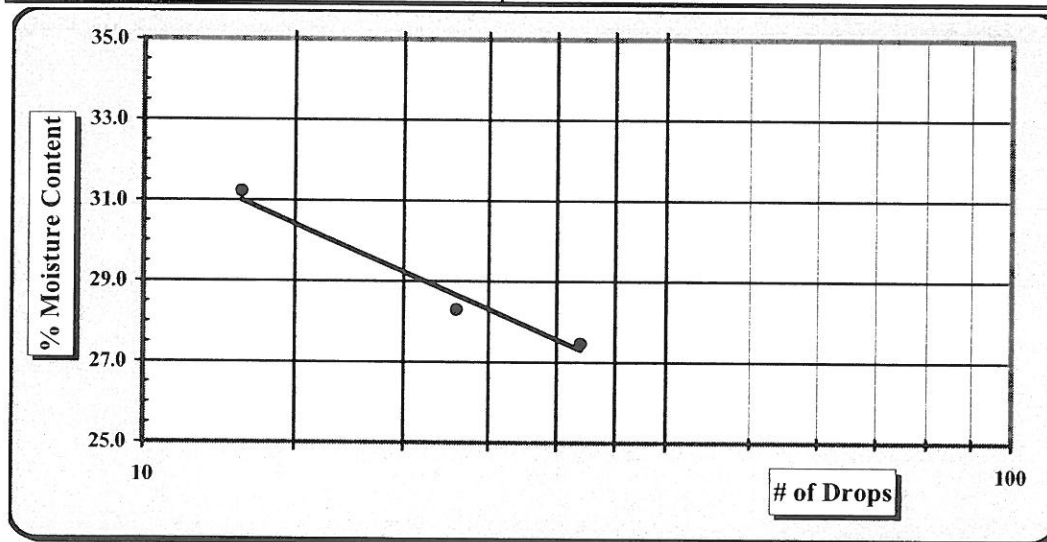
Report Date: **4/26/05**  
 Test Date(s): **4/16/05-4/28/05**

Sample Date: Various

Elevation: 65.0'-66.5'

Sample Description: **Silty Sand (SM, A-1-b) low plasticity, fine to medium sand, white and purple**

Pan #		Liquid Limit						Plastic Limit		
	Test #	1	2	3	4	5	6	1	2	3
	Tare #	133	122	134				104	116	
A	Tare Weight	13.76	13.73	13.73				13.70	13.67	
B	Wet Soil Weight + A	24.73	24.34	25.01				18.90	19.49	
C	Dry Soil Weight + A	22.12	22.00	22.58				17.91	18.40	
D	Water Weight (B-C)	2.61	2.34	2.43				0.99	1.09	
E	Dry Soil Weight (C-A)	8.36	8.27	8.85				4.21	4.73	
F	% Moisture Content (D/E)*100	31.2%	28.3%	27.5%				23.5%	23.0%	
N	# OF DROPS	13	23	32				Moisture Contents determined by ASTM D 2216		
LL	LL = F * FACTOR									
Ave.	Average							23.3%		



One Point Liquid Limit			
N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.990	29	1.018
24	0.995	30	1.022
25	1.000		

Notes:

### Special Sampling Methods:

Sample Preparation:	Wet Preparation <input type="checkbox"/>	Dry Preparation <input checked="" type="checkbox"/>	Air Dried <input checked="" type="checkbox"/>	NP, Non-Plastic <input type="checkbox"/>
Liquid limit Test:	Multipoint Method <input checked="" type="checkbox"/>	One-point Method <input type="checkbox"/>		Liquid Limit <u>28</u>
Classification:	ASTM D 2487 <input type="checkbox"/>	AASHTO M 145 <input checked="" type="checkbox"/>		Plastic Limit <u>23</u>
Liquid limit Test:	ASTM D 4318 <input type="checkbox"/>	AASHTO T 89 <input checked="" type="checkbox"/>		Plastic Index <u>5</u>
Plastic limit Test:	ASTM D 4318 <input type="checkbox"/>	AASHTO T 90 <input checked="" type="checkbox"/>		Group Symbol <u>A-1-b</u>

Technician Name: Brian Urban

Certification #

Technical Responsibility: Trapp Harris

Signature

Staff Professional

Position





# Particle Size Analysis of Soils

Laboratory Record Version 4.0

Report Date:

4/29/05

Project #: 1611-04-386

Test Date(s): 4/13/05-4/28/05

Project Name: RBO South Fork Edisto River & Cedar Creek

Client Name: SCDOT

Client Address: P.O. Box 191, Columbia, South Carolina, 29202-0191

Boring #: 13

Sample #: 1

Sample Date: Various

Elevation: 15.0'-16.5'

Sample Description: Silty Sand (SM, A-2-4) low plasticity, fine sand, brown

Pan #:	5	Beaker #:	5	Specific Gravity:	2.550	Sieve	Retained Wt.	Percent Passing
Hydrometer Jar #:			8369	Pan # (washed sample):		3.0"	0.0	100.0%
Pan Tare Weight (grams):			0.00	Moisture Content		1.5"	0.0	100.0%
Total Sample Wet Wt. + tare wt. (grams):			115.33	Tare #	114	1.0"	0.0	100.0%
Weight of Total Sample Air Dried:			115.33	A	Tare Wt.	3/4"	0.0	100.0%
Weight of Air Dried Hydrometer Sample (g):			115.33	B	Wet Wt. + A	1/2"	0.0	100.0%
Total Sample Oven Dried:			114.75	C	Dry Wt. + A	3/8"	0.0	100.0%
Hydrometer Sample Oven Dried (W):			114.75	D	Water Wt. (B-C)	#4	0.0	100.0%
% Passing #10:			100.0%	E	Dry Wt. (C-A)	#10	0.0	100.0%
Correction Factor a (Table 1):			1.02	% Moisture (100 x D/E)	0.51%	#30	0.0	100.0%
						#40	1.2	99.0%
						#50	3.0	97.4%
						#100	43.5	62.1%
						#200	88.5	22.9%

Notes: Description of Sand & Gravel Particles:

Maximum Particle Size:		Rounded <input checked="" type="checkbox"/>	Angular <input checked="" type="checkbox"/>	Hard & Durable <input checked="" type="checkbox"/>	Soft <input type="checkbox"/>	Weathered & Friable <input type="checkbox"/>
% Gravel:	0.0%	Total Sand:	77.1%	< 4.74 mm and > 0.075 mm	Type:	Mechanical Stirring Apparatus (A)
Coarse Sand:	0.0%	Silt & Clay:	22.9%	< 0.075	Dispersion Time:	1 min.
Medium Sand:	1.0%	Silt:	11.9%	< 0.075 and > 0.005 mm	Sodium Hexametaphosphate:	40 g./ Liter
Fine Sand:	76.1%	Clay:	11.0%	< 0.005 mm	Hydrometer:	151H <input type="checkbox"/> 152H <input checked="" type="checkbox"/>
		Colloids:	7.0%	< 0.001 mm		

Time	Temp. (°C)	Hydrometer Reading	Corrections		Hydrometer R	Percent Passing		Table 2	Table 3	Diameter D = K x (L/T) <sup>1/2</sup>
			Control Cylinder	Composite Correction		P(-#10) = (R x a / W) x 100	P (total) = P x % Passing #10			
11:58	2	23.1	4.0	3.0	18.0	16.0%	16.0%	13.3	0.01358	0.03502
12:01	5	23.1	4.0	3.0	17.0	15.1%	15.1%	13.5	0.01358	0.02231
12:11	15	23.1	4.0	3.0	16.0	14.2%	14.2%	13.7	0.01358	0.01298
12:24	30	23.1	4.0	3.0	14.0	12.4%	12.4%	14.0	0.01358	0.00928
12:56	60	23.0	4.0	3.0	13.0	11.6%	11.6%	14.2	0.01358	0.00661
4:06	250	21.6	4.0	3.5	11.0	9.8%	9.8%	14.5	0.01391	0.00335
11:56	1440	22.0	4.0	3.3	8.0	7.1%	7.1%	15.0	0.01374	0.00140
11:56	2880	22.0	4.0	3.3	7.0	6.2%	6.2%	15.2	0.01374	0.00100

Technician Name / Certification #

## References:

ASTM D 421: Dry Preparation of Soil Samples	ASTM D 422: Particle Size Analysis of Soils
ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass	ASTM D 854: Specific Gravity of Soils
ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils	
ASTM D 2487: Classification of Soils for Engineering Purposes (Unified Soil Classification System)	

Brian Urban

Technical Responsibility: Trapp Harris

Position: Staff Professional

S&ME, INC.

134 Suber Road, Columbia, S.C. 29210



# Particle Size Analysis of Soils

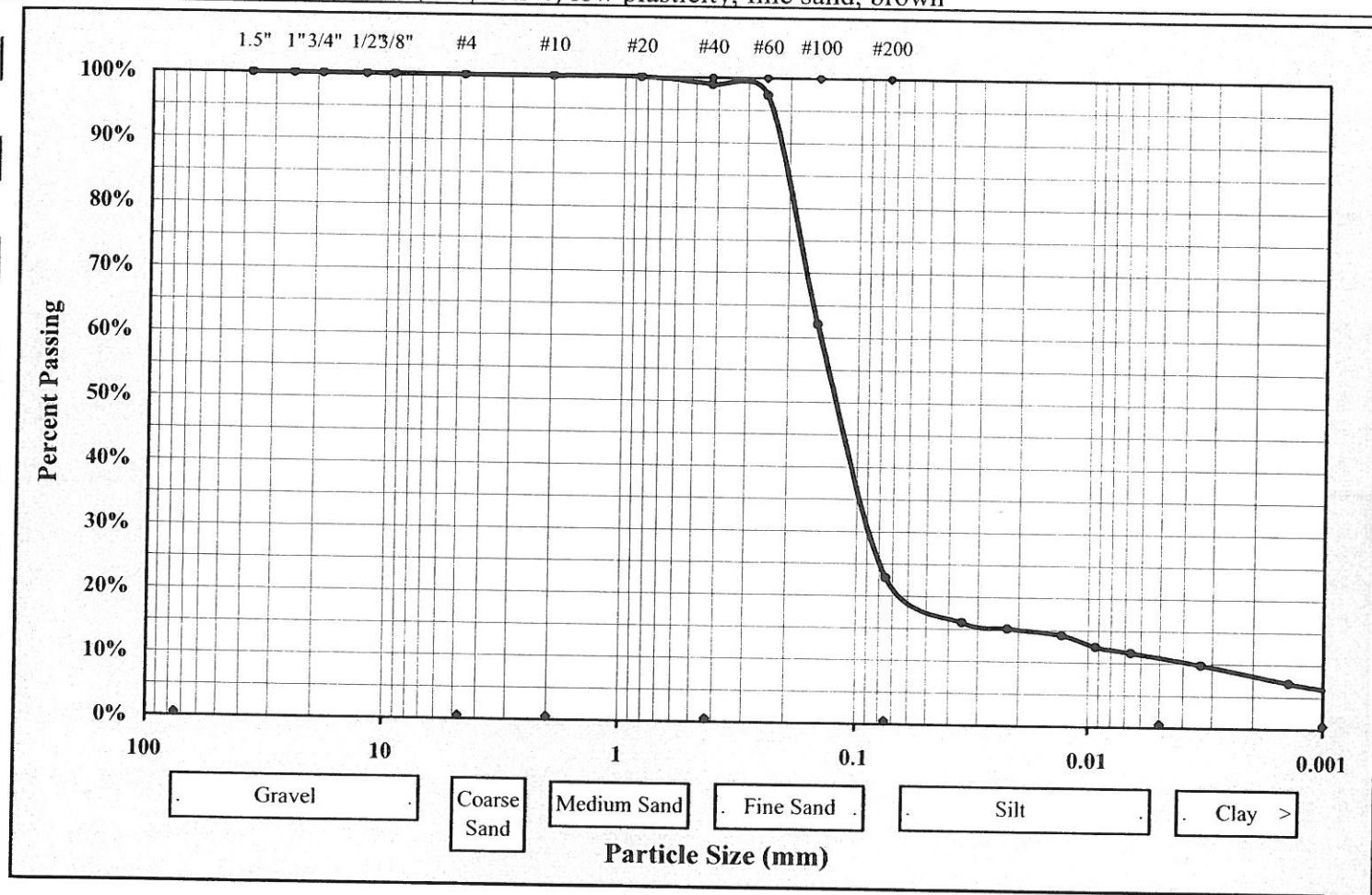
ASTM D 422



S&ME Project #: **1611-04-386**  
 Project Name: **RBO South Fork Edisto River & Cedar Creek**  
 Client Name: **SCDOT**  
 Client Address: **P.O. Box 191, Columbia, South Carolina, 29202-0191**

Report Date: **4/29/05**  
 Test Date(s): **4/13/05-4/28/05**

Boring #: **13** Sample #: **1** Sample Date: **Various**  
 Location: **B-13** Elevation: **15.0'-16.5'**  
 Sample Description: **Silty Sand (SM, A-2-4) low plasticity, fine sand, brown**



Moisture Content		Gravel	0.0%	Liquid Limit	18
Silt & Clay (% Passing #200)	22.9%	Sand	77.1%	Plastic Limit	17
Maximum Particle Size	0	Silt	11.9%	Plastic Index	1
Specific Gravity	2.550	Clay	11.0%	Colloids	7.0%

Description of Sand & Gravel Particles: Rounded ☒ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐  
 ASTM D 422: Particle Size Analysis of Soils  
 Dispersing Agent: Sodium Hexametaphosphate: 40 g./ Liter  
 Mechanical Stirring Apparatus (A) Length of Dispersion Period: 1 min.

References: ASTM D 854: Specific Gravity of Soils  
 ASTM D 421: Dry Preparation of Soil Samples  
 ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass  
 ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils  
 ASTM D 2487: Classification of Soils for Engineering Purposes (Unified Soil Classification System)

Technical Responsibility / Position: **Trapp Harris**

Staff Professional



## SPECIFIC GRAVITY OF SOILS

Test Method A

### ASTM D-854

PROJECT NO 1611-05-386 BORING NO B-13  
 PROJECT NAME RBO South Fork Edisto & Cedar Creek SAMPLE NO 1  
 DATE 4/21/2005 DEPTH 15.0'-16.5'  
 DESCRIPTION Silty Sand (SM, A-2-4) low plasticity, fine sand, brown  
 TESTED BY BU COMPUTED BY BU CHECKED BY BU

VOL FLASK NO	1. WT. OF SOIL & VOL FLASK	2. Wt. of flask	A. WT. OF SOIL	B. WT. OF VOL. (from vol. Flask chart) FLASK & WATER	WATER TEM	C. WT. OF VOL. FLASK, SOIL & WATER	D. SPECIFIC GRAVITY = $\frac{A}{A+(B-C)}$
<u>2</u>	<u>84.64</u> g	<u>64.53</u> g	<u>20.11</u> g	<u>164.155</u> g	<u>27</u> °C	<u>176.39</u> g	$\frac{20.11}{20.11 + (164.155 - 176.39)} = 2.554$ g

SPECIFIC GRAVITY (CORRECTED)  $G_s = D \cdot K =$

H <sub>2</sub> O TEMP. °C	CORRECTION FACTOR, K
18	1.0004
19	1.0002
20	1.0000
21	0.9998
22	0.9996
23	0.9993
24	0.9991
25	0.9989
26	0.9986
27	0.9983
28	0.9980
29	0.9977
30	0.9974

FLASK NO. 2  
 $G_s = D \cdot K = 2.550$

FLASK NO. 0  
 $G_s = D \cdot K =$

FLASK NO. 0  
 $G_s = D \cdot K =$

AVERAGE  
 $G_s = \boxed{2.550}$

## Particle Size Analysis of Soils

ASTM D 422



Project #: 1611-04-386

Project Name: RBO South Fork Edisto River &amp; Cedar Creek

Client Name: SCDOT

Client Address: PO Box 191, Columbia, South Carolina, 29202-0191

Test Date(s): 4/13/05-4/28/05

Report Date: 5/1/05

Boring #: 13

Sample #: 1

Sample Date: Various

Location: B-13

Elevation: 15.0'-16.5'

Sample Description: Silty Sand (SM, A-2-4) low plasticity, fine sand, brown

Particle Size Analysis / Without Hydrometer Analysis			Moisture Content		Natural
				Tare #	5
	Tare Number	5.0	A	Tare Weight	0.00
A	Tare Weight	0.0	B	Wet Weight + Tare Wt.	24.11
B	Total Sample Dry Wt. + Tare Wt.	0.0	C	Dry Weight + Tare Wt.	19.21
C	Total Sample Dry Weight (B-A)	115.33	D	Water Wt. (B-C)	4.90
D	Total Sample Wt. After #200 Wash	88.50	E	Dry Wt.(C-A)	19.21
E	Percent Passing #200 (1-D/C)x100	23.3%	Moisture Content (100 x D/E) (%)		25.5%
Sieve Size (mm)	Sieve Size	Retained Weight	Percent Retained		Percent Passing Total Sample
37.50	1.5"	0.0	0.0%		100.0%
25.00	1.0"	0.00	0.0%		100.0%
19.00	3/4"	0.00	0.0%		100.0%
12.50	1/2"	0.00	0.0%		100.0%
9.50	3/8"	0.00	0.0%		100.0%
4.75	#4	0.00	0.0%		100.0%
2.36	#8	0.00	0.0%		100.0%
1.18	#16	0.00	0.0%		100.0%
0.60	#30	0.00	0.0%		100.0%
0.30	#50	3.00	2.6%		97.4%
0.15	#100	40.50	35.1%		62.3%
0.075	#200	45.00	39.0%		23.3%

Notes: Maximum Particle Size		Gravel	< 75 mm and > 4.75 mm (#4)	0.0%
Apparent Relative Density		Coarse Sand	< 4.75 mm and > 2.00 mm (#10)	0.0%
Liquid Limit	Fineness Modulus	Medium Sand	< 2.00 mm and > 0.425 mm (#40)	0.0%
Plastic Limit	Cu = D60/D10:	Fine Sand	< 0.425 mm and > 0.075 mm (#200)	76.7%
Plastic Index	Cc = (D30) <sup>2</sup> / (D10xD60):	% Silt and Clay	< 0.075 mm	23.3%
		Description of Sand & Gravel	Rounded <input checked="" type="checkbox"/> Angular <input checked="" type="checkbox"/>	
		Hard & Durable <input checked="" type="checkbox"/> Soft <input type="checkbox"/> Weathered & Friable <input type="checkbox"/>		

Organic Content

D10 =

D30 =

D60 =

D50 =

D90 =

ASTM D 422: Particle Size Analysis of Soils

Hydrometer portion of test method not utilized.

ASTM D 421: Dry Preparation of Soil Samples

ASTM D 854: Specific Gravity of Soils

ASTM D 4318: Liquid Limit, Plastic Limit, &amp; Plastic Index of Soils

ASTM D 2487: Classification of Soils for Engineering Purposes (Unified Soil Classification System)

Technician Name:

Brian Urban

Certification #

Technical Responsibility:

Trapp Harris

Signature

Staff Professional

Position



## Liquid Limit, Plastic Limit, and Plastic Index

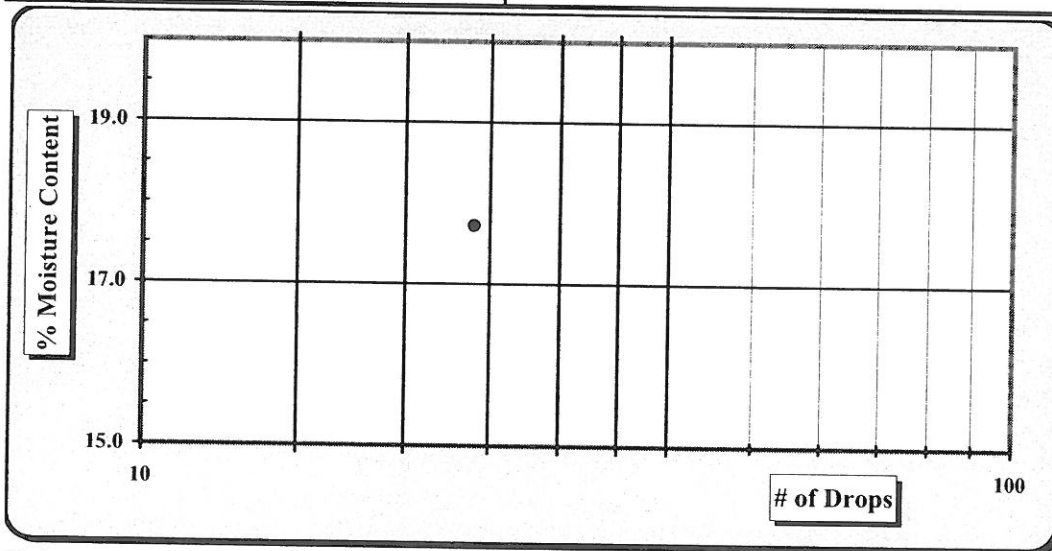
Project #: **1611-04-386**  
 Project Name: RBO South Fork Edisto River & Cedar Creek  
 Client Name: SCDOT  
 Client Address: P.O. Box 191, Columbia, South Carolina, 29202-0191  
 Boring #: 13 Sample #: 1

Report Date: 4/26/05  
 Test Date(s): 4/16/05-4/28/05

Location: B-13 Elevation: 15.0'-16.5'

Sample Description: Silty Sand (SM, A-2-4) low plasticity, fine sand, brown

Pan #		Liquid Limit						Plastic Limit		
	Test #	1	2	3	4	5	6	1	2	3
	Tare #		59					44		
A	Tare Weight		11.31					11.47		
B	Wet Soil Weight + A		17.82					14.85		
C	Dry Soil Weight + A		16.84					14.36		
D	Water Weight (B-C)		0.98					0.49		
E	Dry Soil Weight (C-A)		5.53					2.89		
F	% Moisture Content (D/E)*100		17.7%					17.0%		
N	# OF DROPS		24					Moisture Contents determined by ASTM D 2216		
LL	LL = F * FACTOR		17.6%							
Ave.	Average							17.0%		



One Point Liquid Limit			
N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.990	29	1.018
24	0.995	30	1.022
25	1.000		

Notes:

### Special Sampling Methods:

Sample Preparation:	Wet Preparation <input type="checkbox"/>	Dry Preparation <input checked="" type="checkbox"/>	Air Dried <input checked="" type="checkbox"/>	NP, Non-Plastic <input type="checkbox"/>
Liquid limit Test:	Multipoint Method <input checked="" type="checkbox"/>	One-point Method <input type="checkbox"/>		Liquid Limit 18
Classification:	ASTM D 2487 <input type="checkbox"/>	AASHTO M 145 <input checked="" type="checkbox"/>		Plastic Limit 17
Liquid limit Test:	ASTM D 4318 <input type="checkbox"/>	AASHTO T 89 <input checked="" type="checkbox"/>		Plastic Index 1
Plastic limit Test:	ASTM D 4318 <input type="checkbox"/>	AASHTO T 90 <input checked="" type="checkbox"/>		Group Symbol A-1-b

Technician Name: Brian Urban

Certification #

Technical Responsibility: Trapp Harris

Signature

Staff Professional

Position





Particle Size Analysis of Soils

Laboratory Record Version 4.0

Report Date:

4/29/05

Project #: 1611-04-386

Test Date(s):

4/13/05-4/28/05

Liquid Limit:

Project Name:

RBO South Fork Edisto River & Cedar Creek

Plastic Limit:

Client Name:

SCDOT

Plastic Index:

Client Address:

P.O. Box 191, Columbia, South Carolina, 29202-0191

Boring #: 13

Sample #: 2

Sample Date: Various

Location: B-13

Elevation: 18.0'-19.5'

Sample Description: Poorly Graded Sand (SP, A-1-b) low plasticity, fine sand, tan

Pan #:	12	Beaker #:	12	Specific Gravity:	2.594
Hydrometer Jar #:				Pan # (washed sample):	
Pan Tare Weight (grams):				Moisture Content	Natural
Total Sample Wet Wt. + tare wt. (grams):				Tare #	
Weight of Total Sample Air Dried:				A Tare Wt.	13.56
Weight of Air Dried Hydrometer Sample (g):				B Wet Wt. + A	35.10
Total Sample Oven Dried:				C Dry Wt. + A	35.05
Hydrometer Sample Oven Dried (W):				D Water Wt. (B-C)	0.05
% Passing #10:				E Dry Wt.(C-A)	21.49
Correction Factor a (Table 1):				% Moisture (100 x D/E)	0.23%

Notes:	Description of Sand & Gravel Particles:	Rounded <input checked="" type="checkbox"/>	Angular <input checked="" type="checkbox"/>	Hard & Durable <input checked="" type="checkbox"/>	Soft <input type="checkbox"/>	Weathered & Friable <input type="checkbox"/>
Maximum Particle Size:		Total Sand:	97.2%	< 4.74 mm and > 0.075 mm	Type:	Mechanical Stirring Apparatus (A)
% Gravel:	0.0%	Silt & Clay:	2.8%	< 0.075	Dispersion Time:	1 min.
Coarse Sand:	0.0%					
Medium Sand:	11.5%					Sodium Hexametaphosphate: 40 g/ Liter
Fine Sand:	85.7%					

Time	Temp.	Hydrometer	Corrections		Hydrometer	Percent Passing		Table 2	Table 3	Diameter D = K x (L/T) <sup>1/2</sup>
			Control	Composite		P(#10) = (R x a / W) x 100	P (total) = P x % Passing #10			
Clock	T (Min.)	Reading	Cylinder	Correction	R			L	K	
12:28	2	6.0	4.0	3.0	2.0	1.8%	1.8%	16.0	0.01358	0.03841
12:31	5	6.0	4.0	3.0	2.0	1.8%	1.8%	16.0	0.01358	0.02429
12:41	15	6.0	4.0	3.0	2.0	1.8%	1.8%	16.0	0.01358	0.01403
12:56	30	5.0	4.0	3.2	1.0	0.9%	0.9%	16.1	0.01374	0.01007
1:26	60	5.0	4.0	3.2	1.0	0.9%	0.9%	16.1	0.01374	0.00712
4:36	250	5.0	4.0	3.5	1.0	0.9%	0.9%	16.1	0.01391	0.00353
12:26	1440	5.0	4.0	3.3	1.0	0.9%	0.9%	16.1	0.01374	0.00145
12:26	2880	5.0	4.0	3.3	1.0	0.9%	0.9%	16.1	0.01374	0.00103

Technician Name / Certification #		References:	
Brian Urban		ASTM D 421: Dry Preparation of Soil Samples	
		ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass	
		ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils	
		ASTM D 2487: Classification of Soils for Engineering Purposes (Unified Soil Classification System)	
Technical Responsibility: Trapp Harris		Position: Staff Professional	



# Particle Size Analysis of Soils

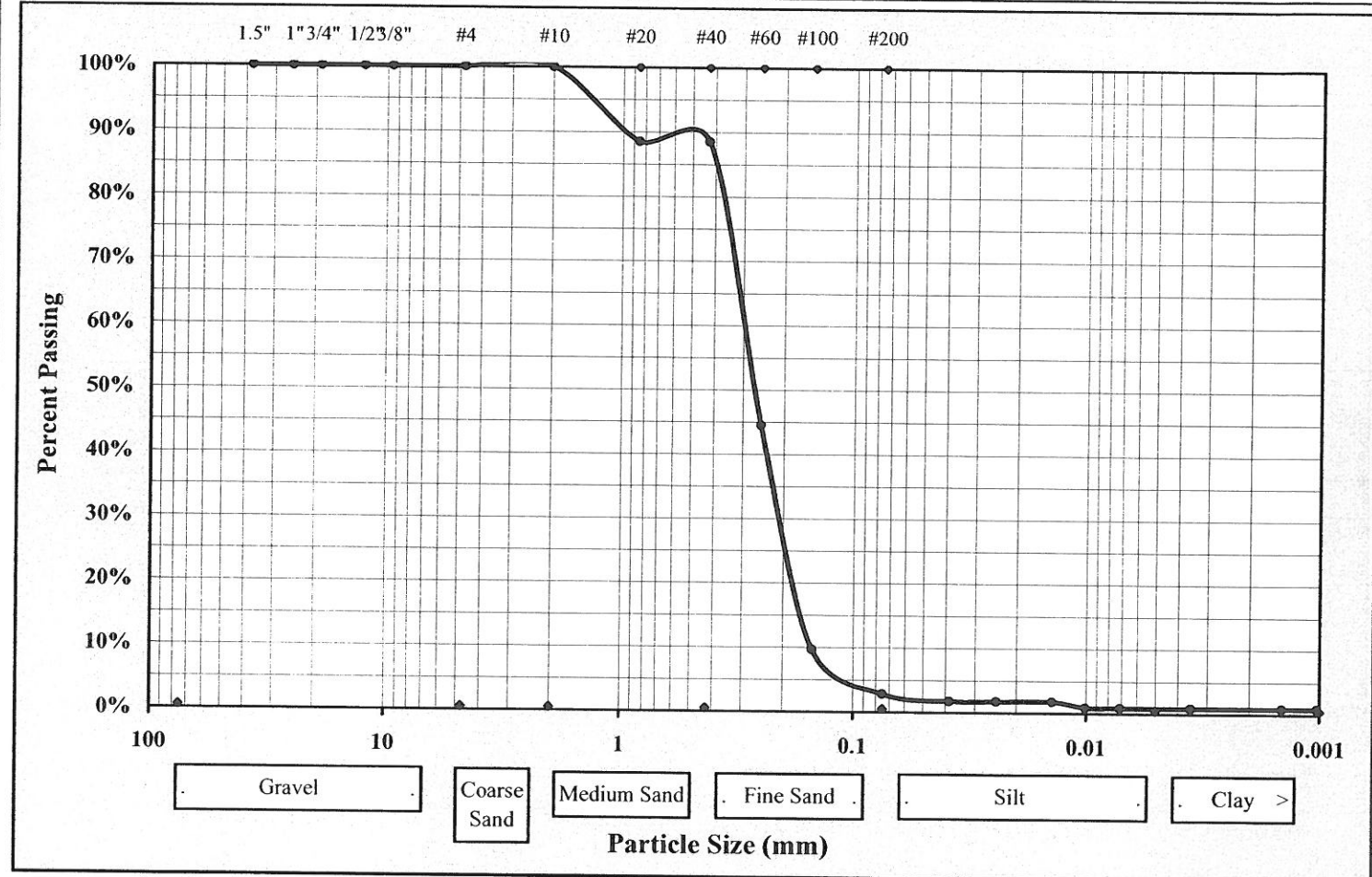
ASTM D 422



S&ME Project #: **1611-04-386**  
 Project Name: **RBO South Fork Edisto River & Cedar Creek**  
 Client Name: **SCDOT**  
 Client Address: **P.O. Box 191, Columbia, South Carolina, 29202-0191**

Report Date: **4/29/05**  
 Test Date(s): **4/13/05-4/28/05**

Boring #: **13** Sample #: **2** Sample Date: **Various**  
 Location: **B-13** Elevation: **18.0'-19.5'**  
 Sample Description: **Poorly Graded Sand (SP, A-1-b) low plasticity, fine sand, tan**



Moisture Content		Gravel	0.0%	Liquid Limit	
Silt & Clay (% Passing #200)	2.8%	Sand	97.2%	Plastic Limit	
Maximum Particle Size	0	Silt	1.8%	Plastic Index	
Specific Gravity	2.594	Clay	1.0%	Colloids	1.0%
Description of Sand & Gravel Particles:    Rounded <input checked="" type="checkbox"/> Angular <input checked="" type="checkbox"/> Hard & Durable <input checked="" type="checkbox"/> Soft <input type="checkbox"/> Weathered & Friable <input type="checkbox"/>					
ASTM D 422: Particle Size Analysis of Soils					
			Dispersing Agent:	Sodium Hexametaphosphate:	40 g./ Liter
			Mechanical Stirring Apparatus (A)	Length of Dispersion Period:	1 min.
<b>References:</b> ASTM D 854: Specific Gravity of Soils					
ASTM D 421: Dry Preparation of Soil Samples					
ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass					
ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils					
ASTM D 2487: Classification of Soils for Engineering Purposes (Unified Soil Classification System)					

Technical Responsibility / Position: Trapp Harris

Staff Professional



# **SPECIFIC GRAVITY OF SOILS** Test Method A

## **ASTM D-854**

PROJECT NO 1611-05-386 BORING NO B-13  
 PROJECT NAME RBO South Fork Edisto & Cedar Creek SAMPLE NO 2  
 DATE 4/21/2005 DEPTH 18.0'-19.5'  
 DESCRIPTION Poorly Graded Sand (SP, A-1-b) low plasticity, fine sand, tan  
 TESTED BY BU COMPUTED BY BU CHECKED BY BU

VOL FLASK NO <u>4</u>	VOL FLASK NO	VOL FLASK NO
1. WT. OF SOIL & VOL FLASK <u>85.94</u> g	1. WT. OF SOIL & VOL FLASK _____ g	1. WT. OF SOIL & VOL FLASK _____ g
2. Wt. of flask <u>65.84</u> g	2. Wt. of flask _____ g	2. Wt. of flask _____ g
A. WT. OF SOIL <u>20.1</u> g	A. WT. OF SOIL <u>0</u> g	A. WT. OF SOIL _____ g
B. WT. OF VOL. (from vol. Flask chart) FLASK & WATER <u>165.535</u> g	B. WT. OF VOL. (from vol. Flask chart) FLASK & WATER _____ g	B. WT. OF VOL. (from vol. Flask chart) FLASK & WATER _____ g
WATER TEM <u>28</u> °C	WATER TEMP. _____ °C	WATER TEMP. _____ °C
C. WT. OF VOL. FLASK, SOIL & WATER <u>177.9</u> g	C. WT. OF VOL. FLASK, SOIL & WATER _____ g	C. WT. OF VOL. FLASK, SOIL & WATER _____ g
D. SPECIFIC GRAVITY = $\frac{A}{A+(B-C)} = \frac{20.1}{20.1 + (165.535 - 177.9)} = 2.599$ g	D. SPECIFIC GRAVITY = $\frac{A}{A+(B-C)} = \frac{0}{0 + ( \quad - \quad )}$ g	D. SPECIFIC GRAVITY = $\frac{A}{A+(B-C)} = \frac{ \quad }{ \quad + ( \quad - \quad )}$ g

SPECIFIC GRAVITY (CORRECTED)  $G_s = D \cdot K =$

H <sub>2</sub> O TEMP. °C	CORRECTION FACTOR, K
18	1.0004
19	1.0002
20	1.0000
21	0.9998
22	0.9996
23	0.9993
24	0.9991
25	0.9989
26	0.9986
27	0.9983
28	0.9980
29	0.9977
30	0.9974

FLASK NO. 4  
 $G_s = D \cdot K = 2.594$

FLASK NO. 0  
 $G_s = D \cdot K =$

FLASK NO. 0  
 $G_s = D \cdot K =$

AVERAGE  
 $G_s =$  **2.594**

## Particle Size Analysis of Soils

ASTM D 422



Project #: 1611-04-386

Project Name: RBO South Fork Edisto River &amp; Cedar Creek

Client Name: SCDOT

Client Address: PO Box 191, Columbia, South Carolina, 29202-0191

Test Date(s): 4/13/05-4/28/05

Report Date: 5/1/05

Boring #: 13

Sample #: 2

Sample Date: Various

Location: B-13

Elevation: 18.0'-19.5'

Sample Description: Poorly Graded Sand (SP, A-1-b) low plasticity, fine sand, tan

Particle Size Analysis / Without Hydrometer Analysis			Moisture Content		Natural
				Tare #	12
	Tare Number	12.0	A	Tare Weight	0.00
A	Tare Weight	0.0	B	Wet Weight + Tare Wt.	30.94
B	Total Sample Dry Wt. + Tare Wt.	0.0	C	Dry Weight + Tare Wt.	26.68
C	Total Sample Dry Weight (B-A)	115.20	D	Water Wt. (B-C)	4.26
D	Total Sample Wt. After #200 Wash	111.70	E	Dry Wt.(C-A)	26.68
E	Percent Passing #200 (1-D/C)x100	3.0%	Moisture Content (100 x D/E) (%)		16.0%
Sieve Size (mm)	Sieve Size	Retained Weight	Percent Retained		Percent Passing Total Sample
37.50	1.5"	0.0	0.0%		100.0%
25.00	1.0"	0.00	0.0%		100.0%
19.00	3/4"	0.00	0.0%		100.0%
12.50	1/2"	0.00	0.0%		100.0%
9.50	3/8"	0.00	0.0%		100.0%
4.75	#4	0.00	0.0%		100.0%
2.36	#8	0.00	0.0%		100.0%
1.18	#16	0.50	0.4%		99.6%
0.60	#30	12.70	11.0%		88.5%
0.30	#50	50.60	43.9%		44.6%
0.15	#100	40.00	34.7%		9.9%
0.075	#200	7.90	6.9%		3.0%

<b>Notes:</b> Maximum Particle Size		Gravel	< 75 mm and > 4.75 mm (#4)	0.0%
Apparent Relative Density		Coarse Sand	< 4.75 mm and > 2.00 mm (#10)	0.0%
Liquid Limit	Fineness Modulus	Medium Sand	< 2.00 mm and > 0.425 mm (#40)	11.5%
Plastic Limit	Cu = D60/D10:	Fine Sand	< 0.425 mm and > 0.075 mm (#200)	85.5%
Plastic Index	Cc = (D30) <sup>2</sup> / (D10 x D60):	% Silt and Clay	< 0.075 mm	3.0%
		Description of Sand & Gravel	Rounded <input checked="" type="checkbox"/> Angular <input checked="" type="checkbox"/>	
		Hard & Durable <input checked="" type="checkbox"/> Soft <input type="checkbox"/> Weathered & Friable <input type="checkbox"/>		

Organic Content				
D10 =	D30 =	D60 =	D50 =	D90 =

ASTM D 422: Particle Size Analysis of Soils

Hydrometer portion of test method not utilized.

ASTM D 421: Dry Preparation of Soil Samples

ASTM D 854: Specific Gravity of Soils

ASTM D 4318: Liquid Limit, Plastic Limit, &amp; Plastic Index of Soils

ASTM D 2487: Classification of Soils for Engineering Purposes (Unified Soil Classification System)

Technician Name:

Brian Urban

Certification #

Technical Responsibility:

Trapp Harris

Signature

Staff Professional

Position



# Particle Size Analysis of Soils

ASTM D 422

Project #: 1611-04-386

Project Name: RBO South Fork Edisto River &amp; Cedar Creek

Client Name: SCDOT

Client Address: PO Box 191, Columbia, South Carolina, 29202-0191

Test Date(s): 4/13/05-4/28/05

Report Date: 5/1/05

Boring #: 13

Sample #: 8

Sample Date: Various

Location: B-13

Elevation: 48.0'-49.5'

Sample Description: Silty Sand (SM, A-7-6) medium plasticity, fine to medium sand, white, purple with yellow

Particle Size Analysis / Without Hydrometer Analysis			Moisture Content		Natural
				Tare #	303
	Tare Number	303.0	A	Tare Weight	0.00
A	Tare Weight	0.0	B	Wet Weight + Tare Wt.	133.38
B	Total Sample Dry Wt. + Tare Wt.	0.0	C	Dry Weight + Tare Wt.	112.61
C	Total Sample Dry Weight (B-A)	112.61	D	Water Wt. (B-C)	20.77
D	Total Sample Wt. After #200 Wash	66.70	E	Dry Wt.(C-A)	112.61
E	Percent Passing #200 (1-D/C)x100	40.8%	Moisture Content (100 x D/E) (%)		18.4%
Sieve Size (mm)	Sieve Size	Retained Weight	Percent Retained		Percent Passing Total Sample
37.50	1.5"	0.0	0.0%		100.0%
25.00	1.0"	0.00	0.0%		100.0%
19.00	3/4"	0.00	0.0%		100.0%
12.50	1/2"	0.00	0.0%		100.0%
9.50	3/8"	0.00	0.0%		100.0%
4.75	#4	0.00	0.0%		100.0%
2.36	#8	0.00	0.0%		100.0%
1.18	#16	0.08	0.1%		99.9%
0.60	#30	5.45	4.8%		95.1%
0.30	#50	28.79	25.6%		69.5%
0.15	#100	28.66	25.5%		44.1%
0.075	#200	3.72	3.3%		40.8%

<b>Notes:</b>		Maximum Particle Size	Gravel	< 75 mm and > 4.75 mm (#4)	0.0%
		Apparent Relative Density	Coarse Sand	< 4.75 mm and > 2.00 mm (#10)	0.0%
Liquid Limit	45	Fineness Modulus	Medium Sand	< 2.00 mm and > 0.425 mm (#40)	4.9%
Plastic Limit	27	Cu = D60/D10:	Fine Sand	< 0.425 mm and > 0.075 mm (#200)	54.3%
Plastic Index	18	Cc = (D30) <sup>2</sup> / (D10xD60):	% Silt and Clay	< 0.075 mm	40.8%
			Description of Sand & Gravel	Rounded <input checked="" type="checkbox"/> Angular <input checked="" type="checkbox"/>	
			Hard & Durable <input checked="" type="checkbox"/> Soft <input type="checkbox"/> Weathered & Friable <input type="checkbox"/>		

Organic Content

D10 =

D30 =

D60 =

D50 =

D90 =

ASTM D 422: Particle Size Analysis of Soils

Hydrometer portion of test method not utilized.

ASTM D 421: Dry Preparation of Soil Samples

ASTM D 854: Specific Gravity of Soils

ASTM D 4318: Liquid Limit, Plastic Limit, &amp; Plastic Index of Soils

ASTM D 2487: Classification of Soils for Engineering Purposes (Unified Soil Classification System)

Technician Name:

Brian Urban

Certification #

Technical Responsibility:

Trapp Harris

Signature

Staff Professional

Position



## Liquid Limit, Plastic Limit, and Plastic Index

Project #: **1611-04-386**  
 Project Name: **RBO South Fork Edisto River & Cedar Creek**  
 Client Name: **SCDOT**  
 Client Address: **P.O. Box 191, Columbia, South Carolina, 29202-0191**  
 Boring #: **13** Sample #: **8**  
 Location: **B-13**

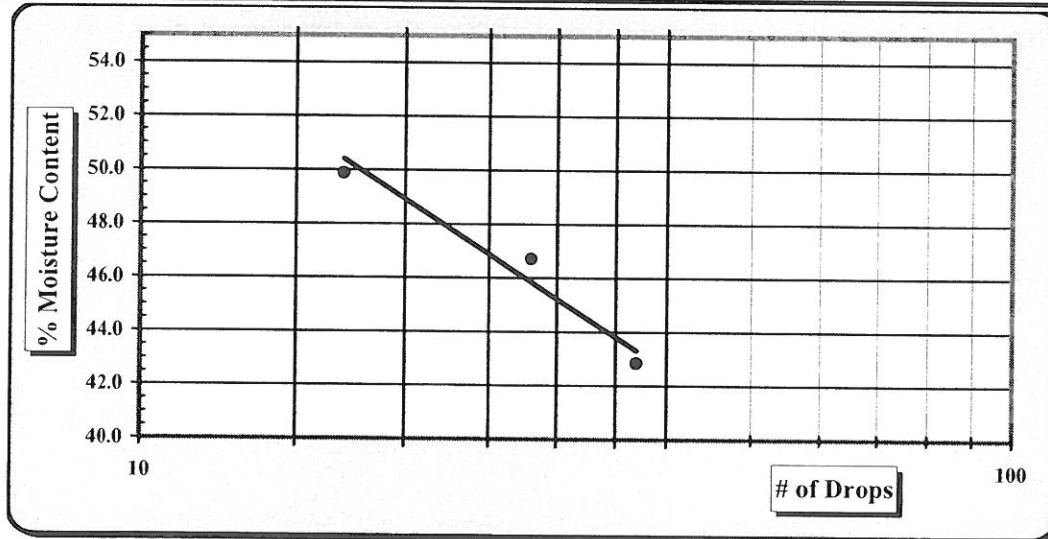
Report Date: **4/26/05**  
 Test Date(s): **4/16/05-4/28/05**

Sample Date: Various

Elevation: 48.0'-49.5'

Sample Description: **Silty Sand (SM, A-7-6) medium plasticity, fine to medium sand, white, purple with**

Pan #		Liquid Limit						Plastic Limit		
	Test #	1	2	3	4	5	6	1	2	3
	Tare #	29	j	y2				31	9	
A	Tare Weight	14.25	11.71	0.98				13.93	13.73	
B	Wet Soil Weight + A	25.58	21.95	11.55				19.68	20.19	
C	Dry Soil Weight + A	21.81	18.69	8.38				18.47	18.83	
D	Water Weight (B-C)	3.77	3.26	3.17				1.21	1.36	
E	Dry Soil Weight (C-A)	7.56	6.98	7.40				4.54	5.10	
F	% Moisture Content (D/E)*100	49.9%	46.7%	42.8%				26.7%	26.7%	
N	# OF DROPS	17	28	37				Moisture Contents determined by ASTM D 2216		
LL	LL = F * FACTOR									
Ave.	Average							26.7%		



One Point Liquid Limit

N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.990	29	1.018
24	0.995	30	1.022
25	1.000		

Notes:

Special Sampling Methods:

Sample Preparation:	Wet Preparation <input type="checkbox"/>	Dry Preparation <input checked="" type="checkbox"/>	Air Dried <input checked="" type="checkbox"/>	NP, Non-Plastic <input type="checkbox"/>
Liquid limit Test:	Multipoint Method <input checked="" type="checkbox"/>	One-point Method <input type="checkbox"/>		Liquid Limit <u>45</u>
Classification:	ASTM D 2487 <input type="checkbox"/>	AASHTO M 145 <input checked="" type="checkbox"/>		Plastic Limit <u>27</u>
Liquid limit Test:	ASTM D 4318 <input type="checkbox"/>	AASHTO T 89 <input checked="" type="checkbox"/>		Plastic Index <u>18</u>
Plastic limit Test:	ASTM D 4318 <input type="checkbox"/>	AASHTO T 90 <input checked="" type="checkbox"/>		Group Symbol <u>A-7-6</u>

Technician Name: Brian Urban

Certification #

Technical Responsibility: Trapp Harris

Signature

Staff Professional

Position



## Particle Size Analysis of Soils

ASTM D 422



Project #: 1611-04-386

Project Name: RBO South Fork Edisto River &amp; Cedar Creek

Client Name: SCDOT

Client Address: PO Box 191, Columbia, South Carolina, 29202-0191

Test Date(s): 4/13/05-4/28/05

Report Date: 5/1/05

Boring #: 14

Sample #: 2

Sample Date: Various

Location: B-14

Elevation: 19.1'-20.6'

Sample Description: Silty Sand (SM, A-2-4) low plasticity, fine to medium sand, dark brown

Particle Size Analysis / Without Hydrometer Analysis			Moisture Content		Natural
				Tare #	31
	Tare Number	31.0	A	Tare Weight	0.00
A	Tare Weight	0.0	B	Wet Weight + Tare Wt.	0.00
B	Total Sample Dry Wt. + Tare Wt.	0.0	C	Dry Weight + Tare Wt.	0.00
C	Total Sample Dry Weight (B-A)	56.40	D	Water Wt. (B-C)	0.00
D	Total Sample Wt. After #200 Wash	49.00	E	Dry Wt.(C-A)	0.00
E	Percent Passing #200 (1-D/C)x100	13.1%	Moisture Content (100 x D/E) (%)		#DIV/0!
Sieve Size (mm)	Sieve Size	Retained Weight	Percent Retained		Percent Passing Total Sample
37.50	1.5"	0.0	0.0%		100.0%
25.00	1.0"	0.00	0.0%		100.0%
19.00	3/4"	0.00	0.0%		100.0%
12.50	1/2"	0.00	0.0%		100.0%
9.50	3/8"	0.00	0.0%		100.0%
4.75	#4	1.50	2.7%		97.3%
2.36	#8	3.10	5.5%		91.8%
1.18	#16	5.60	9.9%		81.9%
0.60	#30	5.20	9.2%		72.7%
0.30	#50	4.60	8.2%		64.5%
0.15	#100	12.80	22.7%		41.8%
0.075	#200	16.20	28.7%		13.1%

<b>Notes:</b> Maximum Particle Size		Gravel	< 75 mm and > 4.75 mm (#4)	2.7%
Apparent Relative Density		Coarse Sand	< 4.75 mm and > 2.00 mm (#10)	5.5%
Liquid Limit	Fineness Modulus	Medium Sand	< 2.00 mm and > 0.425 mm (#40)	19.1%
Plastic Limit	Cu = D60/D10:	Fine Sand	< 0.425 mm and > 0.075 mm (#200)	59.6%
Plastic Index	Cc = (D30) <sup>2</sup> / (D10xD60):	% Silt and Clay	< 0.075 mm	13.1%
		Description of Sand & Gravel		
		Rounded <input checked="" type="checkbox"/>		Angular <input checked="" type="checkbox"/>
		Hard & Durable <input checked="" type="checkbox"/>	Soft <input type="checkbox"/>	Weathered & Friable <input type="checkbox"/>

Organic Content

D10 =

D30 =

D60 =

D50 =

D90 =

ASTM D 422: Particle Size Analysis of Soils

Hydrometer portion of test method not utilized.

ASTM D 421: Dry Preparation of Soil Samples

ASTM D 854: Specific Gravity of Soils

ASTM D 4318: Liquid Limit, Plastic Limit, &amp; Plastic Index of Soils

ASTM D 2487: Classification of Soils for Engineering Purposes (Unified Soil Classification System)

Technician Name:

Brian Urban

Certification #

Technical Responsibility:

Trapp Harris

Signature

Staff Professional

Position



## Particle Size Analysis of Soils

Laboratory Record Version 4.0

Report Date:

4/29/05

Project #: 1611-04-386

Test Date(s): 4/13/05-4/28/05

Liquid Limit: 40

Project Name: RBO South Fork Edisto River & Cedar Creek

Client Name: SCDOT

Plastic Limit: 21

Client Address: P.O. Box 191, Columbia, South Carolina, 29202-0191

Plastic Index: 19

Boring #: 14

Sample #: 3

Sample Date: Various

Location: B-14

Elevation: 24.1'-25.6'

Sample Description: Sandy Lean Clay (CL, A-G) low plasticity, fine to medium sand, white

Pan #:	13	Beaker #:	13	Specific Gravity:	2.591
Hydrometer Jar #:			8369	Pan # (washed sample):	
Pan Tare Weight (grams):			0.00	Moisture Content	Natural
Total Sample Wet Wt. + tare wt. (grams):			65.08	Tare #	1
Weight of Total Sample Air Dried:			65.08	Tare Wt.	11.54
Weight of Air Dried Hydrometer Sample (g):			65.08	Wet Wt. + A	33.88
Total Sample Oven Dried:			64.96	Dry Wt. + A	33.84
Hydrometer Sample Oven Dried (W):			64.96	Water Wt. (B-C)	0.04
% Passing #10:			100.0%	Dry Wt. (C-A)	22.30
Correction Factor a (Table 1):			1.02	% Moisture (100 x D/E)	0.18%

Notes:	Description of Sand & Gravel Particles:	Rounded <input checked="" type="checkbox"/>	Angular <input checked="" type="checkbox"/>	Hard & Durable <input checked="" type="checkbox"/>	Soft <input type="checkbox"/>	Weathered & Friable <input type="checkbox"/>
Maximum Particle Size:		Total Sand:	37.9%	< 4.74 mm and > 0.075 mm	Type:	Mechanical Stirring Apparatus (A)
% Gravel:	0.0%	Silt & Clay:	62.1%	< 0.075	Dispersion Time:	1 min.
Coarse Sand:	0.0%	Silt:	8.1%	< 0.075 and > 0.005 mm	Sodium Hexametaphosphate:	40 g./ Liter
Medium Sand:	13.4%	Clay:	54.0%	< 0.005 mm		
Fine Sand:	24.5%	Colloids:	37.0%	< 0.001 mm	Hydrometer:	151H <input type="checkbox"/> 152H <input checked="" type="checkbox"/>

Time	Temp. (°C)	Hydrometer Reading	Corrections		Hydrometer R	Percent Passing		Table 2 L	Table 3		Diameter D = $K \times ((L/T)^{1/2})$
			Control Cylinder	Composite Correction		P(-#10) = (R x a / W) x 100	P (total) = P x % Passing #10				
12:09	22.0	43.0	4.0	3.3	39.0	61.2%	61.2%	9.9	0.01374	0.03057	
12:12	22.0	42.0	4.0	3.3	38.0	59.7%	59.7%	10.1	0.01374	0.01953	
12:22	22.0	40.0	4.0	3.3	36.0	56.5%	56.5%	10.4	0.01374	0.01144	
12:37	21.8	40.0	4.0	3.5	36.0	56.5%	56.5%	10.4	0.01391	0.00819	
1:07	21.5	39.0	4.0	3.5	35.0	55.0%	55.0%	10.6	0.01391	0.00585	
4:17	20.7	36.0	4.0	3.8	32.0	50.2%	50.2%	11.1	0.01408	0.00297	
12:07	22.4	30.0	4.0	3.3	26.0	40.8%	40.8%	12.0	0.01374	0.00125	
12:07	22.2	27.0	4.0	3.3	23.0	36.1%	36.1%	12.5	0.01374	0.00091	

Technician Name / Certification #		References:	
Brian Urban		ASTM D 421: Dry Preparation of Soil Samples	
		ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass	
		ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils	
		ASTM D 2487: Classification of Soils for Engineering Purposes (Unified Soil Classification System)	

Technical Responsibility: Trapp Harris

Position: Staff Professional

# Particle Size Analysis of Soils

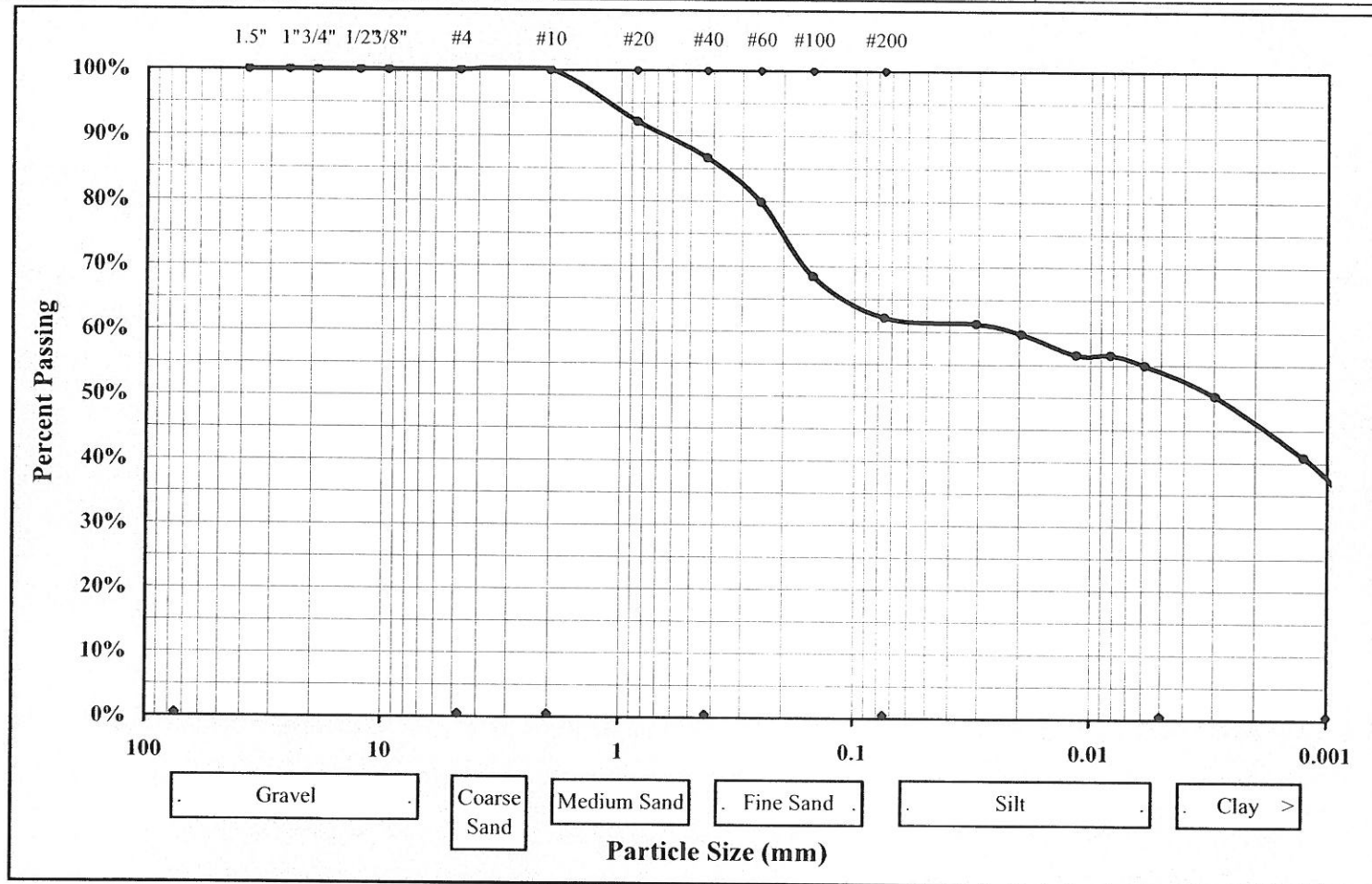
ASTM D 422



S&ME Project #: **1611-04-386**  
 Project Name: **RBO South Fork Edisto River & Cedar Creek**  
 Client Name: **SCDOT**  
 Client Address: **P.O. Box 191, Columbia, South Carolina, 29202-0191**

Report Date: **4/29/05**  
 Test Date(s): **4/13/05-4/28/05**

Boring #: **14** Sample #: **3** Sample Date: **Various**  
 Location: **B-14** Elevation: **24.1'-25.6'**  
 Sample Description: **Sandy Lean Clay (CL, A-6) low plasticity, fine to medium sand, white**



Moisture Content		Gravel	0.0%	Liquid Limit	40
Silt & Clay (% Passing #200)	62.1%	Sand	37.9%	Plastic Limit	21
Maximum Particle Size	0	Silt	8.1%	Plastic Index	19
Specific Gravity	2.591	Clay	54.0%	Colloids	37.0%

Description of Sand & Gravel Particles: Rounded ☒ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐  
 ASTM D 422: Particle Size Analysis of Soils  
 Dispersing Agent: Sodium Hexametaphosphate: 40 g./ Liter  
 Mechanical Stirring Apparatus (A) Length of Dispersion Period: 1 min.

References: ASTM D 854: Specific Gravity of Soils  
 ASTM D 421: Dry Preparation of Soil Samples  
 ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass  
 ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils  
 ASTM D 2487: Classification of Soils for Engineering Purposes (Unified Soil Classification System)

Technical Responsibility / Position: **Trapp Harris**

Staff Professional



# SPECIFIC GRAVITY OF SOILS

Test Method A

## ASTM D-854

PROJECT NO 1611-05-386 BORING NO B-14  
 PROJECT NAME RBO South Fork Edisto & Cedar Creek SAMPLE NO 3  
 DATE 4/21/2005 DEPTH 24.1'-25.6'  
 DESCRIPTION Sandy Lean Clay (CL, A-6) medium plasticity, fine sand, white  
 TESTED BY BU COMPUTED BY BU CHECKED BY BU

VOL FLASK NO <u>2</u>	VOL FLASK NO _____	VOL FLASK NO _____
1. WT. OF SOIL & VOL FLASK <u>85.41</u> g	1. WT. OF SOIL & VOL FLASK _____ g	1. WT. OF SOIL & VOL FLASK _____ g
2. Wt. of flask <u>64.53</u> g	2. Wt. of flask _____ g	2. Wt. of flask _____ g
A. WT. OF SOIL <u>20.88</u> g	A. WT. OF SOIL <u>0</u> g	A. WT. OF SOIL _____ g
B. WT. OF VOL. (from vol. Flask chart) FLASK & WATER <u>164.156</u> g	B. WT. OF VOL. (from vol. Flask chart) FLASK & WATER _____ g	B. WT. OF VOL. (from vol. Flask chart) FLASK & WATER _____ g
WATER TEM <u>27</u> °C	WATER TEMP. _____ °C	WATER TEMP. _____ °C
C. WT. OF VOL. FLASK, SOIL & WATER <u>176.99</u> g	C. WT. OF VOL. FLASK, SOIL & WATER _____ g	C. WT. OF VOL. FLASK, SOIL & WATER _____ g
D. SPECIFIC GRAVITY = $\frac{A}{A+(B-C)} = \frac{20.88}{20.88 + (164.156 - 176.99)} = 2.595$ g	D. SPECIFIC GRAVITY = $\frac{A}{A+(B-C)} = \frac{0}{0 + (_____ - _____)} = _____$ g	D. SPECIFIC GRAVITY = $\frac{A}{A+(B-C)} = \frac{_____}{_____ + (_____ - _____)} = _____$ g

SPECIFIC GRAVITY (CORRECTED)  $G_s = D \cdot K =$

H <sub>2</sub> O TEMP. °C	CORRECTION FACTOR, K
18	1.0004
19	1.0002
20	1.0000
21	0.9998
22	0.9996
23	0.9993
24	0.9991
25	0.9989
26	0.9986
27	0.9983
28	0.9980
29	0.9977
30	0.9974

FLASK NO. 2  
 $G_s = D \cdot K = 2.591$

FLASK NO. 0  
 $G_s = D \cdot K =$

FLASK NO. 0  
 $G_s = D \cdot K =$

AVERAGE  
 $G_s =$  **2.591**





# Particle Size Analysis of Soils

ASTM D 422

Project #: 1611-04-386

Project Name: RBO South Fork Edisto River &amp; Cedar Creek

Client Name: SCDOT

Client Address: PO Box 191, Columbia, South Carolina, 29202-0191

Test Date(s): 4/13/05-4/28/05

Report Date: 5/1/05

Boring #: 14

Sample #: 3

Sample Date:

Various

Location: B-14

Elevation:

24.1'-25.6'

Sample Description: Sandy Lean Clay (CL, A-6) medium plasticity, fine to medium sand, white

Particle Size Analysis / Without Hydrometer Analysis			Moisture Content		Natural
				Tare #	13
	Tare Number	13.0	A	Tare Weight	0.00
A	Tare Weight	0.0	B	Wet Weight + Tare Wt.	25.83
B	Total Sample Dry Wt. + Tare Wt.	0.0	C	Dry Weight + Tare Wt.	21.80
C	Total Sample Dry Weight (B-A)	65.08	D	Water Wt. (B-C)	4.03
D	Total Sample Wt. After #200 Wash	24.60	E	Dry Wt.(C-A)	21.80
E	Percent Passing #200 (1-D/C)x100	62.2%	Moisture Content (100 x D/E) (%)		18.5%
Sieve Size (mm)	Sieve Size	Retained Weight	Percent Retained		Percent Passing Total Sample
37.50	1.5"	0.0	0.0%		100.0%
25.00	1.0"	0.00	0.0%		100.0%
19.00	3/4"	0.00	0.0%		100.0%
12.50	1/2"	0.00	0.0%		100.0%
9.50	3/8"	0.00	0.0%		100.0%
4.75	#4	0.00	0.0%		100.0%
2.36	#8	0.00	0.0%		100.0%
1.18	#16	0.90	1.4%		98.6%
0.60	#30	4.20	6.5%		92.2%
0.30	#50	8.00	12.3%		79.9%
0.15	#100	7.40	11.4%		68.5%
0.075	#200	4.10	6.3%		62.2%

<b>Notes:</b>		Maximum Particle Size	Gravel	< 75 mm and > 4.75 mm (#4)	0.0%
		Apparent Relative Density	Coarse Sand	< 4.75 mm and > 2.00 mm (#10)	0.0%
Liquid Limit	40	Fineness Modulus	Medium Sand	< 2.00 mm and > 0.425 mm (#40)	7.8%
Plastic Limit	21	Cu = D60/D10:	Fine Sand	< 0.425 mm and > 0.075 mm (#200)	30.0%
Plastic Index	19	Cc = (D30) <sup>2</sup> / (D10xD60):	% Silt and Clay	< 0.075 mm	62.2%
			Description of Sand & Gravel	Rounded <input checked="" type="checkbox"/> Angular <input checked="" type="checkbox"/>	
			Hard & Durable <input checked="" type="checkbox"/> Soft <input type="checkbox"/> Weathered & Friable <input type="checkbox"/>		

Organic Content				
D10 =	D30 =	D60 =	D50 =	D90 =

ASTM D 422: Particle Size Analysis of Soils

Hydrometer portion of test method not utilized.

ASTM D 421: Dry Preparation of Soil Samples

ASTM D 854: Specific Gravity of Soils

ASTM D 4318: Liquid Limit, Plastic Limit, &amp; Plastic Index of Soils

ASTM D 2487: Classification of Soils for Engineering Purposes (Unified Soil Classification System)

Technician Name:

Brian Urban

Certification #

Technical Responsibility:

Trapp Harris

Signature

Staff Professional

Position





## Liquid Limit, Plastic Limit, and Plastic Index

Project #: **1611-04-386**  
 Project Name: RBO South Fork Edisto River & Cedar Creek  
 Client Name: SCDOT  
 Client Address: P.O. Box 191, Columbia, South Carolina, 29202-0191

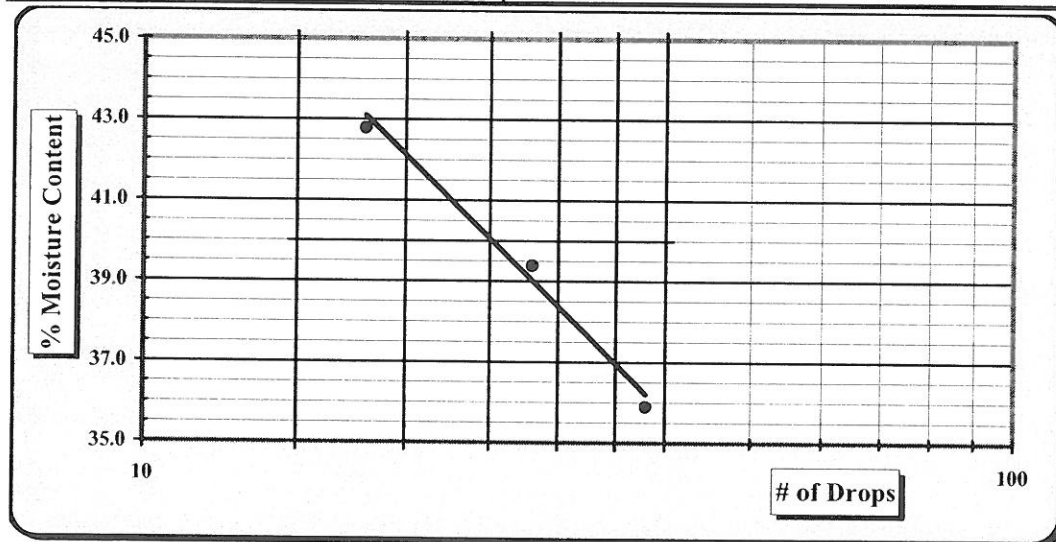
Report Date: 4/26/05  
 Test Date(s): 4/16/05-4/28/05

Boring #: 14 Sample #: 3 Sample Date: Various

Location: B-14 Elevation: 24.1'-25.6'

Sample Description: Sandy Lean Clay (CL, A-6) medium plasticity, fine to medium sand, white

Pan #		Liquid Limit						Plastic Limit		
	Test #	1	2	3	4	5	6	1	2	3
	Tare #	128	100	141				137	123	
A	Tare Weight	13.70	13.82	13.55				13.74	13.72	
B	Wet Soil Weight + A	24.68	24.72	24.53				18.99	19.31	
C	Dry Soil Weight + A	21.39	21.64	21.63				18.06	18.33	
D	Water Weight (B-C)	3.29	3.08	2.90				0.93	0.98	
E	Dry Soil Weight (C-A)	7.69	7.82	8.08				4.32	4.61	
F	% Moisture Content (D/E)*100	42.8%	39.4%	35.9%				21.5%	21.3%	
N	# OF DROPS	18	28	38				Moisture Contents determined by ASTM D 2216		
LL	LL = F * FACTOR									
Ave.	Average							21.4%		



One Point Liquid Limit

N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.990	29	1.018
24	0.995	30	1.022
25	1.000		

Notes:

Special Sampling Methods:

Sample Preparation:	Wet Preparation <input type="checkbox"/>	Dry Preparation <input checked="" type="checkbox"/>	Air Dried <input checked="" type="checkbox"/>	NP, Non-Plastic <input type="checkbox"/>
Liquid limit Test:	Multipoint Method <input checked="" type="checkbox"/>	One-point Method <input type="checkbox"/>		Liquid Limit 40
Classification:	ASTM D 2487 <input type="checkbox"/>	AASHTO M 145 <input checked="" type="checkbox"/>		Plastic Limit 21
Liquid limit Test:	ASTM D 4318 <input type="checkbox"/>	AASHTO T 89 <input checked="" type="checkbox"/>		Plastic Index 19
Plastic limit Test:	ASTM D 4318 <input type="checkbox"/>	AASHTO T 90 <input checked="" type="checkbox"/>		Group Symbol A-7-6

Technician Name: Brian Urban

Certification #

Technical Responsibility: Trapp Harris

Signature

Staff Professional

Position

## Particle Size Analysis of Soils

ASTM D 422



Project #: 1611-04-386

Project Name: RBO South Fork Edisto River &amp; Cedar Creek

Client Name: SCDOT

Client Address: PO Box 191, Columbia, SC 29202-0191

Test Date(s): 4/13/05-4/28/05

Report Date: 5/1/05

Boring #: 14

Sample #: 5

Sample Date: Various

Location: B-14

Elevation: 34.9'-36.4'

Sample Description: Fat Clay (CH, A-7-6) medium plasticity, fine sand, white with red

Particle Size Analysis / Without Hydrometer Analysis			Moisture Content		Natural
				Tare #	405
	Tare Number	405.0	A	Tare Weight	0.00
A	Tare Weight	0.0	B	Wet Weight + Tare Wt.	110.86
B	Total Sample Dry Wt. + Tare Wt.	0.0	C	Dry Weight + Tare Wt.	90.06
C	Total Sample Dry Weight (B-A)	90.06	D	Water Wt. (B-C)	20.80
D	Total Sample Wt. After #200 Wash	7.20	E	Dry Wt.(C-A)	90.06
E	Percent Passing #200 (1-D/C)x100	92.0%	Moisture Content (100 x D/E) (%)		23.1%
Sieve Size (mm)	Sieve Size	Retained Weight	Percent Retained		Percent Passing Total Sample
37.50	1.5"	0.0	0.0%		100.0%
25.00	1.0"	0.00	0.0%		100.0%
19.00	3/4"	0.00	0.0%		100.0%
12.50	1/2"	0.00	0.0%		100.0%
9.50	3/8"	0.00	0.0%		100.0%
4.75	#4	0.00	0.0%		100.0%
2.36	#8	0.00	0.0%		100.0%
1.18	#16	0.20	0.2%		99.8%
0.60	#30	0.50	0.6%		99.2%
0.30	#50	0.70	0.8%		98.4%
0.15	#100	2.40	2.7%		95.8%
0.075	#200	3.40	3.8%		92.0%

<b>Notes:</b> Maximum Particle Size		Gravel	< 75 mm and > 4.75 mm (#4)	0.0%
Apparent Relative Density		Coarse Sand	< 4.75 mm and > 2.00 mm (#10)	0.0%
Liquid Limit	62	Medium Sand	< 2.00 mm and > 0.425 mm (#40)	0.8%
Plastic Limit	21	Fine Sand	< 0.425 mm and > 0.075 mm (#200)	7.2%
Plastic Index	41	% Silt and Clay	< 0.075 mm	92.0%
		Description of Sand & Gravel	Rounded <input checked="" type="checkbox"/> Angular <input checked="" type="checkbox"/>	
		Hard & Durable <input checked="" type="checkbox"/> Soft <input type="checkbox"/> Weathered & Friable <input type="checkbox"/>		

Organic Content				
D10 =	D30 =	D60 =	D50 =	D90 =

ASTM D 422: Particle Size Analysis of Soils

Hydrometer portion of test method not utilized.

ASTM D 421: Dry Preparation of Soil Samples

ASTM D 854: Specific Gravity of Soils

ASTM D 4318: Liquid Limit, Plastic Limit, &amp; Plastic Index of Soils

ASTM D 2487: Classification of Soils for Engineering Purposes (Unified Soil Classification System)

Technician Name:

Brian Urban

Certification #

Technical Responsibility:

Trapp Harris

Signature

Staff Professional

Position



## Liquid Limit, Plastic Limit, and Plastic Index

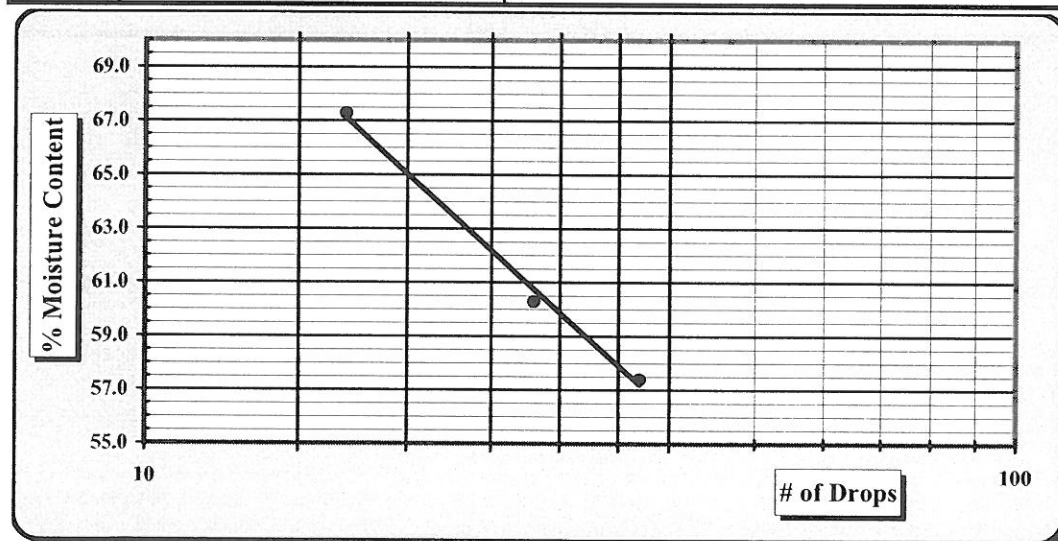
Project #: **1611-04-386**  
 Project Name: RBO South Fork Edisto River & Cedar Creek  
 Client Name: SCDOT  
 Client Address: P.O. Box 191, Columbia, South Carolina, 29202-0191

Report Date: 4/26/05  
 Test Date(s): 4/16/05-4/28/05

Boring #: 14 Sample #: 5 Sample Date: Various  
 Location: B-14 Elevation: 34.9'-36.4'

Sample Description: Fat Clay (CH, A-7-6) medium plasticity, fine sand, white with red

Pan #		Liquid Limit						Plastic Limit		
	Test #	1	2	3	4	5	6	1	2	3
	Tare #	101	133	146				137	123	
A	Tare Weight	13.67	13.77	13.51				13.74	13.72	
B	Wet Soil Weight + A	24.66	24.06	22.89				18.99	19.31	
C	Dry Soil Weight + A	20.24	20.19	19.47				18.06	18.33	
D	Water Weight (B-C)	4.42	3.87	3.42				0.93	0.98	
E	Dry Soil Weight (C-A)	6.57	6.42	5.96				4.32	4.61	
F	% Moisture Content (D/E)*100	67.3%	60.3%	57.4%				21.5%	21.3%	
N	# OF DROPS	17	28	37				Moisture Contents determined by ASTM D 2216		
LL	LL = F * FACTOR									
Ave.	Average							21.4%		



One Point Liquid Limit			
N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.990	29	1.018
24	0.995	30	1.022
25	1.000		

Notes:

### Special Sampling Methods:

Sample Preparation:	Wet Preparation <input type="checkbox"/>	Dry Preparation <input checked="" type="checkbox"/>	Air Dried <input checked="" type="checkbox"/>	NP, Non-Plastic <input type="checkbox"/>
Liquid limit Test:	Multipoint Method <input checked="" type="checkbox"/>	One-point Method <input type="checkbox"/>		Liquid Limit 62
Classification:	ASTM D 2487 <input type="checkbox"/>	AASHTO M 145 <input checked="" type="checkbox"/>		Plastic Limit 21
Liquid limit Test:	ASTM D 4318 <input type="checkbox"/>	AASHTO T 89 <input checked="" type="checkbox"/>		Plastic Index 41
Plastic limit Test:	ASTM D 4318 <input type="checkbox"/>	AASHTO T 90 <input checked="" type="checkbox"/>		Group Symbol A-7-6

Technician Name: Brian Urban

Certification #

Technical Responsibility: Trapp Harris

Signature

Staff Professional

Position

## Particle Size Analysis of Soils

ASTM D 422



Project #: 1611-04-386

Project Name: RBO South Fork Edisto River &amp; Cedar Creek

Client Name: SCDOT

Client Address: PO Box 191, Columbia, SC 29202-0191

Test Date(s): 4/13/05-4/28/05

Report Date:

Boring #: 15

Sample #: 3

Sample Date:

Various

Location: B-15

Elevation:

23.6'-25.1'

Sample Description: Sandy Lean Clay (CL, A-6) low plasticity, fine to medium sand, white

Particle Size Analysis / Without Hydrometer Analysis			Moisture Content		Natural
				Tare #	313
	Tare Number	313.0	A	Tare Weight	0.00
A	Tare Weight	0.0	B	Wet Weight + Tare Wt.	120.41
B	Total Sample Dry Wt. + Tare Wt.	0.0	C	Dry Weight + Tare Wt.	103.02
C	Total Sample Dry Weight (B-A)	103.02	D	Water Wt. (B-C)	17.39
D	Total Sample Wt. After #200 Wash	44.00	E	Dry Wt.(C-A)	103.02
E	Percent Passing #200 (1-D/C)x100	57.3%	Moisture Content (100 x D/E) (%)		16.9%
Sieve Size (mm)	Sieve Size	Retained Weight	Percent Retained		Percent Passing Total Sample
37.50	1.5"	0.0	0.0%		100.0%
25.00	1.0"	0.00	0.0%		100.0%
19.00	3/4"	0.00	0.0%		100.0%
12.50	1/2"	0.00	0.0%		100.0%
9.50	3/8"	0.00	0.0%		100.0%
4.75	#4	0.00	0.0%		100.0%
2.36	#8	0.10	0.1%		99.9%
1.18	#16	2.30	2.2%		97.7%
0.60	#30	8.10	7.9%		89.8%
0.30	#50	14.70	14.3%		75.5%
0.15	#100	12.20	11.8%		63.7%
0.075	#200	6.60	6.4%		57.3%

<b>Notes:</b>		Maximum Particle Size	Gravel	< 75 mm and > 4.75 mm (#4)	0.0%
		Apparent Relative Density	Coarse Sand	< 4.75 mm and > 2.00 mm (#10)	0.1%
Liquid Limit	38	Fineness Modulus	Medium Sand	< 2.00 mm and > 0.425 mm (#40)	10.1%
Plastic Limit	18	Cu = D60/D10:	Fine Sand	< 0.425 mm and > 0.075 mm (#200)	32.5%
Plastic Index	20	Cc = (D30) <sup>2</sup> / (D10xD60):	% Silt and Clay	< 0.075 mm	57.3%
			Description of Sand & Gravel	Rounded <input type="checkbox"/>	Angular <input type="checkbox"/>
			Hard & Durable <input type="checkbox"/>	Soft <input type="checkbox"/>	Weathered & Friable <input type="checkbox"/>

Organic Content

D10 =

D30 =

D60 =

D50 =

D90 =

ASTM D 422: Particle Size Analysis of Soils

Hydrometer portion of test method not utilized.

ASTM D 421: Dry Preparation of Soil Samples

ASTM D 854: Specific Gravity of Soils

ASTM D 4318: Liquid Limit, Plastic Limit, &amp; Plastic Index of Soils

ASTM D 2487: Classification of Soils for Engineering Purposes (Unified Soil Classification System)

Technician Name:

Brian Urban

Certification #

Technical Responsibility:

Trapp Harris

Signature

Staff Professional

Position





## Liquid Limit, Plastic Limit, and Plastic Index

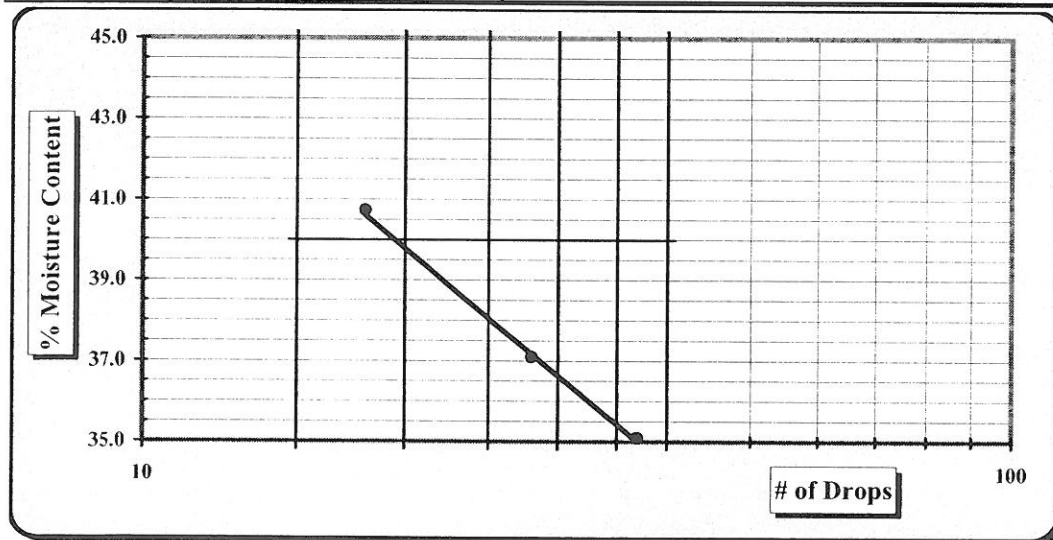
Project #: **1611-04-386**  
 Project Name: **RBO South Fork Edisto River & Cedar Creek**  
 Client Name: **SCDOT**  
 Client Address: **P.O. Box 191, Columbia, South Carolina, 29202-0191**  
 Boring #: **15** Sample #: **3**

Report Date: **4/27/05**  
 Test Date(s): **4/16/05-4/28/05**

Location: **B-15** Elevation: **23.6'-25.1'**

Sample Description: **Sandy Lean Clay (CL, A-6) low plasticity, fine to medium sand, white**

Pan #		Liquid Limit						Plastic Limit		
	Test #	1	2	3	4	5	6	1	2	3
	Tare #	111	141	134				143	108	
A	Tare Weight	13.59	13.56	13.73				13.72	13.39	
B	Wet Soil Weight + A	23.61	22.80	24.74				19.28	18.85	
C	Dry Soil Weight + A	20.71	20.30	21.88				18.42	18.00	
D	Water Weight (B-C)	2.90	2.50	2.86				0.86	0.85	
E	Dry Soil Weight (C-A)	7.12	6.74	8.15				4.70	4.61	
F	% Moisture Content (D/E)*100	40.7%	37.1%	35.1%				18.3%	18.4%	
N	# OF DROPS	18	28	37				Moisture Contents determined by ASTM D 2216		
LL	LL = F * FACTOR									
Ave.	Average							18.4%		



One Point Liquid Limit			
N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.990	29	1.018
24	0.995	30	1.022
25	1.000		

Notes:

### Special Sampling Methods:

Sample Preparation:	Wet Preparation <input type="checkbox"/>	Dry Preparation <input checked="" type="checkbox"/>	Air Dried <input checked="" type="checkbox"/>	NP, Non-Plastic <input type="checkbox"/>
Liquid limit Test:	Multipoint Method <input checked="" type="checkbox"/>	One-point Method <input type="checkbox"/>		Liquid Limit <u>38</u>
Classification:	ASTM D 2487 <input type="checkbox"/>	AASHTO M 145 <input checked="" type="checkbox"/>		Plastic Limit <u>18</u>
Liquid limit Test:	ASTM D 4318 <input type="checkbox"/>	AASHTO T 89 <input checked="" type="checkbox"/>		Plastic Index <u>20</u>
Plastic limit Test:	ASTM D 4318 <input type="checkbox"/>	AASHTO T 90 <input checked="" type="checkbox"/>		Group Symbol <u>A-6</u>

Technician Name: Brian Urban

Certification #

Technical Responsibility: Trapp Harris

Signature

Staff Professional

Position



## Particle Size Analysis of Soils

ASTM D 422



Project #: 1611-04-386

Project Name: RBO South Fork Edisto River &amp; Cedar Creek

Client Name: SCDOT

Client Address: PO Box 191, Columbia, SC 29202-0191

Test Date(s): 4-13-05/4/28/05

Report Date:

Boring #: 16

Sample #: 1

Sample Date: Various

Location: B-16

Elevation: 14.8-16.3

Sample Description: Silty Sand (SM, A-2-4) low plasticity, fine to medium sand, light brown

Particle Size Analysis / Without Hydrometer Analysis			Moisture Content		Natural
				Tare #	303
	Tare Number	303.0	A	Tare Weight	0.00
A	Tare Weight	0.0	B	Wet Weight + Tare Wt.	181.36
B	Total Sample Dry Wt. + Tare Wt.	0.0	C	Dry Weight + Tare Wt.	138.23
C	Total Sample Dry Weight (B-A)	138.23	D	Water Wt. (B-C)	43.13
D	Total Sample Wt. After #200 Wash	110.30	E	Dry Wt.(C-A)	138.23
E	Percent Passing #200 (1-D/C)x100	20.2%	Moisture Content (100 x D/E) (%)		31.2%
Sieve Size (mm)	Sieve Size	Retained Weight	Percent Retained		Percent Passing Total Sample
37.50	1.5"	0.0	0.0%		100.0%
25.00	1.0"	0.00	0.0%		100.0%
19.00	3/4"	0.00	0.0%		100.0%
12.50	1/2"	0.00	0.0%		100.0%
9.50	3/8"	0.00	0.0%		100.0%
4.75	#4	0.00	0.0%		100.0%
2.36	#8	0.70	0.5%		99.5%
1.18	#16	1.90	1.4%		98.1%
0.60	#30	5.90	4.3%		93.9%
0.30	#50	12.10	8.8%		85.1%
0.15	#100	39.40	28.5%		56.6%
0.075	#200	50.30	36.4%		20.2%

<b>Notes:</b>		Maximum Particle Size	Gravel	< 75 mm and > 4.75 mm (#4)	0.0%
		Apparent Relative Density	Coarse Sand	< 4.75 mm and > 2.00 mm (#10)	0.5%
Liquid Limit	24	Fineness Modulus	Medium Sand	< 2.00 mm and > 0.425 mm (#40)	5.6%
Plastic Limit	21	Cu = D60/D10:	Fine Sand	< 0.425 mm and > 0.075 mm (#200)	73.6%
Plastic Index	3	Cc = (D30) <sup>2</sup> / (D10xD60):	% Silt and Clay	< 0.075 mm	20.2%
			Description of Sand & Gravel	Rounded <input type="checkbox"/>	Angular <input type="checkbox"/>
			Hard & Durable <input type="checkbox"/>	Soft <input type="checkbox"/>	Weathered & Friable <input type="checkbox"/>

Organic Content					
D10 =	D30 =	D60 =	D50 =	D90 =	

ASTM D 422: Particle Size Analysis of Soils

Hydrometer portion of test method not utilized.

ASTM D 421: Dry Preparation of Soil Samples

ASTM D 854: Specific Gravity of Soils

ASTM D 4318: Liquid Limit, Plastic Limit, &amp; Plastic Index of Soils

ASTM D 2487: Classification of Soils for Engineering Purposes (Unified Soil Classification System)

Technician Name:

Brian Urban

Certification #

Technical Responsibility:

Trapp Harris

Signature

Staff Professional

Position



## Liquid Limit, Plastic Limit, and Plastic Index

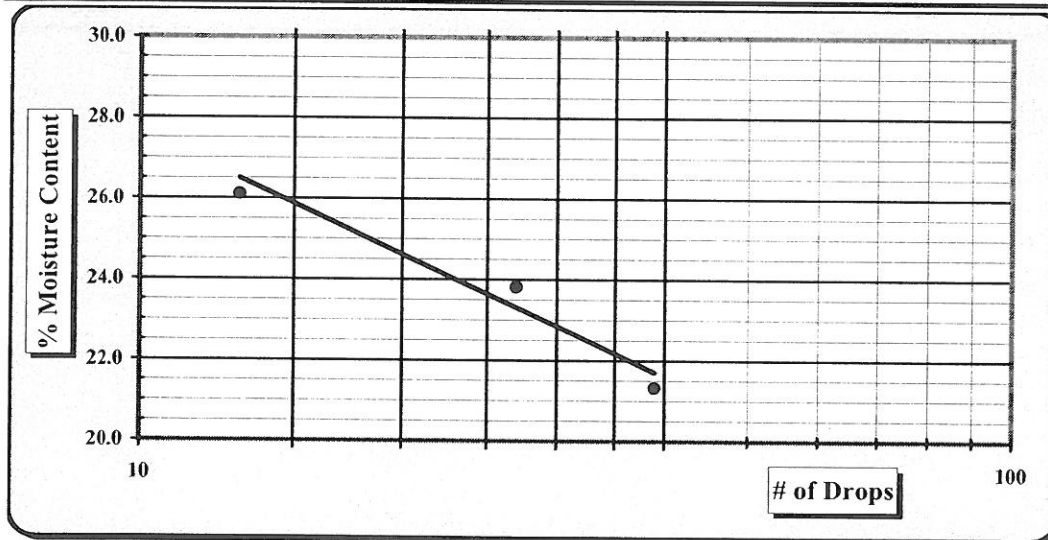
Project #: **1611-04-386**  
 Project Name: RBO South Fork Edisto River & Cedar Creek  
 Client Name: SCDOT  
 Client Address: P.O. Box 191, Columbia, South Carolina, 29202-0191  
 Boring #: 16 Sample #: 1

Report Date: 4/26/05  
 Test Date(s): 4/16/05-4/28/05

Location: B-16 Elevation: 14.8'-16.3'

Sample Description: Silty Sand (SM, A-2-4) low plasticity, fine to medium sand, light brown

Pan #		Liquid Limit						Plastic Limit		
	Test #	1	2	3	4	5	6	1	2	3
	Tare #	113	145	115				139	117	
A	Tare Weight	13.59	13.62	13.80				13.71	13.78	
B	Wet Soil Weight + A	24.17	23.24	23.36				19.29	19.35	
C	Dry Soil Weight + A	21.98	21.39	21.68				18.32	18.37	
D	Water Weight (B-C)	2.19	1.85	1.68				0.97	0.98	
E	Dry Soil Weight (C-A)	8.39	7.77	7.88				4.61	4.59	
F	% Moisture Content (D/E)*100	26.1%	23.8%	21.3%				21.0%	21.4%	
N	# OF DROPS	13	27	39				Moisture Contents determined by ASTM D 2216		
LL	LL = F * FACTOR									
Ave.	Average							21.2%		



One Point Liquid Limit			
N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.990	29	1.018
24	0.995	30	1.022
25	1.000		

Notes:

### Special Sampling Methods:

Sample Preparation:	Wet Preparation <input type="checkbox"/>	Dry Preparation <input checked="" type="checkbox"/>	Air Dried <input checked="" type="checkbox"/>	NP, Non-Plastic <input type="checkbox"/>
Liquid limit Test:	Multipoint Method <input checked="" type="checkbox"/>	One-point Method <input type="checkbox"/>		Liquid Limit <u>24</u>
Classification:	ASTM D 2487 <input type="checkbox"/>	AASHTO M 145 <input checked="" type="checkbox"/>		Plastic Limit <u>21</u>
Liquid limit Test:	ASTM D 4318 <input type="checkbox"/>	AASHTO T 89 <input checked="" type="checkbox"/>		Plastic Index <u>3</u>
Plastic limit Test:	ASTM D 4318 <input type="checkbox"/>	AASHTO T 90 <input checked="" type="checkbox"/>		Group Symbol <u>A-2-4</u>

Technician Name: Brian Urban

Certification #

Technical Responsibility: Trapp Harris

Signature

Staff Professional

Position



# Particle Size Analysis of Soils

ASTM D 422

Project #: 1611-04-386

Project Name: RBO South Fork Edisto River &amp; Cedar Creek

Client Name: SCDOT

Client Address: PO Box 191, Columbia, SC 29202-0191

Test Date(s): 4/13/05-4/28/05

Report Date: 5/1/05

Boring #: 16

Sample #: 11

Sample Date: Various

Location: B-16

Elevation: 64.5'-66.0'

Sample Description: Silty Sand (SM, A-2-4) low plasticity, fine to medium sand, white and purple

Particle Size Analysis / Without Hydrometer Analysis			Moisture Content		Natural
				Tare #	0
	Tare Number	0.0	A	Tare Weight	0.00
A	Tare Weight	0.0	B	Wet Weight + Tare Wt.	196.43
B	Total Sample Dry Wt. + Tare Wt.	0.0	C	Dry Weight + Tare Wt.	170.02
C	Total Sample Dry Weight (B-A)	170.02	D	Water Wt. (B-C)	26.41
D	Total Sample Wt. After #200 Wash	149.50	E	Dry Wt.(C-A)	170.02
E	Percent Passing #200 (1-D/C)x100	12.1%	Moisture Content (100 x D/E) (%)		15.5%
Sieve Size (mm)	Sieve Size	Retained Weight	Percent Retained		Percent Passing Total Sample
37.50	1.5"	0.0	0.0%		100.0%
25.00	1.0"	0.00	0.0%		100.0%
19.00	3/4"	0.00	0.0%		100.0%
12.50	1/2"	0.00	0.0%		100.0%
9.50	3/8"	0.00	0.0%		100.0%
4.75	#4	0.00	0.0%		100.0%
2.36	#8	2.40	1.4%		98.6%
1.18	#16	27.30	16.1%		82.5%
0.60	#30	68.00	40.0%		42.5%
0.30	#50	39.60	23.3%		19.2%
0.15	#100	9.40	5.5%		13.7%
0.075	#200	2.80	1.6%		12.1%

<b>Notes:</b>		Maximum Particle Size	Gravel	< 75 mm and > 4.75 mm (#4)	0.0%
		Apparent Relative Density	Coarse Sand	< 4.75 mm and > 2.00 mm (#10)	1.4%
Liquid Limit	34	Fineness Modulus	Medium Sand	< 2.00 mm and > 0.425 mm (#40)	56.1%
Plastic Limit	25	Cu = D60/D10:	Fine Sand	< 0.425 mm and > 0.075 mm (#200)	30.5%
Plastic Index	9	Cc = (D30) <sup>2</sup> / (D10xD60):	% Silt and Clay	< 0.075 mm	12.1%
			Description of Sand & Gravel	Rounded <input type="checkbox"/>	Angular <input type="checkbox"/>
			Hard & Durable <input type="checkbox"/>	Soft <input type="checkbox"/>	Weathered & Friable <input type="checkbox"/>

Organic Content

D10 =

D30 =

D60 =

D50 =

D90 =

ASTM D 422: Particle Size Analysis of Soils

Hydrometer portion of test method not utilized.

ASTM D 421: Dry Preparation of Soil Samples

ASTM D 854: Specific Gravity of Soils

ASTM D 4318: Liquid Limit, Plastic Limit, &amp; Plastic Index of Soils

ASTM D 2487: Classification of Soils for Engineering Purposes (Unified Soil Classification System)

Technician Name:

Brian Urban

Certification #

Technical Responsibility:

Trapp Harris

Signature

Staff Professional

Position



## Liquid Limit, Plastic Limit, and Plastic Index

Project #: **1611-04-386**  
 Project Name: **RBO South Fork Edisto River & Cedar Creek**  
 Client Name: **SCDOT**  
 Client Address: **P.O. Box 191, Columbia, South Carolina, 29202-0191**  
 Boring #: **16** Sample #: **11**  
 Location: **B-16**

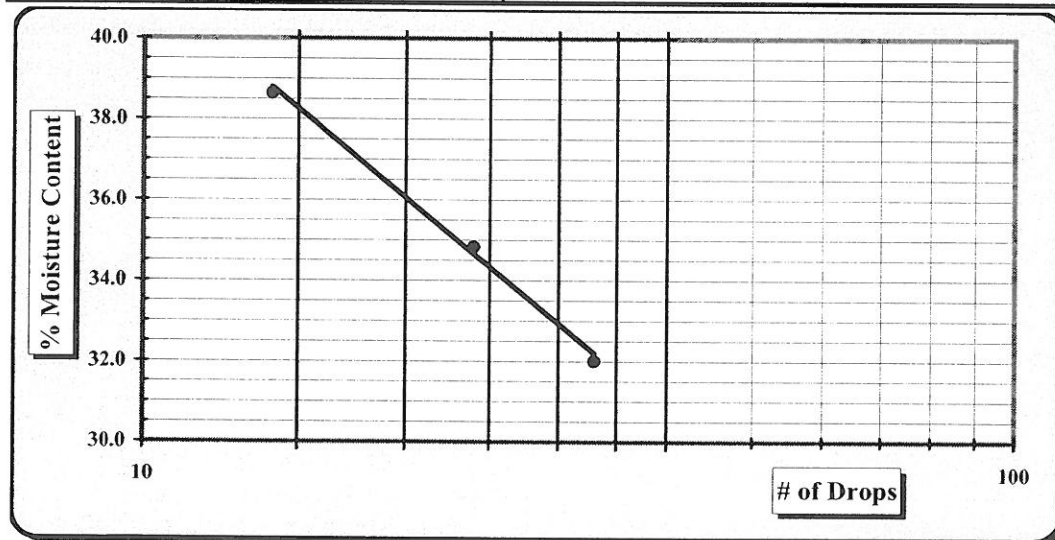
Report Date: **4/27/05**  
 Test Date(s): **4/16/05-4/28/05**

Sample Date: Various

Elevation: 64.5'-66.0'

Sample Description: **Silty Sand (SM, A-2-4) low plasticity, fine to medium sand, white and purple**

Pan #		Liquid Limit						Plastic Limit		
	Test #	1	2	3	4	5	6	1	2	3
	Tare #	44	1	57				H		
A	Tare Weight	11.73	11.54	11.44				11.75		
B	Wet Soil Weight + A	18.62	18.16	17.71				17.25		
C	Dry Soil Weight + A	16.70	16.45	16.19				16.15		
D	Water Weight (B-C)	1.92	1.71	1.52				1.10		
E	Dry Soil Weight (C-A)	4.97	4.91	4.75				4.40		
F	% Moisture Content (D/E)*100	38.6%	34.8%	32.0%				25.0%		
N	# OF DROPS	14	24	33				Moisture Contents determined by ASTM D 2216		
LL	LL = F * FACTOR									
Ave.	Average							25.0%		



One Point Liquid Limit

N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.990	29	1.018
24	0.995	30	1.022
25	1.000		

Notes:

Special Sampling Methods:

Sample Preparation:	Wet Preparation <input type="checkbox"/>	Dry Preparation <input checked="" type="checkbox"/>	Air Dried <input checked="" type="checkbox"/>	NP, Non-Plastic <input type="checkbox"/>
Liquid limit Test:	Multipoint Method <input checked="" type="checkbox"/>	One-point Method <input type="checkbox"/>		Liquid Limit <u>34</u>
Classification:	ASTM D 2487 <input type="checkbox"/>	AASHTO M 145 <input checked="" type="checkbox"/>		Plastic Limit <u>25</u>
Liquid limit Test:	ASTM D 4318 <input type="checkbox"/>	AASHTO T 89 <input checked="" type="checkbox"/>		Plastic Index <u>9</u>
Plastic limit Test:	ASTM D 4318 <input type="checkbox"/>	AASHTO T 90 <input checked="" type="checkbox"/>		Group Symbol <u>A-2-4</u>

Technician Name: Brian Urban

Certification #

Technical Responsibility: Trapp Harris

Signature

Staff Professional

Position





# Particle Size Analysis of Soils

ASTM D 422

Project #: 1611-04-386

Project Name: RBO South Fork Edisto River &amp; Cedar Creek

Client Name: SCDOT

Client Address: PO Box 191, Columbia, SC 29202-0191

Test Date(s): 4/13/05-4/28/05

Report Date: 5/1/05

Boring #: 16

Sample #: 15

Sample Date: Various

Location: B-16

Elevation: 84.5-86.0

Sample Description: Silty Sand (SM, A-2-4) low plasticity, fine to medium sand, white

Particle Size Analysis / Without Hydrometer Analysis			Moisture Content		Natural
				Tare #	216
	Tare Number	216.0	A	Tare Weight	0.00
A	Tare Weight	0.0	B	Wet Weight + Tare Wt.	161.42
B	Total Sample Dry Wt. + Tare Wt.	0.0	C	Dry Weight + Tare Wt.	129.94
C	Total Sample Dry Weight (B-A)	129.94	D	Water Wt. (B-C)	31.48
D	Total Sample Wt. After #200 Wash	107.40	E	Dry Wt.(C-A)	129.94
E	Percent Passing #200 (1-D/C)x100	17.3%	Moisture Content (100 x D/E) (%)		24.2%
Sieve Size (mm)	Sieve Size	Retained Weight	Percent Retained		Percent Passing Total Sample
37.50	1.5"	0.0	0.0%		100.0%
25.00	1.0"	0.00	0.0%		100.0%
19.00	3/4"	0.00	0.0%		100.0%
12.50	1/2"	0.00	0.0%		100.0%
9.50	3/8"	0.00	0.0%		100.0%
4.75	#4	0.00	0.0%		100.0%
2.36	#8	0.10	0.1%		99.9%
1.18	#16	0.30	0.2%		99.7%
0.60	#30	11.80	9.1%		90.6%
0.30	#50	56.60	43.6%		47.1%
0.15	#100	32.70	25.2%		21.9%
0.075	#200	5.90	4.5%		17.3%

<b>Notes:</b>		Maximum Particle Size	Gravel	< 75 mm and > 4.75 mm (#4)	0.0%
		Apparent Relative Density	Coarse Sand	< 4.75 mm and > 2.00 mm (#10)	0.1%
Liquid Limit	33	Fineness Modulus	Medium Sand	< 2.00 mm and > 0.425 mm (#40)	9.3%
Plastic Limit	24	Cu = D60/D10:	Fine Sand	< 0.425 mm and > 0.075 mm (#200)	73.3%
Plastic Index	9	Cc = (D30) <sup>2</sup> / (D10x D60):	% Silt and Clay	< 0.075 mm	17.3%
			Description of Sand & Gravel	Rounded <input type="checkbox"/>	Angular <input type="checkbox"/>
			Hard & Durable <input type="checkbox"/>	Soft <input type="checkbox"/>	Weathered & Friable <input type="checkbox"/>

Organic Content

D10 =

D30 =

D60 =

D50 =

D90 =

ASTM D 422: Particle Size Analysis of Soils

Hydrometer portion of test method not utilized.

ASTM D 421: Dry Preparation of Soil Samples

ASTM D 854: Specific Gravity of Soils

ASTM D 4318: Liquid Limit, Plastic Limit, &amp; Plastic Index of Soils

ASTM D 2487: Classification of Soils for Engineering Purposes (Unified Soil Classification System)

Technician Name:

Brian Urban

Certification #

Technical Responsibility:

Trapp Harris

Signature

Staff Professional

Position





## Liquid Limit, Plastic Limit, and Plastic Index

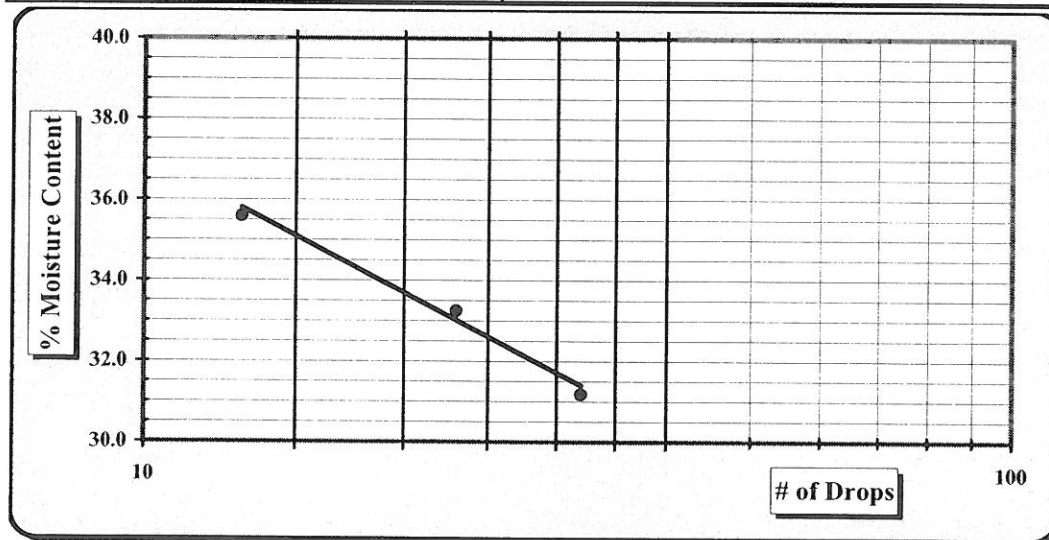
Project #: **1611-04-386**  
 Project Name: RBO South Fork Edisto River & Cedar Creek  
 Client Name: SCDOT  
 Client Address: P.O. Box 191, Columbia, South Carolina, 29202-0191

Report Date: 4/27/05  
 Test Date(s): 4/16/05-4/28/05

Boring #: 16 Sample #: 15 Sample Date: Various  
 Location: B-16 Elevation: 84.5'-86.0'

Sample Description: Silty Sand (SM, A-2-4) low plasticity, fine to medium sand, white

Pan #		Liquid Limit						Plastic Limit		
	Test #	1	2	3	4	5	6	1	2	3
	Tare #	59	60	k				56	f	
A	Tare Weight	11.31	11.57	11.60				11.45	11.81	
B	Wet Soil Weight + A	20.53	21.35	20.52				18.68	19.23	
C	Dry Soil Weight + A	18.11	18.91	18.40				17.29	17.79	
D	Water Weight (B-C)	2.42	2.44	2.12				1.39	1.44	
E	Dry Soil Weight (C-A)	6.80	7.34	6.80				5.84	5.98	
F	% Moisture Content (D/E)*100	35.6%	33.2%	31.2%				23.8%	24.1%	
N	# OF DROPS	13	23	32				Moisture Contents determined by ASTM D 2216		
LL	LL = F * FACTOR									
Ave.	Average							23.9%		



One Point Liquid Limit			
N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.990	29	1.018
24	0.995	30	1.022
25	1.000		

Notes:

### Special Sampling Methods:

Sample Preparation:	Wet Preparation <input type="checkbox"/>	Dry Preparation <input checked="" type="checkbox"/>	Air Dried <input checked="" type="checkbox"/>	NP, Non-Plastic <input type="checkbox"/>
Liquid limit Test:	Multipoint Method <input checked="" type="checkbox"/>	One-point Method <input type="checkbox"/>		Liquid Limit <u>33</u>
Classification:	ASTM D 2487 <input type="checkbox"/>	AASHTO M 145 <input checked="" type="checkbox"/>		Plastic Limit <u>24</u>
Liquid limit Test:	ASTM D 4318 <input type="checkbox"/>	AASHTO T 89 <input checked="" type="checkbox"/>		Plastic Index <u>9</u>
Plastic limit Test:	ASTM D 4318 <input type="checkbox"/>	AASHTO T 90 <input checked="" type="checkbox"/>		Group Symbol <u>A-2-4</u>

Technician Name: Brian Urban

Certification #

Technical Responsibility: Trapp Harris

Signature

Staff Professional

Position

## Particle Size Analysis of Soils

ASTM D 422



Project #: 1611-04-386

Project Name: RBO South Fork Edisto River &amp; Cedar Creek

Client Name: SCDOT

Client Address: PO Box 191, Columbia, SC 29202-0191

Test Date(s): 4/13/05-4/28/05

Report Date: 5/1/05

Boring #: 17

Sample #: 4

Sample Date: Various

Location: B-17

Elevation: 28.8-30.3

Sample Description: Clayey Sand (SC, A-6) low plasticity, fine to medium sand, white

Particle Size Analysis / Without Hydrometer Analysis			Moisture Content		Natural
				Tare #	304
	Tare Number	304.0	A	Tare Weight	0.00
A	Tare Weight	0.0	B	Wet Weight + Tare Wt.	134.92
B	Total Sample Dry Wt. + Tare Wt.	0.0	C	Dry Weight + Tare Wt.	114.88
C	Total Sample Dry Weight (B-A)	114.88	D	Water Wt. (B-C)	20.04
D	Total Sample Wt. After #200 Wash	71.50	E	Dry Wt.(C-A)	114.88
E	Percent Passing #200 (1-D/C)x100	37.8%	Moisture Content (100 x D/E) (%)		17.4%
Sieve Size (mm)	Sieve Size	Retained Weight	Percent Retained		Percent Passing Total Sample
37.50	1.5"	0.0	0.0%		100.0%
25.00	1.0"	0.00	0.0%		100.0%
19.00	3/4"	0.00	0.0%		100.0%
12.50	1/2"	0.00	0.0%		100.0%
9.50	3/8"	0.00	0.0%		100.0%
4.75	#4	0.30	0.3%		99.7%
2.36	#8	2.30	2.0%		97.7%
1.18	#16	19.90	17.3%		80.4%
0.60	#30	22.90	19.9%		60.5%
0.30	#50	16.60	14.4%		46.0%
0.15	#100	7.30	6.4%		39.7%
0.075	#200	2.20	1.9%		37.8%

<b>Notes:</b>		Maximum Particle Size	Gravel	< 75 mm and > 4.75 mm (#4)	0.3%
		Apparent Relative Density	Coarse Sand	< 4.75 mm and > 2.00 mm (#10)	2.0%
Liquid Limit	34	Fineness Modulus	Medium Sand	< 2.00 mm and > 0.425 mm (#40)	37.3%
Plastic Limit	18	Cu = D60/D10:	Fine Sand	< 0.425 mm and > 0.075 mm (#200)	22.7%
Plastic Index	16	Cc = (D30) <sup>2</sup> / (D10xD60):	% Silt and Clay	< 0.075 mm	37.8%
			Description of Sand & Gravel	Rounded <input type="checkbox"/>	Angular <input type="checkbox"/>
			Hard & Durable <input type="checkbox"/>	Soft <input type="checkbox"/>	Weathered & Friable <input type="checkbox"/>

Organic Content				
D10 =	D30 =	D60 =	D50 =	D90 =

ASTM D 422: Particle Size Analysis of Soils

Hydrometer portion of test method not utilized.

ASTM D 421: Dry Preparation of Soil Samples

ASTM D 854: Specific Gravity of Soils

ASTM D 4318: Liquid Limit, Plastic Limit, &amp; Plastic Index of Soils

ASTM D 2487: Classification of Soils for Engineering Purposes (Unified Soil Classification System)

Technician Name:

Brian Urban

Certification #

Technical Responsibility:

Trapp Harris

Signature

Staff Professional

Position



## Liquid Limit, Plastic Limit, and Plastic Index

Project #: **1611-04-386**  
 Project Name: **RBO South Fork Edisto River & Cedar Creek**  
 Client Name: **SCDOT**  
 Client Address: **P.O. Box 191, Columbia, South Carolina, 29202-0191**  
 Boring #: **17** Sample #: **4**  
 Location: **B-17**

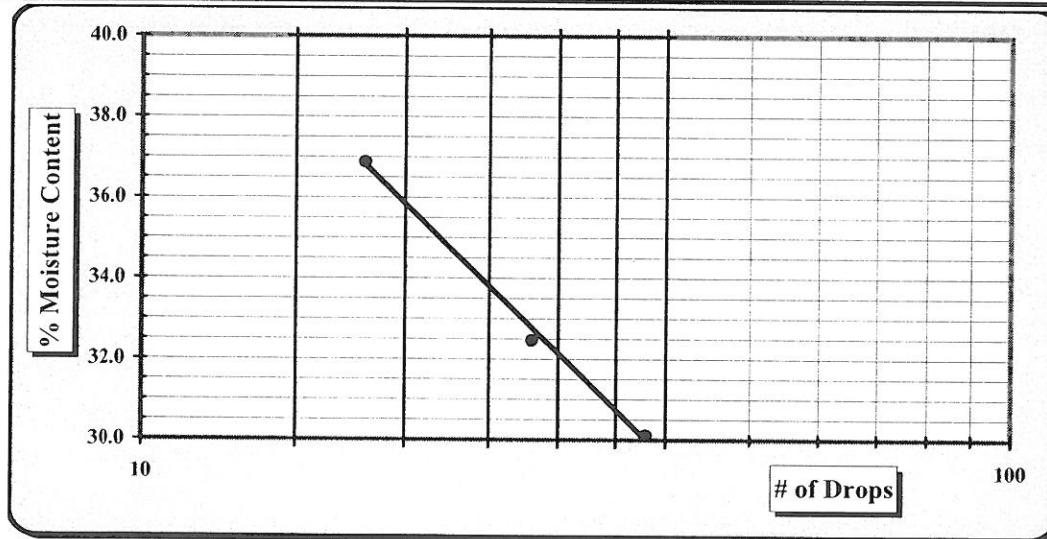
Report Date: **4/27/05**  
 Test Date(s): **4/16/05-4/28/05**

Sample Date: Various

Elevation: 28.8'-30.3'

Sample Description: **Clayey Sand (SC, A-6) low plasticity, fine to medium sand, white**

Pan #		Liquid Limit						Plastic Limit		
	Test #	1	2	3	4	5	6	1	2	3
	Tare #	142	140	119				59	60	
A	Tare Weight	13.72	13.69	13.59				11.31	11.56	
B	Wet Soil Weight + A	24.04	24.30	24.09				15.98	15.53	
C	Dry Soil Weight + A	21.26	21.70	21.66				15.27	14.94	
D	Water Weight (B-C)	2.78	2.60	2.43				0.71	0.59	
E	Dry Soil Weight (C-A)	7.54	8.01	8.07				3.96	3.38	
F	% Moisture Content (D/E)*100	36.9%	32.5%	30.1%				17.9%	17.5%	
N	# OF DROPS	18	28	38				Moisture Contents determined by ASTM D 2216		
LL	LL = F * FACTOR									
Ave.	Average							17.7%		



One Point Liquid Limit			
N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.990	29	1.018
24	0.995	30	1.022
25	1.000		

Notes:

### Special Sampling Methods:

Sample Preparation:	Wet Preparation <input type="checkbox"/>	Dry Preparation <input checked="" type="checkbox"/>	Air Dried <input checked="" type="checkbox"/>	NP, Non-Plastic <input type="checkbox"/>
Liquid limit Test:	Multipoint Method <input checked="" type="checkbox"/>	One-point Method <input type="checkbox"/>		Liquid Limit <u>34</u>
Classification:	ASTM D 2487 <input type="checkbox"/>	AASHTO M 145 <input checked="" type="checkbox"/>		Plastic Limit <u>18</u>
Liquid limit Test:	ASTM D 4318 <input type="checkbox"/>	AASHTO T 89 <input checked="" type="checkbox"/>		Plastic Index <u>16</u>
Plastic limit Test:	ASTM D 4318 <input type="checkbox"/>	AASHTO T 90 <input checked="" type="checkbox"/>		Group Symbol <u>A-6</u>

Technician Name: Brian Urban

Certification #

Technical Responsibility: Trapp Harris

Signature

Staff Professional

Position

## Particle Size Analysis of Soils

ASTM D 422



Project #: 1611-04-386

Project Name: RBO South Fork Edisto River &amp; Cedar Creek

Client Name: SCDOT

Client Address: PO Box 191, Columbia, SC 29202-0191

Test Date(s): 4-13-05/4/28/05

Report Date:

Boring #: 18

Sample #: 1

Sample Date: Various

Location: B-18

Elevation: 15.9-17.4

Sample Description: Silty Sand (SM, A-2-4) low plasticity, fine to medium sand, dark brown

Particle Size Analysis / Without Hydrometer Analysis			Moisture Content		Natural
				Tare #	314
	Tare Number	314.0	A	Tare Weight	0.00
A	Tare Weight	0.0	B	Wet Weight + Tare Wt.	137.02
B	Total Sample Dry Wt. + Tare Wt.	0.0	C	Dry Weight + Tare Wt.	82.42
C	Total Sample Dry Weight (B-A)	82.42	D	Water Wt. (B-C)	54.60
D	Total Sample Wt. After #200 Wash	68.40	E	Dry Wt.(C-A)	82.42
E	Percent Passing #200 (1-D/C)x100	17.0%	Moisture Content (100 x D/E) (%)		66.2%
Sieve Size (mm)	Sieve Size	Retained Weight	Percent Retained		Percent Passing Total Sample
37.50	1.5"	0.0	0.0%		100.0%
25.00	1.0"	0.00	0.0%		100.0%
19.00	3/4"	0.00	0.0%		100.0%
12.50	1/2"	0.00	0.0%		100.0%
9.50	3/8"	0.00	0.0%		100.0%
4.75	#4	0.00	0.0%		100.0%
2.36	#8	0.70	0.8%		99.2%
1.18	#16	2.00	2.4%		96.7%
0.60	#30	3.10	3.8%		93.0%
0.30	#50	4.90	5.9%		87.0%
0.15	#100	19.80	24.0%		63.0%
0.075	#200	37.90	46.0%		17.0%

<b>Notes:</b>		Maximum Particle Size	Gravel	< 75 mm and > 4.75 mm (#4)	0.0%
		Apparent Relative Density	Coarse Sand	< 4.75 mm and > 2.00 mm (#10)	0.8%
Liquid Limit	33	Fineness Modulus	Medium Sand	< 2.00 mm and > 0.425 mm (#40)	6.2%
Plastic Limit	28	Cu = D60/D10:	Fine Sand	< 0.425 mm and > 0.075 mm (#200)	76.0%
Plastic Index	5	Cc = (D30) <sup>2</sup> / (D10xD60):	% Silt and Clay	< 0.075 mm	17.0%
			Description of Sand & Gravel	Rounded <input checked="" type="checkbox"/> Angular <input checked="" type="checkbox"/>	
			Hard & Durable <input checked="" type="checkbox"/> Soft <input type="checkbox"/> Weathered & Friable <input type="checkbox"/>		

Organic Content				
D10 =	D30 =	D60 =	D50 =	D90 =

ASTM D 422: Particle Size Analysis of Soils

Hydrometer portion of test method not utilized.

ASTM D 421: Dry Preparation of Soil Samples

ASTM D 854: Specific Gravity of Soils

ASTM D 4318: Liquid Limit, Plastic Limit, &amp; Plastic Index of Soils

ASTM D 2487: Classification of Soils for Engineering Purposes (Unified Soil Classification System)

Technician Name:

Brian Urban

Certification #

Technical Responsibility:

Trapp Harris

Signature

Staff Professional

Position





## Liquid Limit, Plastic Limit, and Plastic Index

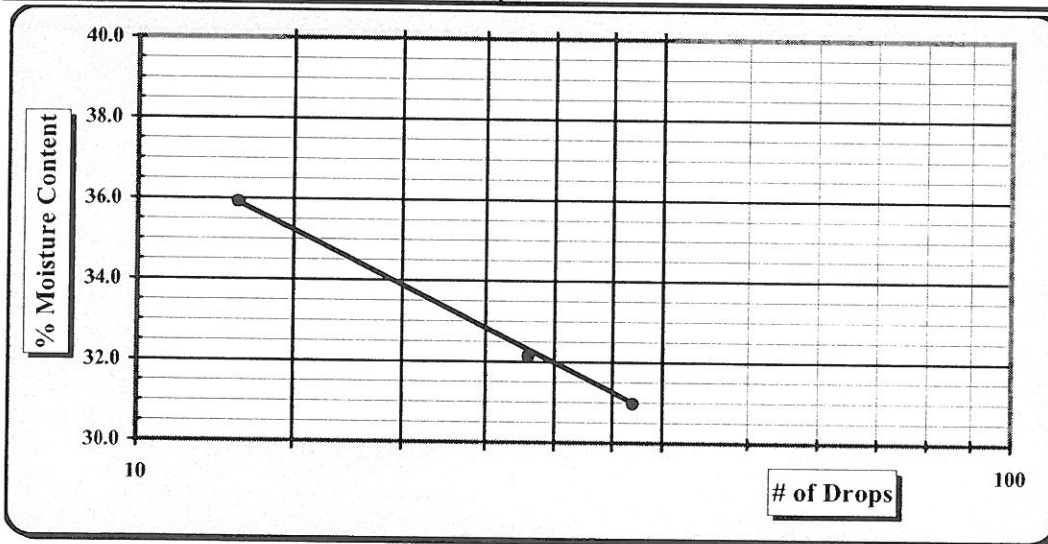
Project #: **1611-04-386**  
 Project Name: **RBO South Fork Edisto River & Cedar Creek**  
 Client Name: **SCDOT**  
 Client Address: **P.O. Box 191, Columbia, South Carolina, 29202-0191**  
 Boring #: **18** Sample #: **1** Sample Date: **Various**

Report Date: **4/26/05**  
 Test Date(s): **4/16/05-4/28/05**

Location: **B-18** Elevation: **15.9'-17.4'**

Sample Description: **Silty Sand (SM, A-2-4) low plasticity, fine to medium sand, dark brown**

Pan #		Liquid Limit						Plastic Limit		
	Test #	1	2	3	4	5	6	1	2	3
	Tare #	120	103	136				118	147	
A	Tare Weight	13.62	13.99	13.77				13.70	13.57	
B	Wet Soil Weight + A	23.42	23.61	21.72				18.46	17.69	
C	Dry Soil Weight + A	20.83	21.27	19.84				17.42	16.81	
D	Water Weight (B-C)	2.59	2.34	1.88				1.04	0.88	
E	Dry Soil Weight (C-A)	7.21	7.28	6.07				3.72	3.24	
F	% Moisture Content (D/E)*100	35.9%	32.1%	31.0%				28.0%	27.2%	
N	# OF DROPS	13	28	37				Moisture Contents determined by ASTM D 2216		
LL	LL = F * FACTOR									
Ave.	Average							27.6%		



One Point Liquid Limit			
N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.990	29	1.018
24	0.995	30	1.022
25	1.000		

Notes:

Special Sampling Methods:

Sample Preparation:	Wet Preparation <input type="checkbox"/>	Dry Preparation <input checked="" type="checkbox"/>	Air Dried <input checked="" type="checkbox"/>	NP, Non-Plastic <input type="checkbox"/>
Liquid limit Test:	Multipoint Method <input checked="" type="checkbox"/>	One-point Method <input type="checkbox"/>		Liquid Limit <u>33</u>
Classification:	ASTM D 2487 <input type="checkbox"/>	AASHTO M 145 <input checked="" type="checkbox"/>		Plastic Limit <u>28</u>
Liquid limit Test:	ASTM D 4318 <input type="checkbox"/>	AASHTO T 89 <input checked="" type="checkbox"/>		Plastic Index <u>5</u>
Plastic limit Test:	ASTM D 4318 <input type="checkbox"/>	AASHTO T 90 <input checked="" type="checkbox"/>		Group Symbol <u>A-2-4</u>

Technician Name: Brian Urban

Certification #

Technical Responsibility: Trapp Harris

Signature

Staff Professional

Position





# Particle Size Analysis of Soils

ASTM D 422

Project #: 1611-04-386

Project Name: RBO South Fork Edisto River &amp; Cedar Creek

Client Name: SCDOT

Client Address: PO Box 191, Columbia, SC 29202-0191

Test Date(s): 4/13/05-4/28/05

Report Date: 5/1/05

Boring #: 18

Sample #: 5

Sample Date: Various

Location: B-18

Elevation: 34.6'-36.1'

Sample Description: Fat Clay (CH, A-7-5) medium plasticity, fine sand, white, purple and orange

Particle Size Analysis / Without Hydrometer Analysis			Moisture Content		Natural
				Tare #	217
	Tare Number	217.0	A	Tare Weight	0.00
A	Tare Weight	0.0	B	Wet Weight + Tare Wt.	144.52
B	Total Sample Dry Wt. + Tare Wt.	0.0	C	Dry Weight + Tare Wt.	116.53
C	Total Sample Dry Weight (B-A)	116.53	D	Water Wt. (B-C)	27.99
D	Total Sample Wt. After #200 Wash	11.00	E	Dry Wt.(C-A)	116.53
E	Percent Passing #200 (1-D/C)x100	90.6%	Moisture Content (100 x D/E) (%)		24.0%
Sieve Size (mm)	Sieve Size	Retained Weight	Percent Retained		Percent Passing Total Sample
37.50	1.5"	0.0	0.0%		100.0%
25.00	1.0"	0.00	0.0%		100.0%
19.00	3/4"	0.00	0.0%		100.0%
12.50	1/2"	0.00	0.0%		100.0%
9.50	3/8"	0.00	0.0%		100.0%
4.75	#4	0.00	0.0%		100.0%
2.36	#8	0.00	0.0%		100.0%
1.18	#16	0.10	0.1%		99.9%
0.60	#30	0.60	0.5%		99.4%
0.30	#50	1.50	1.3%		98.1%
0.15	#100	3.70	3.2%		94.9%
0.075	#200	5.10	4.4%		90.6%

<b>Notes:</b>		Maximum Particle Size	Gravel	< 75 mm and > 4.75 mm (#4)	0.0%
		Apparent Relative Density	Coarse Sand	< 4.75 mm and > 2.00 mm (#10)	0.0%
Liquid Limit	65	Fineness Modulus	Medium Sand	< 2.00 mm and > 0.425 mm (#40)	0.6%
Plastic Limit	30	Cu = D60/D10:	Fine Sand	< 0.425 mm and > 0.075 mm (#200)	8.8%
Plastic Index	35	Cc = (D30) <sup>2</sup> / (D10xD60):	% Silt and Clay	< 0.075 mm	90.6%
			Description of Sand & Gravel	Rounded <input checked="" type="checkbox"/> Angular <input checked="" type="checkbox"/>	
			Hard & Durable <input checked="" type="checkbox"/> Soft <input type="checkbox"/> Weathered & Friable <input type="checkbox"/>		

Organic Content				
D10 =	D30 =	D60 =	D50 =	D90 =

ASTM D 422: Particle Size Analysis of Soils

Hydrometer portion of test method not utilized.

ASTM D 421: Dry Preparation of Soil Samples

ASTM D 854: Specific Gravity of Soils

ASTM D 4318: Liquid Limit, Plastic Limit, &amp; Plastic Index of Soils

ASTM D 2487: Classification of Soils for Engineering Purposes (Unified Soil Classification System)

Technician Name:

Brian Urban

Certification #

Technical Responsibility:

Trapp Harris

Signature

Staff Professional

Position



## Liquid Limit, Plastic Limit, and Plastic Index

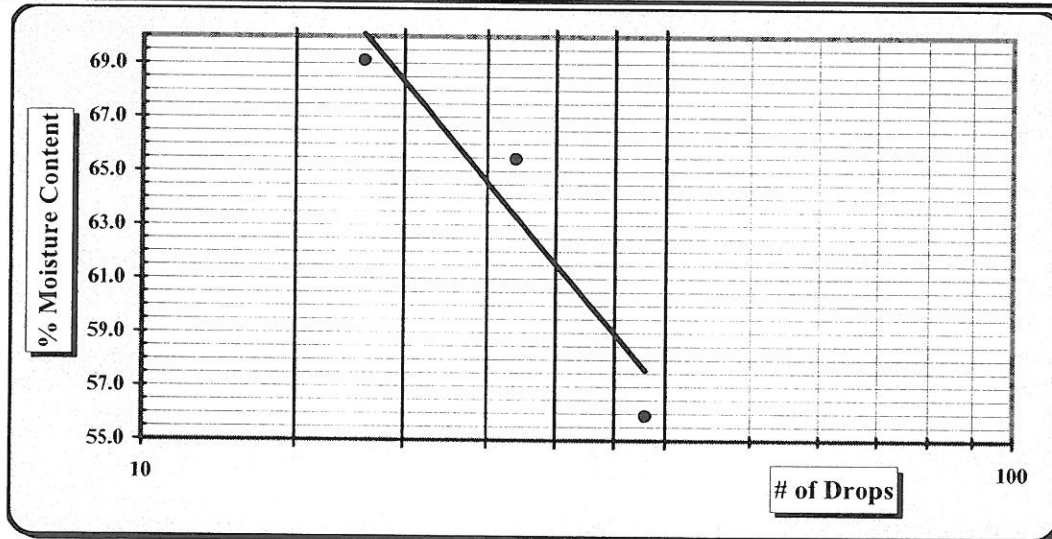
Project #: **1611-04-386**  
 Project Name: **RBO South Fork Edisto River & Cedar Creek**  
 Client Name: **SCDOT**  
 Client Address: **P.O. Box 191, Columbia, South Carolina, 29202-0191**  
 Boring #: **18** Sample #: **5** Sample Date: **Various**

Report Date: **4/27/05**  
 Test Date(s): **4/16/05-4/28/05**

Location: **B-18** Elevation: **34.6'-36.1'**

Sample Description: **Fat Clay (CH, A-7-5) medium plasticity, fine sand, white, purple and orange**

Pan #		Liquid Limit						Plastic Limit		
	Test #	1	2	3	4	5	6	1	2	3
	Tare #	101	108	113				56	57	
A	Tare Weight	13.67	13.38	13.59				11.45	11.44	
B	Wet Soil Weight + A	23.63	23.39	23.46				15.53	15.78	
C	Dry Soil Weight + A	19.56	19.43	19.92				14.58	14.78	
D	Water Weight (B-C)	4.07	3.96	3.54				0.95	1.00	
E	Dry Soil Weight (C-A)	5.89	6.05	6.33				3.13	3.34	
F	% Moisture Content (D/E)*100	69.1%	65.5%	55.9%				30.4%	29.9%	
N	# OF DROPS	18	27	38				Moisture Contents determined by ASTM D 2216		
LL	LL = F * FACTOR									
Ave.	Average							30.1%		



One Point Liquid Limit			
N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.990	29	1.018
24	0.995	30	1.022
25	1.000		

Notes:

### Special Sampling Methods:

Sample Preparation:	Wet Preparation <input type="checkbox"/>	Dry Preparation <input checked="" type="checkbox"/>	Air Dried <input checked="" type="checkbox"/>	NP, Non-Plastic <input type="checkbox"/>
Liquid limit Test:	Multipoint Method <input checked="" type="checkbox"/>	One-point Method <input type="checkbox"/>		Liquid Limit <u>65</u>
Classification:	ASTM D 2487 <input type="checkbox"/>	AASHTO M 145 <input checked="" type="checkbox"/>		Plastic Limit <u>30</u>
Liquid limit Test:	ASTM D 4318 <input type="checkbox"/>	AASHTO T 89 <input checked="" type="checkbox"/>		Plastic Index <u>35</u>
Plastic limit Test:	ASTM D 4318 <input type="checkbox"/>	AASHTO T 90 <input checked="" type="checkbox"/>		Group Symbol <u>A-7-5</u>

Technician Name: Brian Urban

Certification #

Technical Responsibility: Trapp Harris

Signature

Staff Professional

Position



# Particle Size Analysis of Soils

ASTM D 422

Project #: 1611-04-386

Project Name: RBO South Fork Edisto River &amp; Cedar Creek

Client Name: SCDOT

Client Address: PO Box 191, Columbia, SC 29202-0191

Test Date(s): 4/13/05-4/28/05

Report Date: 5/1/05

Boring #: 18

Sample #: 17

Sample Date: Various

Location: B-18

Elevation: 94.6'-96.1'

Sample Description: Silty Sand (SM, A-2-4) low plasticity, fine to medium sand, white

Particle Size Analysis / Without Hydrometer Analysis			Moisture Content		Natural
				Tare #	401
	Tare Number	401.0	A	Tare Weight	0.00
A	Tare Weight	0.0	B	Wet Weight + Tare Wt.	175.12
B	Total Sample Dry Wt. + Tare Wt.	0.0	C	Dry Weight + Tare Wt.	136.06
C	Total Sample Dry Weight (B-A)	136.06	D	Water Wt. (B-C)	39.06
D	Total Sample Wt. After #200 Wash	111.80	E	Dry Wt.(C-A)	136.06
E	Percent Passing #200 (1-D/C)x100	17.8%	Moisture Content (100 x D/E) (%)		28.7%
Sieve Size (mm)	Sieve Size	Retained Weight	Percent Retained		Percent Passing Total Sample
37.50	1.5"	0.0	0.0%		100.0%
25.00	1.0"	0.00	0.0%		100.0%
19.00	3/4"	0.00	0.0%		100.0%
12.50	1/2"	0.00	0.0%		100.0%
9.50	3/8"	0.00	0.0%		100.0%
4.75	#4	0.00	0.0%		100.0%
2.36	#8	0.20	0.1%		99.9%
1.18	#16	0.40	0.3%		99.6%
0.60	#30	6.10	4.5%		95.1%
0.30	#50	45.20	33.2%		61.9%
0.15	#100	52.80	38.8%		23.0%
0.075	#200	7.10	5.2%		17.8%

<b>Notes:</b>		Maximum Particle Size	Gravel	< 75 mm and > 4.75 mm (#4)	0.0%
		Apparent Relative Density	Coarse Sand	< 4.75 mm and > 2.00 mm (#10)	0.1%
Liquid Limit	28	Fineness Modulus	Medium Sand	< 2.00 mm and > 0.425 mm (#40)	4.8%
Plastic Limit	22	Cu = D60/D10:	Fine Sand	< 0.425 mm and > 0.075 mm (#200)	77.2%
Plastic Index	6	Cc = (D30) <sup>2</sup> / (D10xD60):	% Silt and Clay	< 0.075 mm	17.8%
			Description of Sand & Gravel	Rounded <input checked="" type="checkbox"/> Angular <input checked="" type="checkbox"/>	
			Hard & Durable <input checked="" type="checkbox"/> Soft <input type="checkbox"/> Weathered & Friable <input type="checkbox"/>		

Organic Content

D10 =

D30 =

D60 =

D50 =

D90 =

ASTM D 422: Particle Size Analysis of Soils

Hydrometer portion of test method not utilized.

ASTM D 421: Dry Preparation of Soil Samples

ASTM D 854: Specific Gravity of Soils

ASTM D 4318: Liquid Limit, Plastic Limit, &amp; Plastic Index of Soils

ASTM D 2487: Classification of Soils for Engineering Purposes (Unified Soil Classification System)

Technician Name:

Brian Urban

Certification #

Technical Responsibility:

Trapp Harris

Signature

Staff Professional

Position



## Liquid Limit, Plastic Limit, and Plastic Index

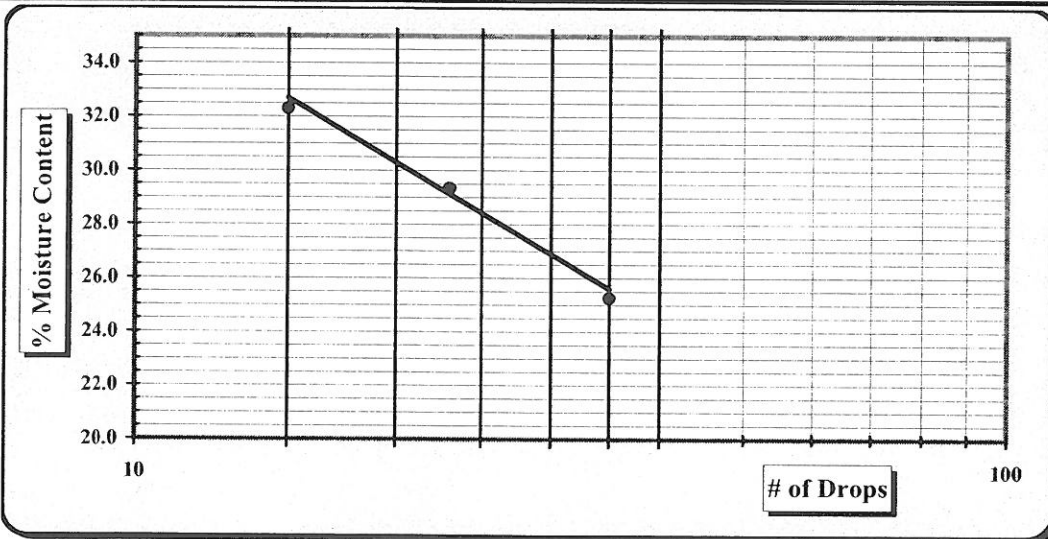
Project #: **1611-04-386**  
 Project Name: RBO South Fork Edisto River & Cedar Creek  
 Client Name: SCDOT  
 Client Address: P.O. Box 191, Columbia, South Carolina, 29202-0191  
 Boring #: 18 Sample #: 17

Report Date: 4/27/05  
 Test Date(s): 4/16/05-4/28/05

Location: B-18 Elevation: 94.6'-96.1'

Sample Description: Silty Sand (SM, A-2-4) low plasticity, fine to medium sand, white

Pan #		Liquid Limit						Plastic Limit		
	Test #	1	2	3	4	5	6	1	2	3
	Tare #	9	31	26				15	4	
A	Tare Weight	13.73	13.93	14.20				14.32	14.39	
B	Wet Soil Weight + A	24.71	23.98	24.32				21.29	21.67	
C	Dry Soil Weight + A	22.03	21.70	22.28				20.04	20.34	
D	Water Weight (B-C)	2.68	2.28	2.04				1.25	1.33	
E	Dry Soil Weight (C-A)	8.30	7.77	8.08				5.72	5.95	
F	% Moisture Content (D/E)*100	32.3%	29.3%	25.2%				21.9%	22.4%	
N	# OF DROPS	15	23	35				Moisture Contents determined by ASTM D 2216		
LL	LL = F * FACTOR									
Ave.	Average							22.1%		



One Point Liquid Limit			
N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.990	29	1.018
24	0.995	30	1.022
25	1.000		

Notes:

### Special Sampling Methods:

Sample Preparation:	Wet Preparation <input type="checkbox"/>	Dry Preparation <input checked="" type="checkbox"/>	Air Dried <input checked="" type="checkbox"/>	NP, Non-Plastic <input type="checkbox"/>
Liquid limit Test:	Multipoint Method <input checked="" type="checkbox"/>	One-point Method <input type="checkbox"/>		Liquid Limit 28
Classification:	ASTM D 2487 <input type="checkbox"/>	AASHTO M 145 <input checked="" type="checkbox"/>		Plastic Limit 22
Liquid limit Test:	ASTM D 4318 <input type="checkbox"/>	AASHTO T 89 <input checked="" type="checkbox"/>		Plastic Index 6
Plastic limit Test:	ASTM D 4318 <input type="checkbox"/>	AASHTO T 90 <input checked="" type="checkbox"/>		Group Symbol A-2-4

Technician Name: Brian Urban

Technical Responsibility: Trapp Harris

Certification #

Signature

Staff Professional

Position



## Particle Size Analysis of Soils

ASTM D 422



Project #: 1611-04-386

Project Name: RBO South Fork Edisto River &amp; Cedar Creek

Client Name: SCDOT

Client Address: PO Box 191, Columbia, SC 29202-0191

Test Date(s): 4/13/05-4/28/05

Report Date: 5/1/05

Boring #: 20

Sample #: 3

Sample Date: Various

Location: B-20

Elevation: 23.9'-25.4'

Sample Description: Sandy Fat Clay (CH, A-7-6) medium plasticity, fine to medium sand, white

Particle Size Analysis / Without Hydrometer Analysis			Moisture Content		Natural
			Tare #		220
	Tare Number	220.0	A	Tare Weight	0.00
A	Tare Weight	0.0	B	Wet Weight + Tare Wt.	123.80
B	Total Sample Dry Wt. + Tare Wt.	0.0	C	Dry Weight + Tare Wt.	100.02
C	Total Sample Dry Weight (B-A)	100.02	D	Water Wt. (B-C)	23.78
D	Total Sample Wt. After #200 Wash	40.30	E	Dry Wt.(C-A)	100.02
E	Percent Passing #200 (1-D/C)x100	59.7%	Moisture Content (100 x D/E) (%)		23.8%
Sieve Size (mm)	Sieve Size	Retained Weight	Percent Retained		Percent Passing Total Sample
37.50	1.5"	0.0	0.0%		100.0%
25.00	1.0"	0.00	0.0%		100.0%
19.00	3/4"	0.00	0.0%		100.0%
12.50	1/2"	0.00	0.0%		100.0%
9.50	3/8"	0.00	0.0%		100.0%
4.75	#4	0.00	0.0%		100.0%
2.36	#8	0.10	0.1%		99.9%
1.18	#16	2.10	2.1%		97.8%
0.60	#30	8.20	8.2%		89.6%
0.30	#50	13.90	13.9%		75.7%
0.15	#100	9.90	9.9%		65.8%
0.075	#200	6.10	6.1%		59.7%

<b>Notes:</b>		Maximum Particle Size	Gravel	< 75 mm and > 4.75 mm (#4)	0.0%
		Apparent Relative Density	Coarse Sand	< 4.75 mm and > 2.00 mm (#10)	0.1%
Liquid Limit	52	Fineness Modulus	Medium Sand	< 2.00 mm and > 0.425 mm (#40)	10.3%
Plastic Limit	20	Cu = D60/D10:	Fine Sand	< 0.425 mm and > 0.075 mm (#200)	29.9%
Plastic Index	32	Cc = (D30) <sup>2</sup> / (D10xD60):	% Silt and Clay	< 0.075 mm	59.7%
			Description of Sand & Gravel	Rounded <input checked="" type="checkbox"/>	Angular <input checked="" type="checkbox"/>
			Hard & Durable <input checked="" type="checkbox"/>	Soft <input type="checkbox"/>	Weathered & Friable <input type="checkbox"/>

Organic Content				
D10 =	D30 =	D60 =	D50 =	D90 =

ASTM D 422: Particle Size Analysis of Soils

Hydrometer portion of test method not utilized.

ASTM D 421: Dry Preparation of Soil Samples

ASTM D 854: Specific Gravity of Soils

ASTM D 4318: Liquid Limit, Plastic Limit, &amp; Plastic Index of Soils

ASTM D 2487: Classification of Soils for Engineering Purposes (Unified Soil Classification System)

Technician Name:

Brian Urban

Certification #

Technical Responsibility:

Trapp Harris

Signature

Staff Professional

Position





# Liquid Limit, Plastic Limit, and Plastic Index

Project #: **1611-04-386**  
 Project Name: RBO South Fork Edisto River & Cedar Creek  
 Client Name: SCDOT  
 Client Address: P.O. Box 191, Columbia, South Carolina, 29202-0191

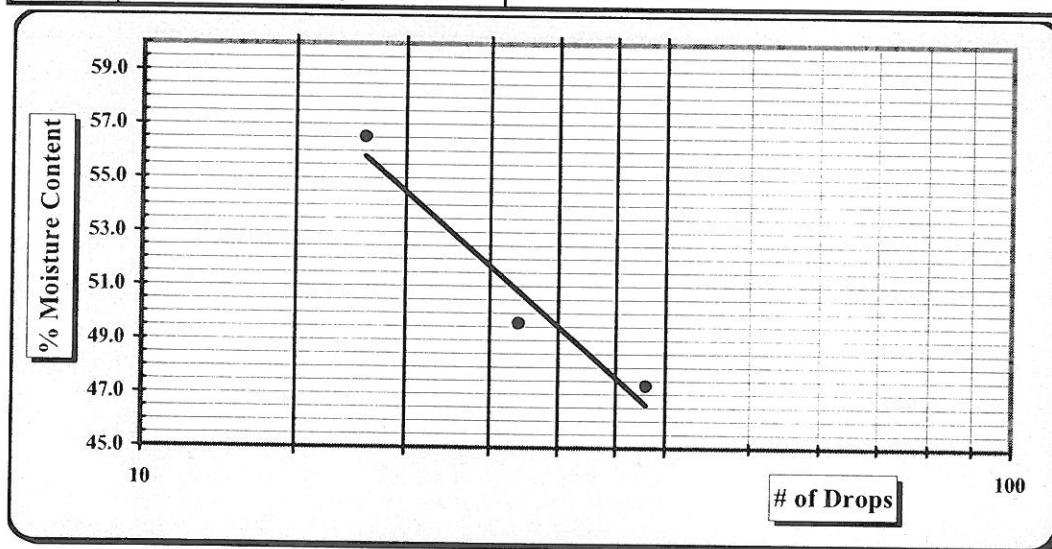
Report Date: 4/27/05  
 Test Date(s): 4/16/05-4/28/05

Boring #: 20 Sample #: 3 Sample Date: Various

Location: B-20 Elevation: 23.9'-25.4'

Sample Description: Sandy Fat Clay (CH, A-7-6) medium plasticity, fine to medium sand, white

Pan #		Liquid Limit						Plastic Limit		
	Test #	1	2	3	4	5	6	1	2	3
	Tare #	102	107	132				j	k	
A	Tare Weight	13.78	13.60	13.65				11.70	11.61	
B	Wet Soil Weight + A	22.42	23.67	24.61				16.15	18.14	
C	Dry Soil Weight + A	19.30	20.33	21.09				15.40	17.04	
D	Water Weight (B-C)	3.12	3.34	3.52				0.75	1.10	
E	Dry Soil Weight (C-A)	5.52	6.73	7.44				3.70	5.43	
F	% Moisture Content (D/E)*100	56.5%	49.6%	47.3%				20.3%	20.3%	
N	# OF DROPS	18	27	38				Moisture Contents determined by ASTM D 2216		
LL	LL = F * FACTOR									
Ave.	Average							20.3%		



One Point Liquid Limit			
N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.990	29	1.018
24	0.995	30	1.022
25	1.000		

Notes:

## Special Sampling Methods:

Sample Preparation:	Wet Preparation <input type="checkbox"/>	Dry Preparation <input checked="" type="checkbox"/>	Air Dried <input checked="" type="checkbox"/>	NP, Non-Plastic <input type="checkbox"/>
Liquid limit Test:	Multipoint Method <input checked="" type="checkbox"/>	One-point Method <input type="checkbox"/>		Liquid Limit 52
Classification:	ASTM D 2487 <input type="checkbox"/>	AASHTO M 145 <input checked="" type="checkbox"/>		Plastic Limit 20
Liquid limit Test:	ASTM D 4318 <input type="checkbox"/>	AASHTO T 89 <input checked="" type="checkbox"/>		Plastic Index 32
Plastic limit Test:	ASTM D 4318 <input type="checkbox"/>	AASHTO T 90 <input checked="" type="checkbox"/>		Group Symbol A-7-6

Technician Name: Brian Urban

Certification #

Technical Responsibility: Trapp Harris

Signature

Staff Professional

Position



## Particle Size Analysis of Soils

Laboratory Record Version 4.0

Report Date:

4/29/05

Project #: 1611-04-386

Test Date(s): 4/13/05-4/28/05

Liquid Limit: 33

Project Name: RBO South Fork Edisto River & Cedar Creek

Client Name: SCDOT

Plastic Limit: 19

Client Address: P.O. Box 191, Columbia, South Carolina, 29202-0191

Plastic Index: 14

Boring #: 21

Sample #: 1

Sample Date: Various

Soil Mortar (portion passing the #10 sieve)

Location: B-21

Elevation: 15.0'-16.5'

Sample Description:				Sandy Lean Clay (CL, A-6) low plasticity, fine to medium sand, gray				Soil Mortar							
Pan #:		2		Beaker #:		2		Specific Gravity:		2.548		1.0"		0.0	
Hydrometer Jar #:				8368				Pan # (washed sample):				3/4"		0.0	
Pan Tare Weight (grams):				0.00				Moisture Content				Hygroscopic		Natural	
Total Sample Wet Wt. + tare wt. (grams):				115.77				Tare #				126		3/8"	
Weight of Total Sample Air Dried:				115.77				Tare Wt.				13.78		#4	
Weight of Air Dried Hydrometer Sample (g):				115.77				Wet Wt. + A				36.99		#10	
Total Sample Oven Dried:				114.53				Dry Wt. + A				36.74		#30	
Hydrometer Sample Oven Dried (W):				114.52				Water Wt. (B-C)				0.25		#40	
% Passing #10:				99.6%				Dry Wt.(C-A)				22.96		#50	
Correction Factor a (Table 1):				1.03				% Moisture (100 x D/E)				1.09%		#100	
														34.0	
														55.2	
														51.8%	
														51.6%	

Notes:	Description of Sand & Gravel Particles:	Rounded <input checked="" type="checkbox"/>	Angular <input checked="" type="checkbox"/>	Hard & Durable <input checked="" type="checkbox"/>	Soft <input type="checkbox"/>	Weathered & Friable <input type="checkbox"/>
Maximum Particle Size:		Total Sand:	48.4%	< 4.74 mm and > 0.075 mm	Type:	Mechanical Stirring Apparatus (A)
% Gravel:	0.0% < 75 mm and > 4.75 mm	Silt & Clay:	51.6%	< 0.075	Dispersion Time:	1 min.
Coarse Sand:	0.4% < 4.75 mm and > 2.00 mm	Silt:	21.6%	< 0.075 and > 0.005 mm	Sodium Hexametaphosphate:	40 g./ Liter
Medium Sand:	15.4% < 2.00 mm and > 0.425 mm	Clay:	30.0%	< 0.005 mm		
Fine Sand:	32.6% < 0.425 mm and > 0.075 mm	Colloids:	20.0%	< 0.001 mm	Hydrometer:	151H <input type="checkbox"/> 152H <input checked="" type="checkbox"/>

Time		Temp.	Hydrometer		Corrections		Hydrometer		Percent Passing		Table 2	Table 3	Diameter	
Clock	T (Min.)	(°C)	Reading	Control	Cylinder	Composite	Correction	R	P(-#10) = (R x a / W) x 100	P (total) = P x % Passing #10	L	K	K x ((L/T) <sup>1/2</sup> )	
11:47	2	23.4	44.0	4.0	4.0	3.0	3.0	40.0	36.0%	35.8%	9.7	0.01381	0.03041	
11:50	5	23.4	44.0	4.0	4.0	3.0	3.0	40.0	36.0%	35.8%	9.7	0.01381	0.01924	
12:00	15	23.3	42.0	4.0	4.0	3.0	3.0	38.0	34.2%	34.0%	10.1	0.01381	0.01133	
12:15	30	23.2	41.0	4.0	4.0	3.0	3.0	37.0	33.3%	33.1%	10.2	0.01381	0.00805	
12:45	60	23.1	39.0	4.0	4.0	3.0	3.0	35.0	31.5%	31.3%	10.6	0.01381	0.00580	
3:55	250	21.6	35.0	4.0	4.0	3.5	3.5	31.0	27.9%	27.8%	11.2	0.01414	0.00299	
11:45	1440	22.0	29.0	4.0	4.0	3.3	3.3	25.0	22.5%	22.4%	12.2	0.01397	0.00129	
11:45	2880	22.0	26.0	4.0	4.0	3.3	3.3	22.0	19.8%	19.7%	12.7	0.01397	0.00093	

Technician Name / Certification #		References:		ASTM D 421: Dry Preparation of Soil Samples		ASTM D 422: Particle Size Analysis of Soils	
Brian Urban		ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass		ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils		ASTM D 854: Specific Gravity of Soils	
Technical Responsibility: Trapp Harris		ASTM D 2487: Classification of Soils for Engineering Purposes (Unified Soil Classification System)		Position: Staff Professional			

# Particle Size Analysis of Soils

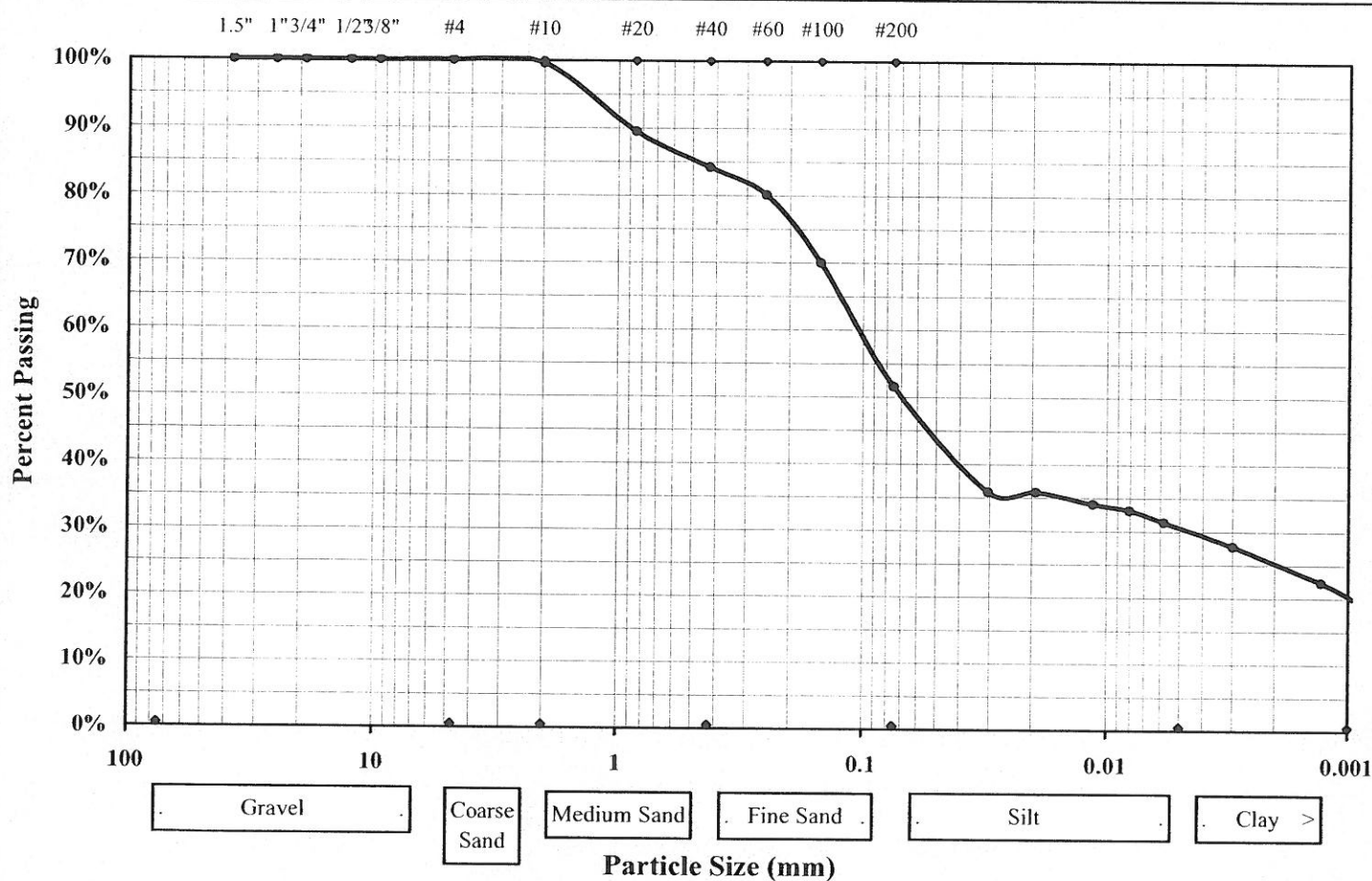
ASTM D 422



S&ME Project #: **1611-04-386**  
 Project Name: **RBO South Fork Edisto River & Cedar Creek**  
 Client Name: **SCDOT**  
 Client Address: **P.O. Box 191, Columbia, South Carolina, 29202-0191**

Report Date: **4/29/05**  
 Test Date(s): **4/13/05-4/28/05**

Boring #: **21** Sample #: **1** Sample Date: **Various**  
 Location: **B-21** Elevation: **15.0'-16.5'**  
 Sample Description: **Sandy Lean Clay (CL, A-6) low plasticity, fine to medium sand, gray**



Moisture Content		Gravel	0.0%	Liquid Limit	33
Silt & Clay (% Passing #200)	51.6%	Sand	48.4%	Plastic Limit	19
Maximum Particle Size	0	Silt	21.6%	Plastic Index	14
Specific Gravity	2.548	Clay	30.0%	Colloids	20.0%

Description of Sand & Gravel Particles: Rounded ☒ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐  
 ASTM D 422: Particle Size Analysis of Soils  
 Dispersing Agent: Sodium Hexametaphosphate: 40 g./ Liter  
 Mechanical Stirring Apparatus (A) Length of Dispersion Period: 1 min.

References: ASTM D 854: Specific Gravity of Soils  
 ASTM D 421: Dry Preparation of Soil Samples  
 ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass  
 ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils  
 ASTM D 2487: Classification of Soils for Engineering Purposes (Unified Soil Classification System)

Technical Responsibility / Position: **Trapp Harris**

Staff Professional



# SPECIFIC GRAVITY OF SOILS

Test Method A

## ASTM D-854

PROJECT NO 1611-05-386 BORING NO B-21  
 PROJECT NAME RBO South Fork Edisto & Cedar Creek SAMPLE NO 1  
 DATE 4/21/2005 DEPTH 15.0'-16.5'  
 DESCRIPTION Sandy Lean Clay (CL, A-6) low plasticity, fine to medium sand, gray  
 TESTED BY BU COMPUTED BY BU CHECKED BY BU

VOL FLASK NO 1	VOL FLASK NO	VOL FLASK NO
1. WT. OF SOIL & VOL FLASK 82.87 g	1. WT. OF SOIL & VOL FLASK g	1. WT. OF SOIL & VOL FLASK g
2. Wt. of flask 62.35 g	2. Wt. of flask g	2. Wt. of flask g
A. WT. OF SOIL 20.52 g	A. WT. OF SOIL 0 g	A. WT. OF SOIL g
B. WT. OF VOL. (from vol. Flask chart) FLASK & WATER 161.85 g	B. WT. OF VOL. (from vol. Flask chart) FLASK & WATER g	B. WT. OF VOL. (from vol. Flask chart) FLASK & WATER g
WATER TEM 27 °C	WATER TEMP. °C	WATER TEMP. °C
C. WT. OF VOL. FLASK, SOIL & WATER 174.33 g	C. WT. OF VOL. FLASK, SOIL & WATER g	C. WT. OF VOL. FLASK, SOIL & WATER g
D. SPECIFIC GRAVITY = $\frac{A}{A+(B-C)} = 2.552$ g	D. SPECIFIC GRAVITY = $\frac{A}{A+(B-C)} =$ g	D. SPECIFIC GRAVITY = $\frac{A}{A+(B-C)} =$ g

SPECIFIC GRAVITY (CORRECTED)  $G_s = D \cdot K =$

H <sub>2</sub> O TEMP. °C	CORRECTION FACTOR, K
18	1.0004
19	1.0002
20	1.0000
21	0.9998
22	0.9996
23	0.9993
24	0.9991
25	0.9989
26	0.9986
27	0.9983
28	0.9980
29	0.9977
30	0.9974

FLASK NO. 1  
 $G_s = D \cdot K = 2.548$

FLASK NO. 0  
 $G_s = D \cdot K =$

FLASK NO. 0  
 $G_s = D \cdot K =$

AVERAGE  
 $G_s = 2.548$



## Particle Size Analysis of Soils

ASTM D 422



Project #: 1611-04-386

Project Name: RBO South Fork Edisto River &amp; Cedar Creek

Client Name: SCDOT

Client Address: PO Box 191, Columbia, South Carolina, 29202-0191

Test Date(s): 4/13/05-4/28/05

Report Date: 5/1/05

Boring #: 21

Sample #: 1

Sample Date: Various

Location: B-21

Elevation: 15.0'-16.5'

Sample Description: Sandy Lean Clay (CL, A-6) low plasticity, fine to medium sand, gray

Particle Size Analysis / Without Hydrometer Analysis			Moisture Content		Natural
				Tare #	2
	Tare Number	2.0	A	Tare Weight	0.00
A	Tare Weight	0.0	B	Wet Weight + Tare Wt.	28.86
B	Total Sample Dry Wt. + Tare Wt.	0.0	C	Dry Weight + Tare Wt.	20.79
C	Total Sample Dry Weight (B-A)	116.24	D	Water Wt. (B-C)	8.07
D	Total Sample Wt. After #200 Wash	55.20	E	Dry Wt.(C-A)	20.79
E	Percent Passing #200 (1-D/C)x100	52.5%	Moisture Content (100 x D/E) (%)		38.8%
Sieve Size (mm)	Sieve Size	Retained Weight	Percent Retained		Percent Passing Total Sample
37.50	1.5"	0.0	0.0%		100.0%
25.00	1.0"	0.00	0.0%		100.0%
19.00	3/4"	0.00	0.0%		100.0%
12.50	1/2"	0.00	0.0%		100.0%
9.50	3/8"	0.00	0.0%		100.0%
4.75	#4	0.00	0.0%		100.0%
2.36	#8	0.20	0.2%		99.8%
1.18	#16	2.80	2.4%		97.4%
0.60	#30	8.60	7.4%		90.0%
0.30	#50	10.80	9.3%		80.7%
0.15	#100	11.60	10.0%		70.8%
0.075	#200	21.20	18.2%		52.5%

<b>Notes:</b>		Maximum Particle Size	Gravel	< 75 mm and > 4.75 mm (#4)	0.0%
		Apparent Relative Density	Coarse Sand	< 4.75 mm and > 2.00 mm (#10)	0.2%
Liquid Limit	33	Fineness Modulus	Medium Sand	< 2.00 mm and > 0.425 mm (#40)	9.8%
Plastic Limit	19	Cu = D60/D10:	Fine Sand	< 0.425 mm and > 0.075 mm (#200)	37.5%
Plastic Index	14	Cc = (D30) <sup>2</sup> / (D10xD60):	% Silt and Clay	< 0.075 mm	52.5%
		Description of Sand & Gravel		Rounded <input checked="" type="checkbox"/>	Angular <input checked="" type="checkbox"/>
		Hard & Durable <input checked="" type="checkbox"/>		Soft <input type="checkbox"/>	Weathered & Friable <input type="checkbox"/>

Organic Content				
D10 =	D30 =	D60 =	D50 =	D90 =

ASTM D 422: Particle Size Analysis of Soils

Hydrometer portion of test method not utilized.

ASTM D 421: Dry Preparation of Soil Samples

ASTM D 854: Specific Gravity of Soils

ASTM D 4318: Liquid Limit, Plastic Limit, &amp; Plastic Index of Soils

ASTM D 2487: Classification of Soils for Engineering Purposes (Unified Soil Classification System)

Technician Name:

Brian Urban

Certification #

Technical Responsibility:

Trapp Harris

Signature

Staff Professional

Position





## Liquid Limit, Plastic Limit, and Plastic Index

Project #: **1611-04-386**  
 Project Name: **RBO South Fork Edisto River & Cedar Creek**  
 Client Name: **SCDOT**  
 Client Address: **P.O. Box 191, Columbia, South Carolina, 29202-0191**

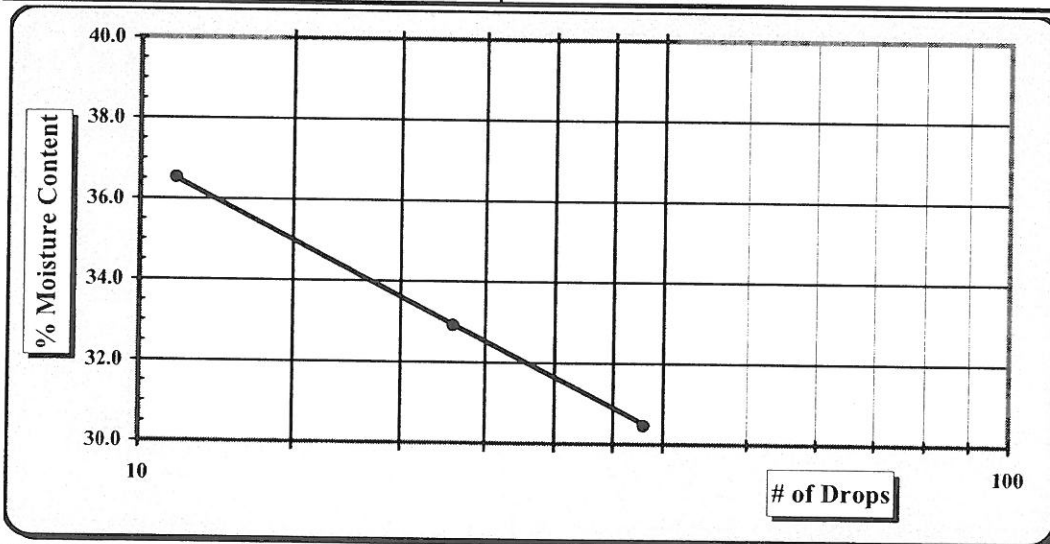
Report Date: **4/26/05**  
 Test Date(s): **4/16/05-4/28/05**

Boring #: **21** Sample #: **1** Sample Date: **Various**

Location: **B-21** Elevation: **15.0'-16.5'**

Sample Description: **Sandy Lean Clay (CL, A-6) low plasticity, fine to medium sand, gray**

Pan #		Liquid Limit						Plastic Limit		
	Test #	1	2	3	4	5	6	1	2	3
	Tare #	142	118	130				111	103	
A	Tare Weight	13.71	13.70	13.75				13.57	13.99	
B	Wet Soil Weight + A	22.98	24.28	24.03				19.25	19.37	
C	Dry Soil Weight + A	20.50	21.66	21.63				18.34	18.54	
D	Water Weight (B-C)	2.48	2.62	2.40				0.91	0.83	
E	Dry Soil Weight (C-A)	6.79	7.96	7.88				4.77	4.55	
F	% Moisture Content (D/E)*100	36.5%	32.9%	30.5%				19.1%	18.2%	
N	# OF DROPS	11	23	38				Moisture Contents determined by ASTM D 2216		
LL	LL = F * FACTOR									
Ave.	Average							18.7%		



One Point Liquid Limit			
N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.990	29	1.018
24	0.995	30	1.022
25	1.000		

Notes:

### Special Sampling Methods:

Sample Preparation:	Wet Preparation <input type="checkbox"/>	Dry Preparation <input checked="" type="checkbox"/>	Air Dried <input checked="" type="checkbox"/>	NP, Non-Plastic <input type="checkbox"/>
Liquid limit Test:	Multipoint Method <input checked="" type="checkbox"/>	One-point Method <input type="checkbox"/>		Liquid Limit <u>33</u>
Classification:	ASTM D 2487 <input type="checkbox"/>	AASHTO M 145 <input checked="" type="checkbox"/>		Plastic Limit <u>19</u>
Liquid limit Test:	ASTM D 4318 <input type="checkbox"/>	AASHTO T 89 <input checked="" type="checkbox"/>		Plastic Index <u>14</u>
Plastic limit Test:	ASTM D 4318 <input type="checkbox"/>	AASHTO T 90 <input checked="" type="checkbox"/>		Group Symbol <u>A-6</u>

Technician Name: Brian Urban

Certification #

Technical Responsibility: Trapp Harris

Signature

Staff Professional

Position

## Particle Size Analysis of Soils

ASTM D 422



Project #: 1611-04-386

Project Name: RBO South Fork Edisto River &amp; Cedar Creek

Client Name: SCDOT

Client Address: PO Box 191, Columbia, SC 29202-0191

Test Date(s): 4/13/05-4/28/05

Report Date: 5/1/05

Boring #: 21

Sample #: 3

Sample Date: Various

Location: B-21

Elevation: 24.8'-26.3'

Sample Description: Fat Clay w/ Sand (CH, A-7-6) medium plasticity, fine to medium sand, gray

Particle Size Analysis / Without Hydrometer Analysis			Moisture Content		Natural
				Tare #	215
	Tare Number	215.0	A	Tare Weight	0.00
A	Tare Weight	0.0	B	Wet Weight + Tare Wt.	134.34
B	Total Sample Dry Wt. + Tare Wt.	0.0	C	Dry Weight + Tare Wt.	104.03
C	Total Sample Dry Weight (B-A)	104.03	D	Water Wt. (B-C)	30.31
D	Total Sample Wt. After #200 Wash	27.80	E	Dry Wt.(C-A)	104.03
E	Percent Passing #200 (1-D/C)x100	73.3%	Moisture Content (100 x D/E) (%)		29.1%
Sieve Size (mm)	Sieve Size	Retained Weight	Percent Retained		Percent Passing Total Sample
37.50	1.5"	0.0	0.0%		100.0%
25.00	1.0"	0.00	0.0%		100.0%
19.00	3/4"	0.00	0.0%		100.0%
12.50	1/2"	0.00	0.0%		100.0%
9.50	3/8"	0.00	0.0%		100.0%
4.75	#4	0.00	0.0%		100.0%
2.36	#8	0.00	0.0%		100.0%
1.18	#16	1.40	1.3%		98.7%
0.60	#30	5.00	4.8%		93.8%
0.30	#50	9.30	8.9%		84.9%
0.15	#100	7.50	7.2%		77.7%
0.075	#200	4.60	4.4%		73.3%

<b>Notes:</b>		Maximum Particle Size	Gravel	< 75 mm and > 4.75 mm (#4)	0.0%
		Apparent Relative Density	Coarse Sand	< 4.75 mm and > 2.00 mm (#10)	0.0%
Liquid Limit	55	Fineness Modulus	Medium Sand	< 2.00 mm and > 0.425 mm (#40)	6.2%
Plastic Limit	22	Cu = D60/D10:	Fine Sand	< 0.425 mm and > 0.075 mm (#200)	20.6%
Plastic Index	33	Cc = (D30) <sup>2</sup> / (D10xD60):	% Silt and Clay	< 0.075 mm	73.3%
			Description of Sand & Gravel	Rounded <input checked="" type="checkbox"/> Angular <input checked="" type="checkbox"/>	
			Hard & Durable <input checked="" type="checkbox"/> Soft <input type="checkbox"/> Weathered & Friable <input type="checkbox"/>		

Organic Content

D10 =

D30 =

D60 =

D50 =

D90 =

ASTM D 422: Particle Size Analysis of Soils

Hydrometer portion of test method not utilized.

ASTM D 421: Dry Preparation of Soil Samples

ASTM D 854: Specific Gravity of Soils

ASTM D 4318: Liquid Limit, Plastic Limit, &amp; Plastic Index of Soils

ASTM D 2487: Classification of Soils for Engineering Purposes (Unified Soil Classification System)

Technician Name:

Brian Urban

Certification #

Technical Responsibility:

Trapp Harris

Signature

Staff Professional

Position



# Liquid Limit, Plastic Limit, and Plastic Index

Project #: **1611-04-386**  
 Project Name: RBO South Fork Edisto River & Cedar Creek  
 Client Name: SCDOT  
 Client Address: P.O. Box 191, Columbia, South Carolina, 29202-0191

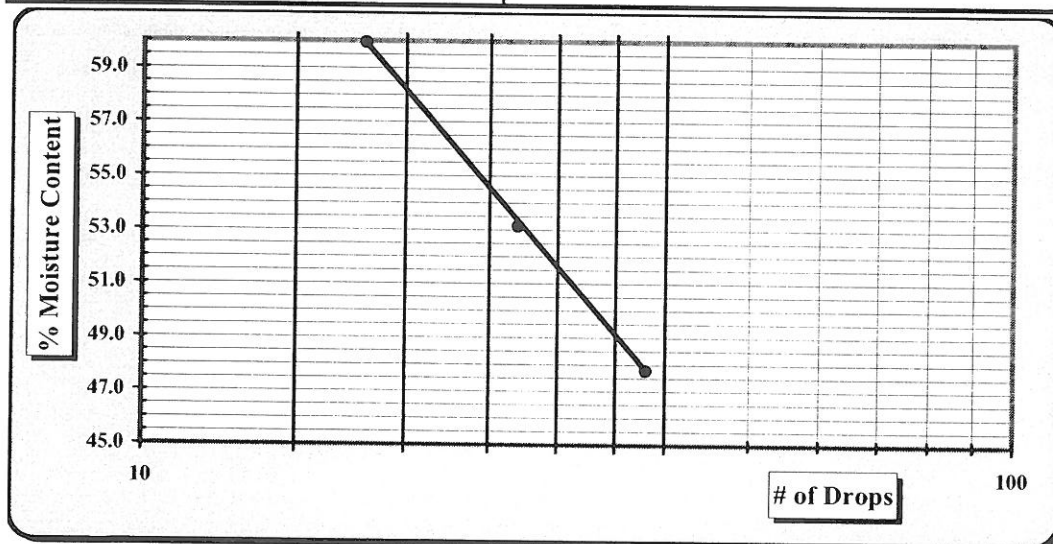
Report Date: 4/27/05  
 Test Date(s): 4/16/05-4/28/05

Boring #: 21 Sample #: 3 Sample Date: Various

Location: B-21 Elevation: 24.8'-26.3'

Sample Description: Fat Clay w/ Sand (CH, A-7-6) medium plasticity, fine to medium sand, gray

Pan #		Liquid Limit						Plastic Limit		
	Test #	1	2	3	4	5	6	1	2	3
	Tare #	26	100	140				44	h	
A	Tare Weight	14.21	13.84	14.08				11.74	11.74	
B	Wet Soil Weight + A	25.31	23.64	24.66				14.59	13.34	
C	Dry Soil Weight + A	21.15	20.24	21.24				14.08	13.06	
D	Water Weight (B-C)	4.16	3.40	3.42				0.51	0.28	
E	Dry Soil Weight (C-A)	6.94	6.40	7.16				2.34	1.32	
F	% Moisture Content (D/E)*100	59.9%	53.1%	47.8%				21.8%	21.2%	
N	# OF DROPS	18	27	38				Moisture Contents determined by ASTM D 2216		
LL	LL = F * FACTOR									
Ave.	Average							21.5%		



One Point Liquid Limit			
N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.990	29	1.018
24	0.995	30	1.022
25	1.000		

Notes:

## Special Sampling Methods:

Sample Preparation:	Wet Preparation <input type="checkbox"/>	Dry Preparation <input checked="" type="checkbox"/>	Air Dried <input checked="" type="checkbox"/>	NP, Non-Plastic <input type="checkbox"/>
Liquid limit Test:	Multipoint Method <input checked="" type="checkbox"/>	One-point Method <input type="checkbox"/>		Liquid Limit 55
Classification:	ASTM D 2487 <input type="checkbox"/>	AASHTO M 145 <input checked="" type="checkbox"/>		Plastic Limit 22
Liquid limit Test:	ASTM D 4318 <input type="checkbox"/>	AASHTO T 89 <input checked="" type="checkbox"/>		Plastic Index 33
Plastic limit Test:	ASTM D 4318 <input type="checkbox"/>	AASHTO T 90 <input checked="" type="checkbox"/>		Group Symbol A-7-6

Technician Name: Brian Urban

Technical Responsibility: Trapp Harris

Certification #

Signature

Staff Professional

Position

## Particle Size Analysis of Soils

ASTM D 422



Project #: 1611-04-386

Project Name: RBO South Fork Edisto River &amp; Cedar Creek

Client Name: SCDOT

Client Address: PO Box 191, Columbia, SC 29202-0191

Test Date(s): 4/13/05-4/28/05

Report Date: 5/1/05

Boring #: 21

Sample #: 11

Sample Date: Various

Location: B-21

Elevation: 65.6'-67.1'

Sample Description: Elastic Silt w/ Sand (MH, A-7-5) medium plasticity, fine to medium sand, light tan and purple

Particle Size Analysis / Without Hydrometer Analysis			Moisture Content		Natural
				Tare #	504
	Tare Number	504.0	A	Tare Weight	0.00
A	Tare Weight	0.0	B	Wet Weight + Tare Wt.	164.22
B	Total Sample Dry Wt. + Tare Wt.	0.0	C	Dry Weight + Tare Wt.	129.21
C	Total Sample Dry Weight (B-A)	129.21	D	Water Wt. (B-C)	35.01
D	Total Sample Wt. After #200 Wash	34.40	E	Dry Wt.(C-A)	129.21
E	Percent Passing #200 (1-D/C)x100	73.4%	Moisture Content (100 x D/E) (%)		27.1%
Sieve Size (mm)	Sieve Size	Retained Weight	Percent Retained		Percent Passing Total Sample
37.50	1.5"	0.0	0.0%		100.0%
25.00	1.0"	0.00	0.0%		100.0%
19.00	3/4"	0.00	0.0%		100.0%
12.50	1/2"	0.00	0.0%		100.0%
9.50	3/8"	0.00	0.0%		100.0%
4.75	#4	0.00	0.0%		100.0%
2.36	#8	0.00	0.0%		100.0%
1.18	#16	0.00	0.0%		100.0%
0.60	#30	0.20	0.2%		99.8%
0.30	#50	0.20	0.2%		99.7%
0.15	#100	5.80	4.5%		95.2%
0.075	#200	28.20	21.8%		73.4%

<b>Notes:</b>		Maximum Particle Size	Gravel	< 75 mm and > 4.75 mm (#4)	0.0%
		Apparent Relative Density	Coarse Sand	< 4.75 mm and > 2.00 mm (#10)	0.0%
Liquid Limit	50	Fineness Modulus	Medium Sand	< 2.00 mm and > 0.425 mm (#40)	0.2%
Plastic Limit	31	Cu = D60/D10:	Fine Sand	< 0.425 mm and > 0.075 mm (#200)	26.5%
Plastic Index	19	Cc = (D30) <sup>2</sup> / (D10xD60):	% Silt and Clay	< 0.075 mm	73.4%
			Description of Sand & Gravel	Rounded <input checked="" type="checkbox"/> Angular <input checked="" type="checkbox"/>	
			Hard & Durable <input checked="" type="checkbox"/> Soft <input type="checkbox"/> Weathered & Friable <input type="checkbox"/>		

Organic Content				
D10 =	D30 =	D60 =	D50 =	D90 =

ASTM D 422: Particle Size Analysis of Soils

Hydrometer portion of test method not utilized.

ASTM D 421: Dry Preparation of Soil Samples

ASTM D 854: Specific Gravity of Soils

ASTM D 4318: Liquid Limit, Plastic Limit, &amp; Plastic Index of Soils

ASTM D 2487: Classification of Soils for Engineering Purposes (Unified Soil Classification System)

Technician Name:

Brian Urban

Certification #

Technical Responsibility:

Trapp Harris

Signature

Staff Professional

Position





## Liquid Limit, Plastic Limit, and Plastic Index

Project #: **1611-04-386**  
 Project Name: RBO South Fork Edisto River & Cedar Creek  
 Client Name: SCDOT  
 Client Address: P.O. Box 191, Columbia, South Carolina, 29202-0191

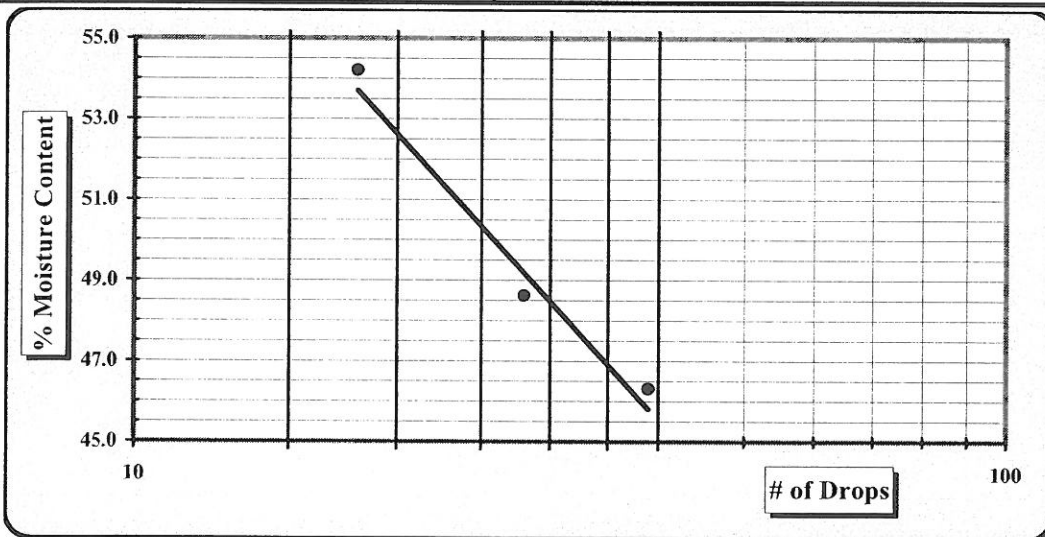
Report Date: 4/27/05  
 Test Date(s): 4/16/05-4/28/05

Boring #: 21 Sample #: 11 Sample Date: Various

Location: B-21 Elevation: 65.6'-67.1'

Sample Description: Elastic Silt w/ Sand (MH, A-7-5) medium plasticity, fine sand, light tan and purple

Pan #		Liquid Limit						Plastic Limit		
	Test #	1	2	3	4	5	6	1	2	3
	Tare #	145	116	126				136	104	
A	Tare Weight	13.63	13.67	13.77				13.74	13.70	
B	Wet Soil Weight + A	22.62	22.81	24.67				19.89	19.19	
C	Dry Soil Weight + A	19.46	19.82	21.22				18.45	17.88	
D	Water Weight (B-C)	3.16	2.99	3.45				1.44	1.31	
E	Dry Soil Weight (C-A)	5.83	6.15	7.45				4.71	4.18	
F	% Moisture Content (D/E)*100	54.2%	48.6%	46.3%				30.6%	31.3%	
N	# OF DROPS	18	28	39				Moisture Contents determined by ASTM D 2216		
LL	LL = F * FACTOR									
Ave.	Average							31.0%		



One Point Liquid Limit			
N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.990	29	1.018
24	0.995	30	1.022
25	1.000		

Notes:

### Special Sampling Methods:

Sample Preparation:	Wet Preparation <input type="checkbox"/>	Dry Preparation <input checked="" type="checkbox"/>	Air Dried <input checked="" type="checkbox"/>	NP, Non-Plastic <input type="checkbox"/>
Liquid limit Test:	Multipoint Method <input checked="" type="checkbox"/>	One-point Method <input type="checkbox"/>		Liquid Limit 50
Classification:	ASTM D 2487 <input type="checkbox"/>	AASHTO M 145 <input checked="" type="checkbox"/>		Plastic Limit 31
Liquid limit Test:	ASTM D 4318 <input type="checkbox"/>	AASHTO T 89 <input checked="" type="checkbox"/>		Plastic Index 19
Plastic limit Test:	ASTM D 4318 <input type="checkbox"/>	AASHTO T 90 <input checked="" type="checkbox"/>		Group Symbol A-7-5

Technician Name: Brian Urban

Certification #

Technical Responsibility: Trapp Harris

Signature

Staff Professional

Position

## Particle Size Analysis of Soils

ASTM D 422



Project #: 1611-04-386

Project Name: RBO South Fork Edisto River &amp; Cedar Creek

Client Name: SCDOT

Client Address: PO Box 191, Columbia, SC 29202-0191

Test Date(s): 4/13/05-4/28/05

Report Date: 5/1/05

Boring #: 22

Sample #: 5

Sample Date: Various

Location: B-22

Elevation: 33.5'-35.0'

Sample Description: Fat Clay w/ Sand (CH, A-7-6) high plasticity, fine to medium sand, light tan

Particle Size Analysis / Without Hydrometer Analysis			Moisture Content		Natural
	Tare Number	505.0	A	Tare #	505
A	Tare Weight	0.0	B	Tare Weight	0.00
B	Total Sample Dry Wt. + Tare Wt.	0.0	C	Wet Weight + Tare Wt.	165.23
C	Total Sample Dry Weight (B-A)	130.06	D	Dry Weight + Tare Wt.	130.06
D	Total Sample Wt. After #200 Wash	33.90	E	Water Wt. (B-C)	35.17
E	Percent Passing #200 (1-D/C)x100	73.9%		Dry Wt.(C-A)	130.06
				Moisture Content (100 x D/E) (%)	27.0%
Sieve Size (mm)	Sieve Size	Retained Weight	Percent Retained		Percent Passing Total Sample
37.50	1.5"	0.0	0.0%		100.0%
25.00	1.0"	0.00	0.0%		100.0%
19.00	3/4"	0.00	0.0%		100.0%
12.50	1/2"	0.00	0.0%		100.0%
9.50	3/8"	0.00	0.0%		100.0%
4.75	#4	0.00	0.0%		100.0%
2.36	#8	0.10	0.1%		99.9%
1.18	#16	4.10	3.2%		96.8%
0.60	#30	8.60	6.6%		90.2%
0.30	#50	4.80	3.7%		86.5%
0.15	#100	6.50	5.0%		81.5%
0.075	#200	9.80	7.5%		73.9%

<b>Notes:</b>		Maximum Particle Size	Gravel	< 75 mm and > 4.75 mm (#4)	0.0%
		Apparent Relative Density	Coarse Sand	< 4.75 mm and >2.00 mm (#10)	0.1%
Liquid Limit	72	Fineness Modulus	Medium Sand	< 2.00 mm and > 0.425 mm (#40)	9.8%
Plastic Limit	26	Cu = D60/D10:	Fine Sand	< 0.425 mm and > 0.075 mm (#200)	16.2%
Plastic Index	46	Cc =(D30) <sup>2</sup> / (D10xD60):	% Silt and Clay	< 0.075 mm	73.9%
			Description of Sand & Gravel	Rounded <input checked="" type="checkbox"/>	Angular <input checked="" type="checkbox"/>
			Hard & Durable <input checked="" type="checkbox"/>	Soft <input type="checkbox"/>	Weathered & Friable <input type="checkbox"/>
			Organic Content		

D10 =

D30 =

D60 =

D50 =

D90 =

ASTM D 422: Particle Size Analysis of Soils

Hydrometer portion of test method not utilized.

ASTM D 421: Dry Preparation of Soil Samples

ASTM D 854: Specific Gravity of Soils

ASTM D 4318: Liquid Limit, Plastic Limit, &amp; Plastic Index of Soils

ASTM D 2487: Classification of Soils for Engineering Purposes (Unified Soil Classification System)

Technician Name:

Brian Urban

Certification #

Technical Responsibility:

Trapp Harris

Signature

Staff Professional

Position



# Liquid Limit, Plastic Limit, and Plastic Index

Project #: **1611-04-386**  
 Project Name: RBO South Fork Edisto River & Cedar Creek  
 Client Name: SCDOT  
 Client Address: P.O. Box 191, Columbia, South Carolina, 29202-0191

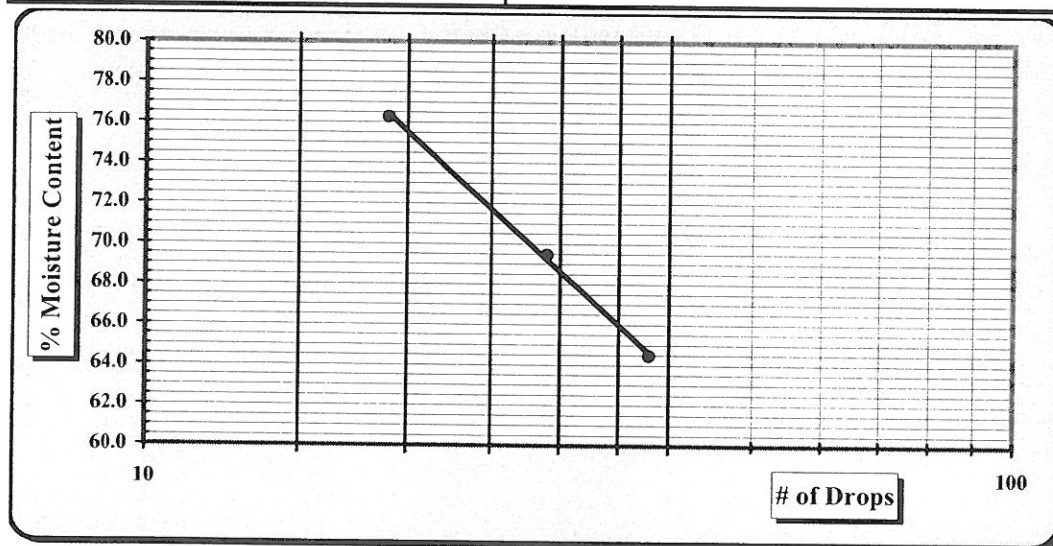
Report Date: 4/27/05  
 Test Date(s): 4/16/05-4/28/05

Boring #: 22 Sample #: 5 Sample Date: Various

Location: B-22 Elevation: 33.5'-35.'

Sample Description: Fat Clay w/ Sand (CH, A-7-6) high plasticity, fine to medium sand, light tan

Pan #		Liquid Limit						Plastic Limit		
	Test #	1	2	3	4	5	6	1	2	3
	Tare #	139	111	130				121	110	
A	Tare Weight	13.71	13.57	13.76				13.47	13.70	
B	Wet Soil Weight + A	23.88	22.50	22.51				18.31	18.63	
C	Dry Soil Weight + A	19.48	18.84	19.08				17.31	17.59	
D	Water Weight (B-C)	4.40	3.66	3.43				1.00	1.04	
E	Dry Soil Weight (C-A)	5.77	5.27	5.32				3.84	3.89	
F	% Moisture Content (D/E)*100	76.3%	69.4%	64.5%				26.0%	26.7%	
N	# OF DROPS	19	29	38				Moisture Contents determined by ASTM D 2216		
LL	LL = F * FACTOR									
Ave.	Average							26.4%		



One Point Liquid Limit			
N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.990	29	1.018
24	0.995	30	1.022
25	1.000		

Notes:

## Special Sampling Methods:

Sample Preparation:	Wet Preparation <input type="checkbox"/>	Dry Preparation <input checked="" type="checkbox"/>	Air Dried <input checked="" type="checkbox"/>	NP, Non-Plastic <input type="checkbox"/>
Liquid limit Test:	Multipoint Method <input checked="" type="checkbox"/>	One-point Method <input type="checkbox"/>		Liquid Limit <u>72</u>
Classification:	ASTM D 2487 <input type="checkbox"/>	AASHTO M 145 <input checked="" type="checkbox"/>		Plastic Limit <u>26</u>
Liquid limit Test:	ASTM D 4318 <input type="checkbox"/>	AASHTO T 89 <input checked="" type="checkbox"/>		Plastic Index <u>46</u>
Plastic limit Test:	ASTM D 4318 <input type="checkbox"/>	AASHTO T 90 <input checked="" type="checkbox"/>		Group Symbol <u>A-7-6</u>

Technician Name: Brian Urban

Certification #

Technical Responsibility: Trapp Harris

Signature

Staff Professional

Position



## Particle Size Analysis of Soils

ASTM D 422

**Project #:** 1611-04-386

**Project Name:** RBO South Fork Edisto River & Cedar Creek

**Client Name:** SCDOT

**Client Address:** PO Box 191, Columbia, SC 29202-0191

**Test Date(s):** 4/13/05-4/28/05

**Report Date:** 5/1/05

**Boring #:** 23

**Sample #:** 3

**Sample Date:** Various

**Location:** B-23

**Elevation:** 23.6'-25.1'

**Sample Description:** Silty Sand (SM, A-2-4) low plasticity, fine to medium sand, light brown to tan

Particle Size Analysis / Without Hydrometer Analysis			Moisture Content		Natural
				Tare #	506
	Tare Number	506.0	A	Tare Weight	0.00
A	Tare Weight	0.0	B	Wet Weight + Tare Wt.	147.06
B	Total Sample Dry Wt. + Tare Wt.	0.0	C	Dry Weight + Tare Wt.	118.22
C	Total Sample Dry Weight (B-A)	118.22	D	Water Wt. (B-C)	28.84
D	Total Sample Wt. After #200 Wash	91.10	E	Dry Wt.(C-A)	118.22
E	Percent Passing #200 (1-D/C)x100	22.9%	Moisture Content (100 x D/E) (%)		24.4%
Sieve Size (mm)	Sieve Size	Retained Weight	Percent Retained		Percent Passing Total Sample
37.50	1.5"	0.0	0.0%		100.0%
25.00	1.0"	0.00	0.0%		100.0%
19.00	3/4"	0.00	0.0%		100.0%
12.50	1/2"	0.00	0.0%		100.0%
9.50	3/8"	0.00	0.0%		100.0%
4.75	#4	0.00	0.0%		100.0%
2.36	#8	0.00	0.0%		100.0%
1.18	#16	1.30	1.1%		98.9%
0.60	#30	7.10	6.0%		92.9%
0.30	#50	16.80	14.2%		78.7%
0.15	#100	30.70	26.0%		52.7%
0.075	#200	35.20	29.8%		22.9%

<b>Notes:</b> Maximum Particle Size		Gravel	< 75 mm and > 4.75 mm (#4)	0.0%
Apparent Relative Density		Coarse Sand	< 4.75 mm and > 2.00 mm (#10)	0.0%
Liquid Limit	22	Medium Sand	< 2.00 mm and > 0.425 mm (#40)	7.1%
Plastic Limit	16	Fine Sand	< 0.425 mm and > 0.075 mm (#200)	70.0%
Plastic Index	6	% Silt and Clay	< 0.075 mm	22.9%
		Description of Sand & Gravel		
		Rounded <input checked="" type="checkbox"/> Angular <input checked="" type="checkbox"/>		
		Hard & Durable <input checked="" type="checkbox"/> Soft <input type="checkbox"/> Weathered & Friable <input type="checkbox"/>		

Organic Content				
D10 =	D30 =	D60 =	D50 =	D90 =

ASTM D 422: Particle Size Analysis of Soils

*Hydrometer portion of test method not utilized.*

ASTM D 421: Dry Preparation of Soil Samples

ASTM D 854: Specific Gravity of Soils

ASTM D 4318: Liquid Limit, Plastic Limit, &amp; Plastic Index of Soils

ASTM D 2487: Classification of Soils for Engineering Purposes (Unified Soil Classification System)

**Technician Name:**
Brian Urban

Certification #

**Technical Responsibility:**
Trapp Harris

Signature

**Staff Professional**

Position





## Liquid Limit, Plastic Limit, and Plastic Index

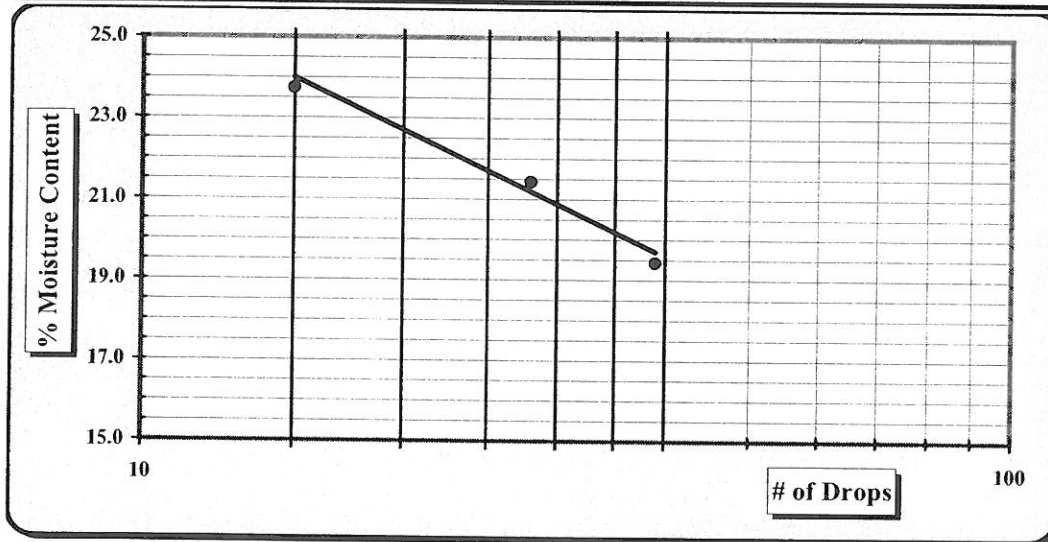
Project #: **1611-04-386**  
 Project Name: RBO South Fork Edisto River & Cedar Creek  
 Client Name: SCDOT  
 Client Address: P.O. Box 191, Columbia, South Carolina, 29202-0191  
 Boring #: 23 Sample #: 3

Report Date: 4/27/05  
 Test Date(s): 4/16/05-4/28/05

Location: B-23 Elevation: 23.6'-25.1'

Sample Description: Silty Sand (SM, A-2-4) low plasticity, fine to medium sand, light brown to tan

Pan #		Liquid Limit						Plastic Limit		
	Test #	1	2	3	4	5	6	1	2	3
	Tare #	138	115	137				133	110	
A	Tare Weight	13.85	13.79	13.73				13.78	13.76	
B	Wet Soil Weight + A	24.64	22.97	22.95				20.32	20.04	
C	Dry Soil Weight + A	22.57	21.35	21.45				19.43	19.18	
D	Water Weight (B-C)	2.07	1.62	1.50				0.89	0.86	
E	Dry Soil Weight (C-A)	8.72	7.56	7.72				5.65	5.42	
F	% Moisture Content (D/E)*100	23.7%	21.4%	19.4%				15.8%	15.9%	
N	# OF DROPS	15	28	39				Moisture Contents determined by ASTM D 2216		
LL	LL = F * FACTOR									
Ave.	Average							15.8%		



One Point Liquid Limit

N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.990	29	1.018
24	0.995	30	1.022
25	1.000		

Notes:

Special Sampling Methods:

Sample Preparation:	Wet Preparation <input type="checkbox"/>	Dry Preparation <input checked="" type="checkbox"/>	Air Dried <input checked="" type="checkbox"/>	NP, Non-Plastic <input type="checkbox"/>
Liquid limit Test:	Multipoint Method <input checked="" type="checkbox"/>	One-point Method <input type="checkbox"/>		Liquid Limit <u>22</u>
Classification:	ASTM D 2487 <input type="checkbox"/>	AASHTO M 145 <input checked="" type="checkbox"/>		Plastic Limit <u>16</u>
Liquid limit Test:	ASTM D 4318 <input type="checkbox"/>	AASHTO T 89 <input checked="" type="checkbox"/>		Plastic Index <u>6</u>
Plastic limit Test:	ASTM D 4318 <input type="checkbox"/>	AASHTO T 90 <input checked="" type="checkbox"/>		Group Symbol <u>A-2-4</u>

Technician Name: Brian Urban

Certification #

Technical Responsibility: Trapp Harris

Signature

Staff Professional

Position

## Particle Size Analysis of Soils

ASTM D 422



Project #: 1611-04-386

Project Name: RBO South Fork Edisto River &amp; Cedar Creek

Client Name: SCDOT

Client Address: PO Box 191, Columbia, SC 29202-0191

Test Date(s): 4/13/05-4/28/05

Report Date: 5/1/05

Boring #: 23

Sample #: 5

Sample Date: Various

Location: B-23

Elevation: 34.4'-35.9'

Sample Description: Clayey Sand (SC, A-7-6) medium plasticity, fine to medium sand, white and purple

Particle Size Analysis / Without Hydrometer Analysis			Moisture Content		Natural
				Tare #	507
	Tare Number	507.0	A	Tare Weight	0.00
A	Tare Weight	0.0	B	Wet Weight + Tare Wt.	160.26
B	Total Sample Dry Wt. + Tare Wt.	0.0	C	Dry Weight + Tare Wt.	131.80
C	Total Sample Dry Weight (B-A)	131.80	D	Water Wt. (B-C)	28.46
D	Total Sample Wt. After #200 Wash	93.30	E	Dry Wt.(C-A)	131.80
E	Percent Passing #200 (1-D/C)x100	29.2%	Moisture Content (100 x D/E) (%)		21.6%
Sieve Size (mm)	Sieve Size	Retained Weight	Percent Retained		Percent Passing Total Sample
37.50	1.5"	0.0	0.0%		100.0%
25.00	1.0"	0.00	0.0%		100.0%
19.00	3/4"	0.00	0.0%		100.0%
12.50	1/2"	0.00	0.0%		100.0%
9.50	3/8"	0.00	0.0%		100.0%
4.75	#4	0.00	0.0%		100.0%
2.36	#8	0.20	0.2%		99.8%
1.18	#16	8.60	6.5%		93.3%
0.60	#30	30.10	22.8%		70.5%
0.30	#50	37.30	28.3%		42.2%
0.15	#100	14.50	11.0%		31.2%
0.075	#200	2.60	2.0%		29.2%

<b>Notes:</b>		Maximum Particle Size	Gravel	< 75 mm and > 4.75 mm (#4)	0.0%
		Apparent Relative Density	Coarse Sand	< 4.75 mm and > 2.00 mm (#10)	0.2%
Liquid Limit	55	Fineness Modulus	Medium Sand	< 2.00 mm and > 0.425 mm (#40)	29.4%
Plastic Limit	23	Cu = D60/D10:	Fine Sand	< 0.425 mm and > 0.075 mm (#200)	41.3%
Plastic Index	32	Cc = (D30) <sup>2</sup> / (D10xD60):	% Silt and Clay	< 0.075 mm	29.2%
			Description of Sand & Gravel	Rounded <input checked="" type="checkbox"/>	Angular <input checked="" type="checkbox"/>
			Hard & Durable <input checked="" type="checkbox"/>	Soft <input type="checkbox"/>	Weathered & Friable <input type="checkbox"/>

Organic Content				
D10 =	D30 =	D60 =	D50 =	D90 =

ASTM D 422: Particle Size Analysis of Soils

Hydrometer portion of test method not utilized.

ASTM D 421: Dry Preparation of Soil Samples

ASTM D 854: Specific Gravity of Soils

ASTM D 4318: Liquid Limit, Plastic Limit, &amp; Plastic Index of Soils

ASTM D 2487: Classification of Soils for Engineering Purposes (Unified Soil Classification System)

Technician Name:

Brian Urban

Certification #

Technical Responsibility:

Trapp Harris

Signature

Staff Professional

Position



## Liquid Limit, Plastic Limit, and Plastic Index

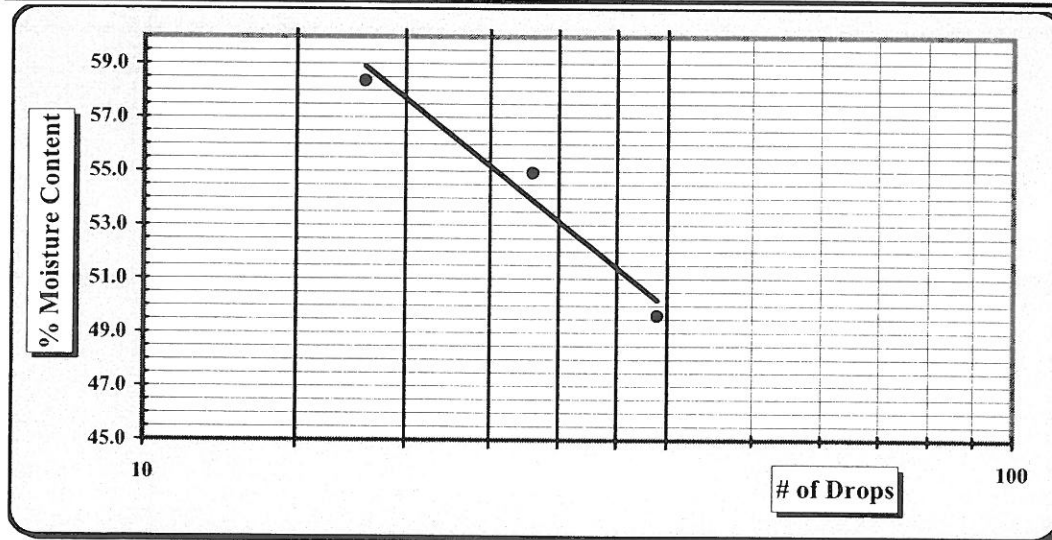
Project #: **1611-04-386**  
 Project Name: RBO South Fork Edisto River & Cedar Creek  
 Client Name: SCDOT  
 Client Address: P.O. Box 191, Columbia, South Carolina, 29202-0191  
 Boring #: 23 Sample #: 5

Report Date: 4/27/05  
 Test Date(s): 4/16/05-4/28/05

Location: B-23 Elevation: 34.4'-35.9'

Sample Description: Clayey Sand (SC, A-7-6) medium plasticity, fine to medium sand, white and purple

Pan #		Liquid Limit						Plastic Limit		
	Test #	1	2	3	4	5	6	1	2	3
	Tare #	8	29	3				j	m	
A	Tare Weight	14.25	14.27	14.60				11.72	11.47	
B	Wet Soil Weight + A	23.45	22.11	24.64				18.07	17.64	
C	Dry Soil Weight + A	20.06	19.33	21.31				16.89	16.48	
D	Water Weight (B-C)	3.39	2.78	3.33				1.18	1.16	
E	Dry Soil Weight (C-A)	5.81	5.06	6.71				5.17	5.01	
F	% Moisture Content (D/E)*100	58.3%	54.9%	49.6%				22.8%	23.2%	
N	# OF DROPS	18	28	39				Moisture Contents determined by ASTM D 2216		
LL	LL = F * FACTOR									
Ave.	Average							23.0%		



One Point Liquid Limit			
N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.990	29	1.018
24	0.995	30	1.022
25	1.000		

Notes:

### Special Sampling Methods:

Sample Preparation:	Wet Preparation <input type="checkbox"/>	Dry Preparation <input checked="" type="checkbox"/>	Air Dried <input checked="" type="checkbox"/>	NP, Non-Plastic <input type="checkbox"/>
Liquid limit Test:	Multipoint Method <input checked="" type="checkbox"/>	One-point Method <input type="checkbox"/>		Liquid Limit <u>55</u>
Classification:	ASTM D 2487 <input type="checkbox"/>	AASHTO M 145 <input checked="" type="checkbox"/>		Plastic Limit <u>23</u>
Liquid limit Test:	ASTM D 4318 <input type="checkbox"/>	AASHTO T 89 <input checked="" type="checkbox"/>		Plastic Index <u>32</u>
Plastic limit Test:	ASTM D 4318 <input type="checkbox"/>	AASHTO T 90 <input checked="" type="checkbox"/>		Group Symbol <u>A-7-6</u>

Technician Name: Brian Urban

Technical Responsibility: Trapp Harris

Certification #

Signature

Staff Professional

Position



## Particle Size Analysis of Soils

ASTM D 422

**Project #:** 1611-04-386

**Test Date(s):** 4-13-05/4/28/05

**Project Name:** RBO South Fork Edisto River & Cedar Creek

**Report Date:**
**Client Name:** SCDOT

**Client Address:** PO Box 191, Columbia, SC 29202-0191

**Boring #:** 23

**Sample #:** 6

**Sample Date:** Various

**Location:** B-23

**Elevation:** 39.4-40.9

**Sample Description:** Fat Clay w/ Sand (CH, A-7-6) medium plasticity, fine sand, white and red

Particle Size Analysis / Without Hydrometer Analysis			Moisture Content		Natural
				Tare #	24
	Tare Number	24.0	A	Tare Weight	0.00
A	Tare Weight	0.0	B	Wet Weight + Tare Wt.	168.82
B	Total Sample Dry Wt. + Tare Wt.	0.0	C	Dry Weight + Tare Wt.	133.21
C	Total Sample Dry Weight (B-A)	133.21	D	Water Wt. (B-C)	35.61
D	Total Sample Wt. After #200 Wash	25.10	E	Dry Wt.(C-A)	133.21
E	Percent Passing #200 (1-D/C)x100	81.2%	Moisture Content (100 x D/E) (%)		26.7%
Sieve Size (mm)	Sieve Size	Retained Weight	Percent Retained		Percent Passing Total Sample
37.50	1.5"	0.0	0.0%		100.0%
25.00	1.0"	0.00	0.0%		100.0%
19.00	3/4"	0.00	0.0%		100.0%
12.50	1/2"	0.00	0.0%		100.0%
9.50	3/8"	0.00	0.0%		100.0%
4.75	#4	0.90	0.7%		99.3%
2.36	#8	0.10	0.1%		99.2%
1.18	#16	0.20	0.2%		99.1%
0.60	#30	0.50	0.4%		98.7%
0.30	#50	1.90	1.4%		97.3%
0.15	#100	11.20	8.4%		88.9%
0.075	#200	10.30	7.7%		81.2%

<b>Notes:</b> Maximum Particle Size		Gravel	< 75 mm and > 4.75 mm (#4)	0.7%
Apparent Relative Density		Coarse Sand	< 4.75 mm and > 2.00 mm (#10)	0.1%
Liquid Limit	53	Medium Sand	< 2.00 mm and > 0.425 mm (#40)	0.5%
Plastic Limit	24	Fine Sand	< 0.425 mm and > 0.075 mm (#200)	17.6%
Plastic Index	29	% Silt and Clay	< 0.075 mm	81.2%
		Description of Sand & Gravel	Rounded <input checked="" type="checkbox"/> Angular <input checked="" type="checkbox"/>	
		Hard & Durable <input checked="" type="checkbox"/> Soft <input type="checkbox"/> Weathered & Friable <input type="checkbox"/>		

Organic Content

D10 =                      D30 =                      D60 =                      D50 =                      D90 =

ASTM D 422: Particle Size Analysis of Soils

*Hydrometer portion of test method not utilized.*

ASTM D 421: Dry Preparation of Soil Samples

ASTM D 854: Specific Gravity of Soils

ASTM D 4318: Liquid Limit, Plastic Limit, &amp; Plastic Index of Soils

ASTM D 2487: Classification of Soils for Engineering Purposes (Unified Soil Classification System)

**Technician Name:**
Brian Urban

Certification #

**Technical Responsibility:**
Trapp Harris

Signature

**Staff Professional**

Position





# Liquid Limit, Plastic Limit, and Plastic Index

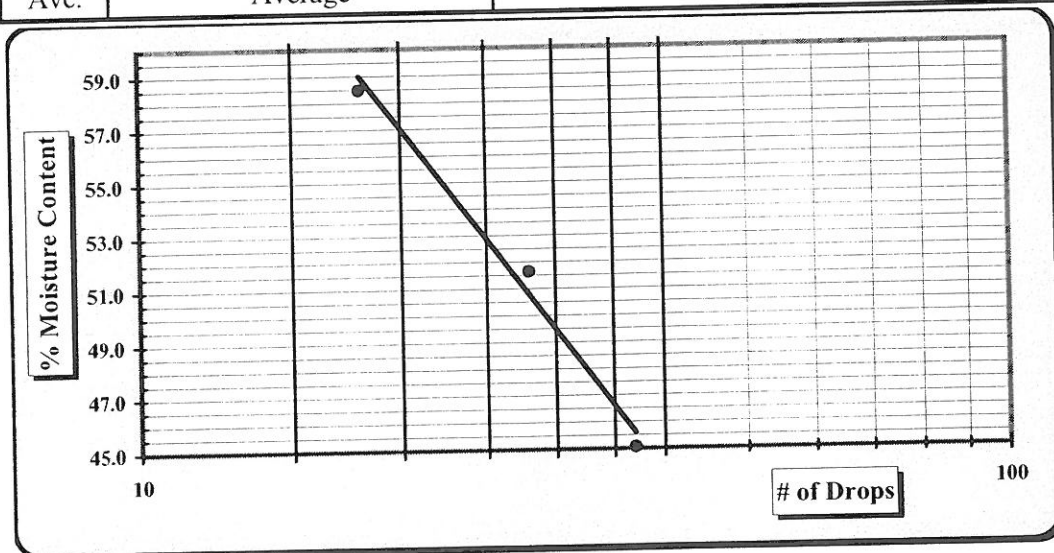
Project #: **1611-04-386**  
 Project Name: **RBO South Fork Edisto River & Cedar Creek**  
 Client Name: **SCDOT**  
 Client Address: **P.O. Box 191, Columbia, South Carolina, 29202-0191**  
 Boring #: **23** Sample #: **6**

Report Date: **4/27/05**  
 Test Date(s): **4/16/05-4/28/05**

Location: **B-23** Elevation: **39.4'-40.9'**

Sample Description: **Fat Clay w/ Sand (CH, A-7-6) medium plasticity, fine sand, white and red**

Pan #	Test #	Liquid Limit						Plastic Limit		
		1	2	3	4	5	6	1	2	3
	Tare #	117	105	134				120	122	
A	Tare Weight	13.78	13.63	13.73				13.64	13.72	
B	Wet Soil Weight + A	24.35	23.82	24.90				17.48	18.14	
C	Dry Soil Weight + A	20.45	20.35	21.43				16.72	17.28	
D	Water Weight (B-C)	3.90	3.47	3.47				0.76	0.86	
E	Dry Soil Weight (C-A)	6.67	6.72	7.70				3.08	3.56	
F	% Moisture Content (D/E)*100	58.5%	51.6%	45.1%				24.7%	24.2%	
N	# OF DROPS	18	28	37				Moisture Contents determined by ASTM D 2216		
LL	LL = F * FACTOR									
Ave.	Average							24.4%		



One Point Liquid Limit			
N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.990	29	1.018
24	0.995	30	1.022
25	1.000		

Notes:

## Special Sampling Methods:

Sample Preparation:	Wet Preparation <input type="checkbox"/>	Dry Preparation <input checked="" type="checkbox"/>	Air Dried <input checked="" type="checkbox"/>	NP, Non-Plastic <input type="checkbox"/>
Liquid limit Test:	Multipoint Method <input checked="" type="checkbox"/>	One-point Method <input type="checkbox"/>		Liquid Limit <u>53</u>
Classification:	ASTM D 2487 <input type="checkbox"/>	AASHTO M 145 <input checked="" type="checkbox"/>		Plastic Limit <u>24</u>
Liquid limit Test:	ASTM D 4318 <input type="checkbox"/>	AASHTO T 89 <input checked="" type="checkbox"/>		Plastic Index <u>29</u>
Plastic limit Test:	ASTM D 4318 <input type="checkbox"/>	AASHTO T 90 <input checked="" type="checkbox"/>		Group Symbol <u>A-7-6</u>

Technician Name: Brian Urban

Certification #

Technical Responsibility: Trapp Harris

Signature

Staff Professional

Position

## CPTU – PORE PRESSURE DISSIPATION TEST RESULTS



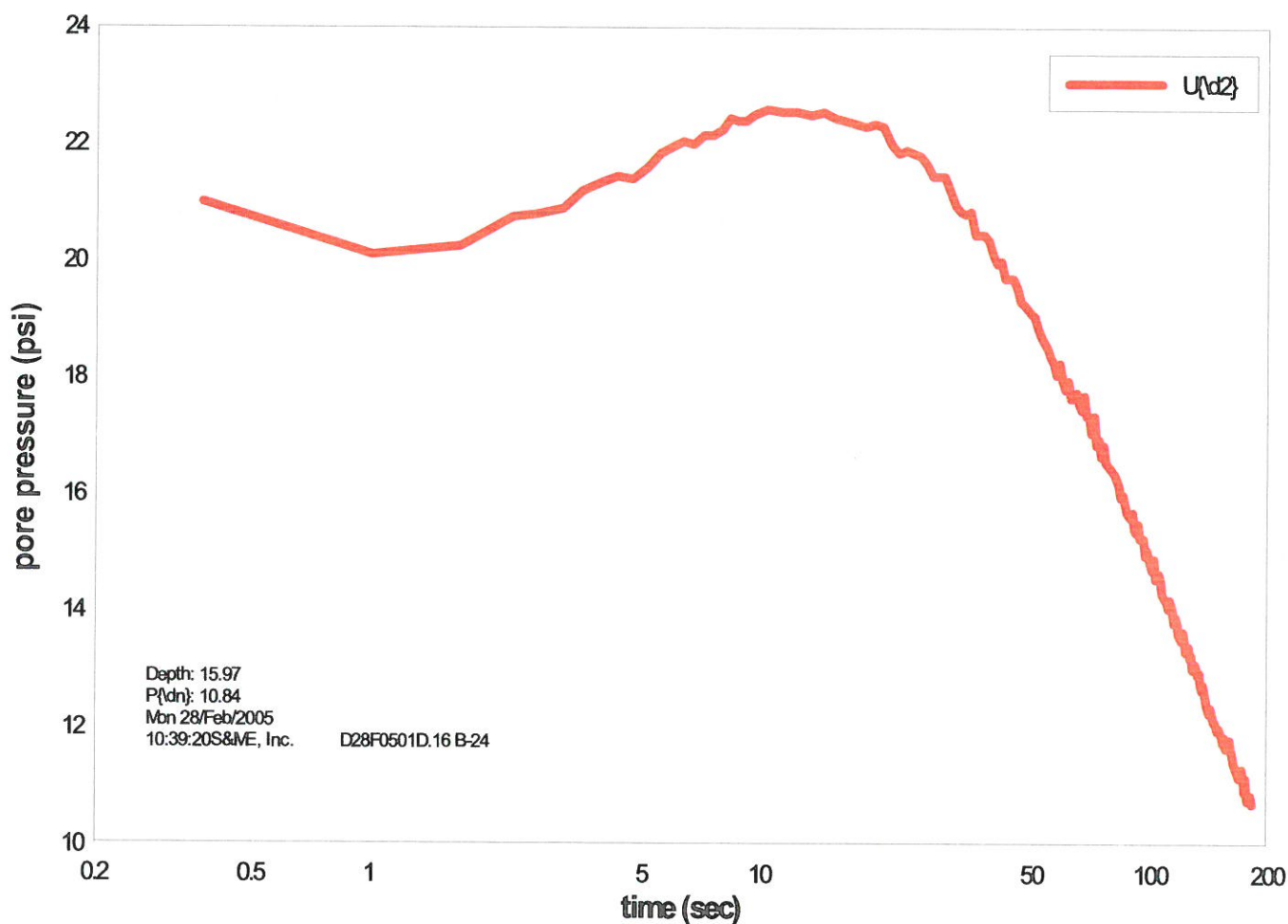
**Test ID:** B-24, 16ft  
**Site:** SC 4 Bridge over Edisto River  
**Location:** Aiken County, SC  
**Project:** 1611-05-386  
**Client:**

**Date:** February 28, 2005  
**Cone Id:** 2437.104, 15cm<sup>2</sup>

**Interpretation Assumptions:**

**GWT (ft):** 15  
**Depth (ft):** 16

Time (sec)	Pore Pressure (psi)	Time (sec)	Pore Pressure (psi)	Time (sec)	Pore Pressure (psi)	Time (sec)	Pore Pressure (psi)
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# CPTU – PORE PRESSURE DISSIPATION TEST RESULTS



Test ID: B-24, 16ft  
Site: SC 4 Bridge over Edisto River  
Location: Aiken County, SC  
Project: 1611-05-386  
Client:

Date: February 28, 2005  
Cone Id: 2437.104, 15cm<sup>2</sup>

## Interpretation Assumptions:

GWT (ft): 15  
Depth (ft): 16

Time (sec)	Pore Pressure (psi)	Time (sec)	Pore Pressure (psi)	Time (sec)	Pore Pressure (psi)	Time (sec)	Pore Pressure (psi)
0.371000	21.00230	41.25500	20.00363	95.25100	15.25992	149.2490	12.01422
1.000000	20.10344	42.24600	19.70392	96.25300	14.96021	150.2510	12.01422
1.681000	20.25330	43.24800	19.70392	97.25500	15.06002	151.2520	11.86436
2.285000	20.75263	44.24900	19.70392	98.24600	15.06002	152.2530	11.76455
2.648000	20.80267	45.25100	19.55433	99.24700	14.81062	153.2440	11.86436
3.083000	20.90249	46.25200	19.30466	100.2490	14.71054	154.2460	11.71451
3.453000	21.20193	47.25300	19.25462	101.2500	14.91043	155.2470	11.66473
3.883000	21.35179	48.25500	19.30466	102.2520	14.56068	156.2490	11.61469
4.257000	21.45160	49.24600	19.10477	103.2530	14.61072	157.2510	11.71451
4.665000	21.40183	50.24800	19.05499	104.2540	14.66076	158.2520	11.81432
5.066000	21.60146	51.24900	18.85510	105.2460	14.56068	159.2530	11.66473
5.477000	21.85113	52.25000	18.70524	106.2480	14.31128	160.2450	11.61469
5.863000	21.95094	53.25200	18.75528	107.2490	14.31128	161.2470	11.56465
6.271000	22.05102	54.25400	18.50561	108.2510	14.36105	162.2480	11.41506
6.664000	22.00098	55.25500	18.35576	109.2520	14.16142	163.2490	11.36503
7.057000	22.15083	56.24600	18.25594	110.2540	14.06134	164.2510	11.31499
7.458000	22.15083	57.25000	18.05631	111.2550	14.21120	165.2530	11.31499
7.887000	22.25065	58.24900	18.25594	112.2460	14.11138	166.2540	11.31499
8.261000	22.45028	59.25100	17.95624	113.2470	14.01157	167.2450	11.16540
8.654000	22.40050	60.25600	17.80665	114.2490	13.81194	168.2460	11.26521
9.053000	22.40050	61.25400	17.95624	115.2500	13.91176	169.2480	11.26521
9.458000	22.50032	62.25500	17.65679	116.2520	13.81194	170.2500	11.31499
9.868000	22.55036	63.24500	17.65679	117.2530	13.61205	171.2510	11.31499
10.26600	22.60013	64.24700	17.75661	118.2540	13.66209	172.2520	11.11536
11.25300	22.55036	65.24900	17.55698	119.2460	13.51223	173.2540	10.91573
12.25200	22.55036	66.25000	17.45690	120.2480	13.66209	174.2440	11.16540
13.25400	22.50032	67.25100	17.70657	121.2490	13.51223	175.2460	10.86569
14.24500	22.55036	68.25300	17.35708	122.2500	13.31260	176.2480	10.76587
15.24700	22.45028	69.25400	17.35708	123.2520	13.31260	177.2490	10.71583
16.24800	22.40050	70.24500	17.05764	124.2540	13.41242	178.2510	10.81565
17.24900	22.35046	71.24700	17.35708	125.2550	13.21252	179.2530	10.86569
18.25100	22.30069	72.24900	16.85774	126.2460	13.26256	180.2540	10.86569
19.25200	22.35046	73.25000	16.95756	127.2470	13.01289	181.2450	10.71583
20.25400	22.30069	74.25100	16.65811	128.2490	13.01289	182.2480	10.71583
21.24500	22.00098	75.25200	16.85774	129.2510	13.11271		
22.24700	21.85113	76.25400	16.55830	130.2520	13.11271		
23.24800	21.90116	77.24600	16.50826	131.2530	12.91308		
24.25000	21.85113	78.24700	16.50826	132.2440	12.96285		
25.25100	21.80135	79.24900	16.40845	133.2460	12.76322		
26.25200	21.65150	80.25000	16.35841	134.2480	12.66341		
27.25400	21.45160	81.25200	16.25859	135.2490	12.76322		
28.24500	21.45160	82.25700	16.15878	136.2500	12.76322		
29.24700	21.45160	83.25500	15.95888	137.2520	12.51356		
30.24800	21.20193	84.24500	16.00892	138.2540	12.41374		
31.25000	20.95226	85.24700	15.85907	139.2450	12.41374		
32.25100	20.85245	86.24800	15.70921	140.2460	12.26389		
33.25300	20.80267	87.25600	15.75925	141.2480	12.36370		
34.25400	20.85245	88.25300	15.60940	142.2490	12.36370		
35.24600	20.45293	89.25300	15.70921	143.2510	12.31366		
36.24700	20.45293	90.25400	15.40977	144.2520	12.11403		
37.24900	20.45293	91.24500	15.35973	145.2540	12.11403		
38.25100	20.35311	92.24700	15.50958	146.2440	12.06399		
39.25200	20.10344	93.24900	15.25992	147.2460	11.96418		
40.25300	19.95359	94.25000	15.20988	148.2480	12.01422		





# Particle Size Analysis of Soils

ASTM D 422

Project #: 1611-04-386

Project Name: RBO South Fork Edisto River &amp; Cedar Creek

Client Name: SCDOT

Client Address: PO Box 191, Columbia, SC 29202-0191

Test Date(s): 4-13-05/4/28/05

Report Date:

Boring #: 25

Sample #: 2

Sample Date:

Various

Location: B-25

Elevation:

3.5-5.0

Sample Description: Silty Sand (SM, A-2-4) low plasticity, fine to medium sand, orange and brown

Particle Size Analysis / Without Hydrometer Analysis			Moisture Content		Natural
				Tare #	26
	Tare Number	26.0	A	Tare Weight	0.00
A	Tare Weight	0.0	B	Wet Weight + Tare Wt.	115.13
B	Total Sample Dry Wt. + Tare Wt.	0.0	C	Dry Weight + Tare Wt.	110.33
C	Total Sample Dry Weight (B-A)	110.33	D	Water Wt. (B-C)	4.80
D	Total Sample Wt. After #200 Wash	93.50	E	Dry Wt.(C-A)	110.33
E	Percent Passing #200 (1-D/C)x100	15.3%	Moisture Content (100 x D/E) (%)		4.4%
Sieve Size (mm)	Sieve Size	Retained Weight	Percent Retained		Percent Passing Total Sample
37.50	1.5"	0.0	0.0%		100.0%
25.00	1.0"	0.00	0.0%		100.0%
19.00	3/4"	0.00	0.0%		100.0%
12.50	1/2"	0.00	0.0%		100.0%
9.50	3/8"	0.00	0.0%		100.0%
4.75	#4	1.80	1.6%		98.4%
2.36	#8	2.80	2.5%		95.8%
1.18	#16	12.20	11.1%		84.8%
0.60	#30	26.10	23.7%		61.1%
0.30	#50	28.00	25.4%		35.7%
0.15	#100	15.20	13.8%		22.0%
0.075	#200	7.40	6.7%		15.3%

<b>Notes:</b>		Maximum Particle Size	Gravel	< 75 mm and > 4.75 mm (#4)	1.6%
		Apparent Relative Density	Coarse Sand	< 4.75 mm and > 2.00 mm (#10)	2.5%
Liquid Limit	22	Fineness Modulus	Medium Sand	< 2.00 mm and > 0.425 mm (#40)	34.7%
Plastic Limit	15	Cu = D60/D10:	Fine Sand	< 0.425 mm and > 0.075 mm (#200)	45.9%
Plastic Index	7	Cc = (D30) <sup>2</sup> / (D10xD60):	% Silt and Clay	< 0.075 mm	15.3%
			Description of Sand & Gravel	Rounded <input checked="" type="checkbox"/>	Angular <input checked="" type="checkbox"/>
			Hard & Durable <input checked="" type="checkbox"/>	Soft <input type="checkbox"/>	Weathered & Friable <input type="checkbox"/>

Organic Content

D10 =

D30 =

D60 =

D50 =

D90 =

ASTM D 422: Particle Size Analysis of Soils

Hydrometer portion of test method not utilized.

ASTM D 421: Dry Preparation of Soil Samples

ASTM D 854: Specific Gravity of Soils

ASTM D 4318: Liquid Limit, Plastic Limit, &amp; Plastic Index of Soils

ASTM D 2487: Classification of Soils for Engineering Purposes (Unified Soil Classification System)

Technician Name:

Brian Urban

Certification #

Technical Responsibility:

Trapp Harris

Signature

Staff Professional

Position





## Liquid Limit, Plastic Limit, and Plastic Index

Project #: **1611-04-386**  
 Project Name: RBO South Fork Edisto River & Cedar Creek  
 Client Name: SCDOT  
 Client Address: P.O. Box 191, Columbia, South Carolina, 29202-0191  
 Boring #: 25 Sample #: 2

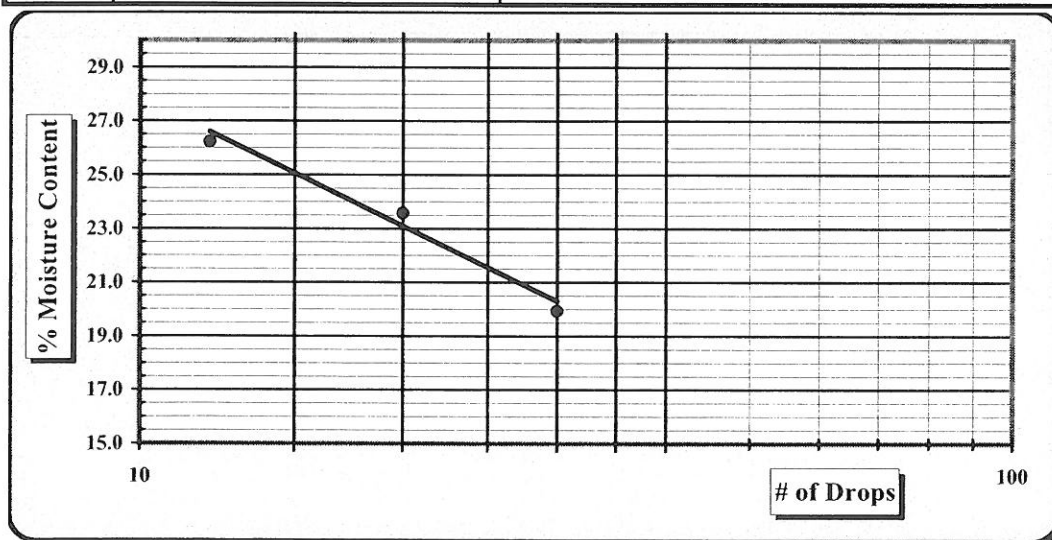
Report Date: 4/26/05  
 Test Date(s): 4/16/05-4/28/05

Sample Date: Various

Location: B-25 Elevation: 3.5'-5.0'

Sample Description: Silty Sand (SM, A-2-4) low plasticity, fine to medium sand, orange and brown

Pan #		Liquid Limit						Plastic Limit		
	Test #	1	2	3	4	5	6	1	2	3
	Tare #	123	142	119				140		
A	Tare Weight	13.74	13.72	13.58				13.67		
B	Wet Soil Weight + A	18.94	20.85	20.80				16.43		
C	Dry Soil Weight + A	17.86	19.49	19.60				16.08		
D	Water Weight (B-C)	1.08	1.36	1.20				0.35		
E	Dry Soil Weight (C-A)	4.12	5.77	6.02				2.41		
F	% Moisture Content (D/E)*100	26.2%	23.6%	19.9%				14.5%		
N	# OF DROPS	12	20	30				Moisture Contents determined by ASTM D 2216		
LL	LL = F * FACTOR									
Ave.	Average							14.5%		



One Point Liquid Limit			
N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.990	29	1.018
24	0.995	30	1.022
25	1.000		

Notes:

### Special Sampling Methods:

Sample Preparation:	Wet Preparation <input type="checkbox"/>	Dry Preparation <input checked="" type="checkbox"/>	Air Dried <input checked="" type="checkbox"/>	NP, Non-Plastic <input type="checkbox"/>
Liquid limit Test:	Multipoint Method <input checked="" type="checkbox"/>	One-point Method <input type="checkbox"/>		Liquid Limit <u>22</u>
Classification:	ASTM D 2487 <input type="checkbox"/>	AASHTO M 145 <input checked="" type="checkbox"/>		Plastic Limit <u>15</u>
Liquid limit Test:	ASTM D 4318 <input type="checkbox"/>	AASHTO T 89 <input checked="" type="checkbox"/>		Plastic Index <u>7</u>
Plastic limit Test:	ASTM D 4318 <input type="checkbox"/>	AASHTO T 90 <input checked="" type="checkbox"/>		Group Symbol <u>A-2-4</u>

Technician Name: Brian Urban

Certification #

Technical Responsibility: Trapp Harris

Signature

Staff Professional

Position



# Particle Size Analysis of Soils

ASTM D 422

Project #: 1611-04-386

Project Name: RBO South Fork Edisto River &amp; Cedar Creek

Client Name: SCDOT

Client Address: PO Box 191, Columbia, SC 29202-0191

Test Date(s):

4-13-05/4/28/05

Report Date:

Boring #: 26

Sample #: 3

Sample Date:

Various

Location: B-26

Elevation:

6.0-7.5

Sample Description: Clayey Sand (SC, A-2-6) low plasticity, fine to medium sand, light brown and orange

Particle Size Analysis / Without Hydrometer Analysis			Moisture Content		Natural
				Tare #	41
	Tare Number	41.0	A	Tare Weight	0.00
A	Tare Weight	0.0	B	Wet Weight + Tare Wt.	135.33
B	Total Sample Dry Wt. + Tare Wt.	0.0	C	Dry Weight + Tare Wt.	121.34
C	Total Sample Dry Weight (B-A)	121.34	D	Water Wt. (B-C)	13.99
D	Total Sample Wt. After #200 Wash	88.40	E	Dry Wt.(C-A)	121.34
E	Percent Passing #200 (1-D/C)x100	27.1%	Moisture Content (100 x D/E) (%)		11.5%
Sieve Size (mm)	Sieve Size	Retained Weight	Percent Retained		Percent Passing Total Sample
37.50	1.5"	0.0	0.0%		100.0%
25.00	1.0"	0.00	0.0%		100.0%
19.00	3/4"	0.00	0.0%		100.0%
12.50	1/2"	0.00	0.0%		100.0%
9.50	3/8"	0.00	0.0%		100.0%
4.75	#4	0.00	0.0%		100.0%
2.36	#8	0.50	0.4%		99.6%
1.18	#16	3.80	3.1%		96.5%
0.60	#30	12.10	10.0%		86.5%
0.30	#50	24.40	20.1%		66.4%
0.15	#100	30.20	24.9%		41.5%
0.075	#200	17.40	14.3%		27.1%

<b>Notes:</b>		Maximum Particle Size	Gravel	< 75 mm and > 4.75 mm (#4)	0.0%
		Apparent Relative Density	Coarse Sand	< 4.75 mm and > 2.00 mm (#10)	0.4%
Liquid Limit	33	Fineness Modulus	Medium Sand	< 2.00 mm and > 0.425 mm (#40)	13.1%
Plastic Limit	17	Cu = D60/D10:	Fine Sand	< 0.425 mm and > 0.075 mm (#200)	59.3%
Plastic Index	16	Cc = (D30) <sup>2</sup> / (D10xD60):	% Silt and Clay	< 0.075 mm	27.1%
			Description of Sand & Gravel	Rounded <input checked="" type="checkbox"/>	Angular <input checked="" type="checkbox"/>
			Hard & Durable <input checked="" type="checkbox"/>	Soft <input type="checkbox"/>	Weathered & Friable <input type="checkbox"/>

Organic Content

D10 =

D30 =

D60 =

D50 =

D90 =

ASTM D 422: Particle Size Analysis of Soils

Hydrometer portion of test method not utilized.

ASTM D 421: Dry Preparation of Soil Samples

ASTM D 854: Specific Gravity of Soils

ASTM D 4318: Liquid Limit, Plastic Limit, &amp; Plastic Index of Soils

ASTM D 2487: Classification of Soils for Engineering Purposes (Unified Soil Classification System)

Technician Name:

Brian Urban

Certification #

Technical Responsibility:

Trapp Harris

Signature

Staff Professional

Position



# Liquid Limit, Plastic Limit, and Plastic Index

Project #: **1611-04-386**  
 Project Name: **RBO South Fork Edisto River & Cedar Creek**  
 Client Name: **SCDOT**  
 Client Address: **P.O. Box 191, Columbia, South Carolina, 29202-0191**  
 Boring #: **26** Sample #: **3**

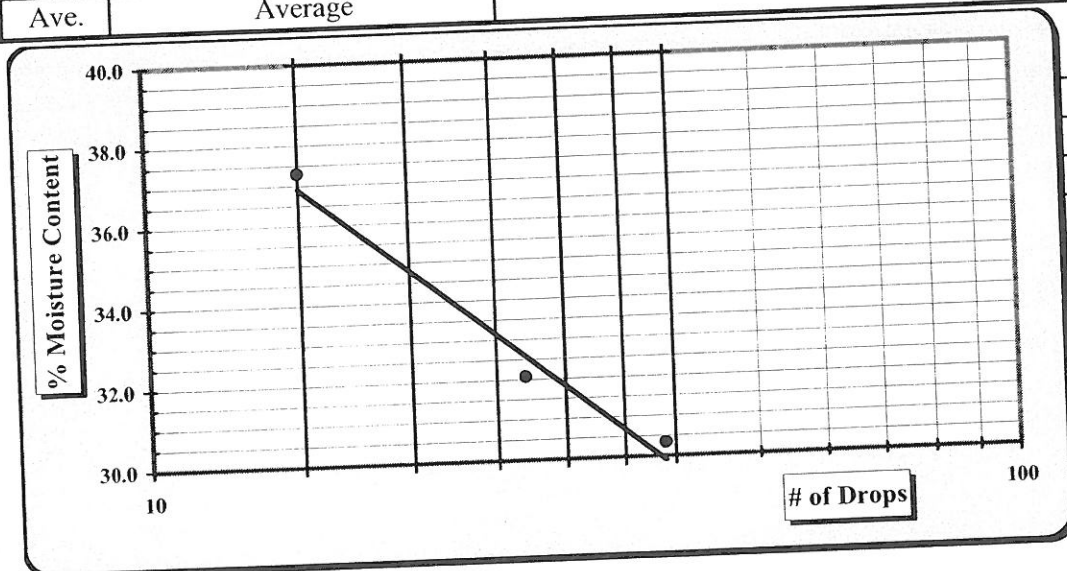
Report Date: **4/27/05**  
 Test Date(s): **4/16/05-4/28/05**

Elevation: **6.0'-7.5'**

Location: **B-26**

Sample Description: **Clayey Sand (SC, A-2-6) medium plasticity, fine to medium sand, light brown and**

Pan #	Test #	Liquid Limit						Plastic Limit		
		1	2	3	4	5	6	1	2	3
	Tare #	141	143	146				103	147	
	Tare Weight	13.56	13.71	13.51				13.99	13.56	
A								18.92	18.63	
B	Wet Soil Weight + A	24.31	23.43	23.22				18.21	17.91	
C	Dry Soil Weight + A	21.39	21.07	20.96				0.71	0.72	
D	Water Weight (B-C)	2.92	2.36	2.26				4.22	4.35	
E	Dry Soil Weight (C-A)	7.83	7.36	7.45				16.8%	16.6%	
F	% Moisture Content (D/E)*100	37.3%	32.1%	30.3%				Moisture Contents determined by ASTM D 2216		
N	# OF DROPS	15	27	39						
LL	LL = F * FACTOR							16.7%		
Ave.	Average									



One Point Liquid Limit			
N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.990	29	1.018
24	0.995	30	1.022
25	1.000		

Notes:

Special Sampling Methods:

Sample Preparation: Wet Preparation ☐ Dry Preparation ☒ Air Dried ☒  
 Liquid limit Test: Multipoint Method ☒ One-point Method ☐  
 Classification: ASTM D 2487 ☐ AASHTO M 145 ☒  
 Liquid limit Test: ASTM D 4318 ☐ AASHTO T 89 ☒  
 Plastic limit Test: ASTM D 4318 ☐ AASHTO T 90 ☒

NP, Non-Plastic ☐  
 Liquid Limit 33  
 Plastic Limit 17  
 Plastic Index 16  
 Group Symbol A-2-6

Technician Name: Brian Urban

Certification #

Technical Responsibility: Trapp Harris

Signature

Staff Professional  
Position



# Particle Size Analysis of Soils

ASTM D 422

Project #: 1611-04-386

Project Name: RBO South Fork Edisto River &amp; Cedar Creek

Client Name: SCDOT

Client Address: PO Box 191, Columbia, South Carolina, 29202-0191

Test Date(s): 4/13/05-4/28/05

Report Date: 5/1/05

Boring #: 27

Sample #: 3

Sample Date: Various

Location: B-27

Elevation: 6.0'-7.5'

Sample Description: Sandy Silt (ML, A-4) low plasticity, fine to medium sand, tan and yellow

Particle Size Analysis / Without Hydrometer Analysis			Moisture Content		Natural
				Tare #	213
	Tare Number	213.0	A	Tare Weight	0.00
A	Tare Weight	0.0	B	Wet Weight + Tare Wt.	154.93
B	Total Sample Dry Wt. + Tare Wt.	0.0	C	Dry Weight + Tare Wt.	126.34
C	Total Sample Dry Weight (B-A)	126.34	D	Water Wt. (B-C)	28.59
D	Total Sample Wt. After #200 Wash	48.10	E	Dry Wt.(C-A)	126.34
E	Percent Passing #200 (1-D/C)x100	61.9%	Moisture Content (100 x D/E) (%)		22.6%
Sieve Size (mm)	Sieve Size	Retained Weight	Percent Retained		Percent Passing Total Sample
37.50	1.5"	0.0	0.0%		100.0%
25.00	1.0"	0.00	0.0%		100.0%
19.00	3/4"	0.00	0.0%		100.0%
12.50	1/2"	0.00	0.0%		100.0%
9.50	3/8"	0.00	0.0%		100.0%
4.75	#4	0.90	0.7%		99.3%
2.36	#8	3.10	2.5%		96.8%
1.18	#16	6.00	4.7%		92.1%
0.60	#30	10.40	8.2%		83.9%
0.30	#50	15.80	12.5%		71.3%
0.15	#100	10.70	8.5%		62.9%
0.075	#200	1.20	0.9%		61.9%

<b>Notes:</b>		Maximum Particle Size	Gravel	< 75 mm and > 4.75 mm (#4)	0.7%
		Apparent Relative Density	Coarse Sand	< 4.75 mm and > 2.00 mm (#10)	2.5%
Liquid Limit	17	Fineness Modulus	Medium Sand	< 2.00 mm and > 0.425 mm (#40)	13.0%
Plastic Limit	15	Cu = D60/D10:	Fine Sand	< 0.425 mm and > 0.075 mm (#200)	21.9%
Plastic Index	2	Cc = (D30) <sup>2</sup> / (D10 x D60):	% Silt and Clay	< 0.075 mm	61.9%
			Description of Sand & Gravel	Rounded <input checked="" type="checkbox"/> Angular <input checked="" type="checkbox"/>	
			Hard & Durable <input checked="" type="checkbox"/> Soft <input type="checkbox"/>	Weathered & Friable <input type="checkbox"/>	

Organic Content

D10 =

D30 =

D60 =

D50 =

D90 =

ASTM D 422: Particle Size Analysis of Soils

Hydrometer portion of test method not utilized.

ASTM D 421: Dry Preparation of Soil Samples

ASTM D 854: Specific Gravity of Soils

ASTM D 4318: Liquid Limit, Plastic Limit, &amp; Plastic Index of Soils

ASTM D 2487: Classification of Soils for Engineering Purposes (Unified Soil Classification System)

Technician Name:

Brian Urban

Certification #

Technical Responsibility:

Trapp Harris

Signature

Staff Professional

Position





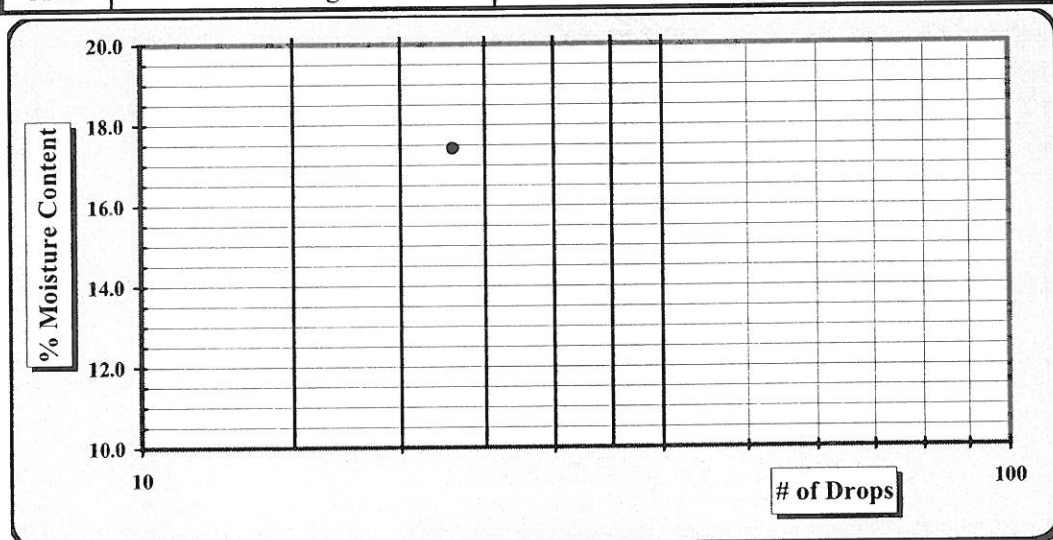
## Liquid Limit, Plastic Limit, and Plastic Index

Project #: **1611-04-386**  
 Project Name: **RBO South Fork Edisto River & Cedar Creek**  
 Client Name: **SCDOT**  
 Client Address: **P.O. Box 191, Columbia, South Carolina, 29202-0191**  
 Boring #: **27** Sample #: **3**

Report Date: **4/27/05**  
 Test Date(s): **4/16/05-4/28/05**

Location: **B-27** Elevation: **6.0'-7.5'**  
 Sample Description: **Sandy Silt (ML, A-4) low plasticity, fine to medium sand, tan and yellow**

Pan #	Test #	Liquid Limit						Plastic Limit		
		1	2	3	4	5	6	1	2	3
	Tare #		137					138	116	
A	Tare Weight		13.70					13.82	13.64	
B	Wet Soil Weight + A		21.05					18.06	18.39	
C	Dry Soil Weight + A		19.96					17.48	17.77	
D	Water Weight (B-C)		1.09					0.58	0.62	
E	Dry Soil Weight (C-A)		6.26					3.66	4.13	
F	% Moisture Content (D/E)*100		17.4%					15.8%	15.0%	
N	# OF DROPS		23					Moisture Contents determined by ASTM D 2216		
LL	LL = F * FACTOR		16.8%							
Ave.	Average							15.4%		



One Point Liquid Limit			
N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.990	29	1.018
24	0.995	30	1.022
25	1.000		

Notes:

### Special Sampling Methods:

Sample Preparation:	Wet Preparation <input type="checkbox"/>	Dry Preparation <input checked="" type="checkbox"/>	Air Dried <input checked="" type="checkbox"/>	NP, Non-Plastic <input type="checkbox"/>
Liquid limit Test:	Multipoint Method <input checked="" type="checkbox"/>	One-point Method <input type="checkbox"/>		Liquid Limit <u>17</u>
Classification:	ASTM D 2487 <input type="checkbox"/>	AASHTO M 145 <input checked="" type="checkbox"/>		Plastic Limit <u>15</u>
Liquid limit Test:	ASTM D 4318 <input type="checkbox"/>	AASHTO T 89 <input checked="" type="checkbox"/>		Plastic Index <u>2</u>
Plastic limit Test:	ASTM D 4318 <input type="checkbox"/>	AASHTO T 90 <input checked="" type="checkbox"/>		Group Symbol <u>A-2-4</u>

Technician Name: Brian Urban

Certification #

Technical Responsibility: Trapp Harris

Signature

Staff Professional

Position



# Particle Size Analysis of Soils

ASTM D 422

Project #: 1611-04-386

Project Name: RBO South Fork Edisto River &amp; Cedar Creek

Client Name: SCDOT

Client Address: PO Box 191, Columbia, SC 29202-0191

Test Date(s): 4/13/05-4/28/05

Report Date: 5/1/05

Boring #: 28

Sample #: 2

Sample Date: Various

Location: B-28

Elevation: 3.5-5.0

Sample Description: Clayey Sand (SC, A-2-4) low plasticity, fine to medium sand, brown

Particle Size Analysis / Without Hydrometer Analysis			Moisture Content		Natural
				Tare #	211
	Tare Number	211.0	A	Tare Weight	0.00
A	Tare Weight	0.0	B	Wet Weight + Tare Wt.	176.90
B	Total Sample Dry Wt. + Tare Wt.	0.0	C	Dry Weight + Tare Wt.	153.30
C	Total Sample Dry Weight (B-A)	153.30	D	Water Wt. (B-C)	23.60
D	Total Sample Wt. After #200 Wash	134.90	E	Dry Wt.(C-A)	153.30
E	Percent Passing #200 (1-D/C)x100	12.0%	Moisture Content (100 x D/E) (%)		15.4%
Sieve Size (mm)	Sieve Size	Retained Weight	Percent Retained		Percent Passing Total Sample
37.50	1.5"	0.0	0.0%		100.0%
25.00	1.0"	0.00	0.0%		100.0%
19.00	3/4"	0.00	0.0%		100.0%
12.50	1/2"	0.00	0.0%		100.0%
9.50	3/8"	0.00	0.0%		100.0%
4.75	#4	7.00	4.6%		95.4%
2.36	#8	4.80	3.1%		92.3%
1.18	#16	24.30	15.9%		76.5%
0.60	#30	41.60	27.1%		49.3%
0.30	#50	29.30	19.1%		30.2%
0.15	#100	17.60	11.5%		18.7%
0.075	#200	10.30	6.7%		12.0%

<b>Notes:</b>		Maximum Particle Size	Gravel	< 75 mm and > 4.75 mm (#4)	4.6%
		Apparent Relative Density	Coarse Sand	< 4.75 mm and > 2.00 mm (#10)	3.1%
Liquid Limit	23	Fineness Modulus	Medium Sand	< 2.00 mm and > 0.425 mm (#40)	43.0%
Plastic Limit	14	Cu = D60/D10:	Fine Sand	< 0.425 mm and > 0.075 mm (#200)	37.3%
Plastic Index	9	Cc = (D30) <sup>2</sup> / (D10 x D60):	% Silt and Clay	< 0.075 mm	12.0%
		Description of Sand & Gravel		Rounded <input checked="" type="checkbox"/>	Angular <input checked="" type="checkbox"/>
		Hard & Durable <input checked="" type="checkbox"/>		Soft <input type="checkbox"/>	Weathered & Friable <input type="checkbox"/>

Organic Content

D10 =

D30 =

D60 =

D50 =

D90 =

ASTM D 422: Particle Size Analysis of Soils

Hydrometer portion of test method not utilized.

ASTM D 421: Dry Preparation of Soil Samples

ASTM D 854: Specific Gravity of Soils

ASTM D 4318: Liquid Limit, Plastic Limit, &amp; Plastic Index of Soils

ASTM D 2487: Classification of Soils for Engineering Purposes (Unified Soil Classification System)

Technician Name:

Brian Urban

Certification #

Technical Responsibility:

Trapp Harris

Signature

Staff Professional

Position



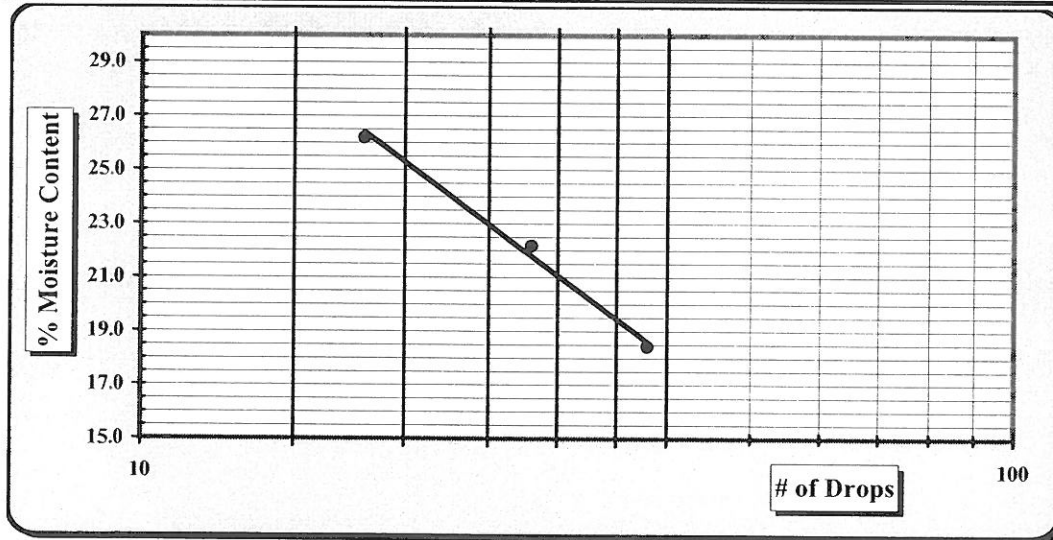
## Liquid Limit, Plastic Limit, and Plastic Index

Project #: **1611-04-386**  
 Project Name: **RBO South Fork Edisto River & Cedar Creek**  
 Client Name: **SCDOT**  
 Client Address: **P.O. Box 191, Columbia, South Carolina, 29202-0191**  
 Boring #: **28** Sample #: **2**

Report Date: **4/27/05**  
 Test Date(s): **4/16/05-4/28/05**

Location: **B-28** Elevation: **3.5'-5.0'**  
 Sample Description: **Clayey Sand (SC, A-2-4) low plasticity, fine to medium sand, brown**

Pan #		Liquid Limit						Plastic Limit		
	Test #	1	2	3	4	5	6	1	2	3
	Tare #	22	21	72				7	y3	
A	Tare Weight	0.99	0.99	0.99				0.99	0.99	
B	Wet Soil Weight + A	9.52	8.54	7.16				3.79	4.36	
C	Dry Soil Weight + A	7.75	7.17	6.20				3.45	3.94	
D	Water Weight (B-C)	1.77	1.37	0.96				0.34	0.42	
E	Dry Soil Weight (C-A)	6.76	6.18	5.21				2.46	2.95	
F	% Moisture Content (D/E)*100	26.2%	22.2%	18.4%				13.8%	14.2%	
N	# OF DROPS	18	28	38				Moisture Contents determined by ASTM D 2216		
LL	LL = F * FACTOR									
Ave.	Average							14.0%		



One Point Liquid Limit			
N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.990	29	1.018
24	0.995	30	1.022
25	1.000		

Notes:

## Special Sampling Methods:

Sample Preparation:	Wet Preparation <input type="checkbox"/>	Dry Preparation <input checked="" type="checkbox"/>	Air Dried <input checked="" type="checkbox"/>	NP, Non-Plastic <input type="checkbox"/>
Liquid limit Test:	Multipoint Method <input checked="" type="checkbox"/>	One-point Method <input type="checkbox"/>		Liquid Limit <u>23</u>
Classification:	ASTM D 2487 <input type="checkbox"/>	AASHTO M 145 <input checked="" type="checkbox"/>		Plastic Limit <u>14</u>
Liquid limit Test:	ASTM D 4318 <input type="checkbox"/>	AASHTO T 89 <input checked="" type="checkbox"/>		Plastic Index <u>9</u>
Plastic limit Test:	ASTM D 4318 <input type="checkbox"/>	AASHTO T 90 <input checked="" type="checkbox"/>		Group Symbol <u>A-2-4</u>

Technician Name: Brian Urban

Certification #

Technical Responsibility: Trapp Harris

Signature

Staff Professional

Position



# Particle Size Analysis of Soils

ASTM D 422

Project #: 1611-04-386

Project Name: RBO South Fork Edisto River &amp; Cedar Creek

Client Name: SCDOT

Client Address: PO Box 191, Columbia, SC 29202-0191

Test Date(s): 4/13/05-4/28/05

Report Date: 5/1/05

Boring #: 28

Sample #: 4

Sample Date:

Various

Location: B-28

Elevation:

8.5-10.0

Sample Description: Sandy Fat Clay (CH, A-7-6) medium plasticity, fine to medium sand, white, red, and orange

Particle Size Analysis / Without Hydrometer Analysis			Moisture Content		Natural
				Tare #	205
	Tare Number	205.0	A	Tare Weight	0.00
A	Tare Weight	0.0	B	Wet Weight + Tare Wt.	171.11
B	Total Sample Dry Wt. + Tare Wt.	0.0	C	Dry Weight + Tare Wt.	145.21
C	Total Sample Dry Weight (B-A)	145.21	D	Water Wt. (B-C)	25.90
D	Total Sample Wt. After #200 Wash	67.10	E	Dry Wt.(C-A)	145.21
E	Percent Passing #200 (1-D/C)x100	53.8%	Moisture Content (100 x D/E) (%)		17.8%
Sieve Size (mm)	Sieve Size	Retained Weight	Percent Retained		Percent Passing Total Sample
37.50	1.5"	0.0	0.0%		100.0%
25.00	1.0"	0.00	0.0%		100.0%
19.00	3/4"	0.00	0.0%		100.0%
12.50	1/2"	0.00	0.0%		100.0%
9.50	3/8"	0.00	0.0%		100.0%
4.75	#4	0.00	0.0%		100.0%
2.36	#8	0.50	0.3%		99.7%
1.18	#16	3.30	2.3%		97.4%
0.60	#30	10.60	7.3%		90.1%
0.30	#50	18.40	12.7%		77.4%
0.15	#100	19.40	13.4%		64.1%
0.075	#200	14.90	10.3%		53.8%

<b>Notes:</b>		Maximum Particle Size	Gravel	< 75 mm and > 4.75 mm (#4)	0.0%
		Apparent Relative Density	Coarse Sand	< 4.75 mm and > 2.00 mm (#10)	0.3%
Liquid Limit	53	Fineness Modulus	Medium Sand	< 2.00 mm and > 0.425 mm (#40)	9.6%
Plastic Limit	21	Cu = D60/D10:	Fine Sand	< 0.425 mm and > 0.075 mm (#200)	36.3%
Plastic Index	32	Cc = (D30) <sup>2</sup> / (D10xD60):	% Silt and Clay	< 0.075 mm	53.8%
			Description of Sand & Gravel	Rounded <input checked="" type="checkbox"/>	Angular <input checked="" type="checkbox"/>
			Hard & Durable	<input checked="" type="checkbox"/>	Soft <input type="checkbox"/> Weathered & Friable <input type="checkbox"/>

Organic Content

D10 =

D30 =

D60 =

D50 =

D90 =

ASTM D 422: Particle Size Analysis of Soils

Hydrometer portion of test method not utilized.

ASTM D 421: Dry Preparation of Soil Samples

ASTM D 854: Specific Gravity of Soils

ASTM D 4318: Liquid Limit, Plastic Limit, &amp; Plastic Index of Soils

ASTM D 2487: Classification of Soils for Engineering Purposes (Unified Soil Classification System)

Technician Name:

Brian Urban

Certification #

Technical Responsibility:

Trapp Harris

Signature

Staff Professional

Position





## Liquid Limit, Plastic Limit, and Plastic Index

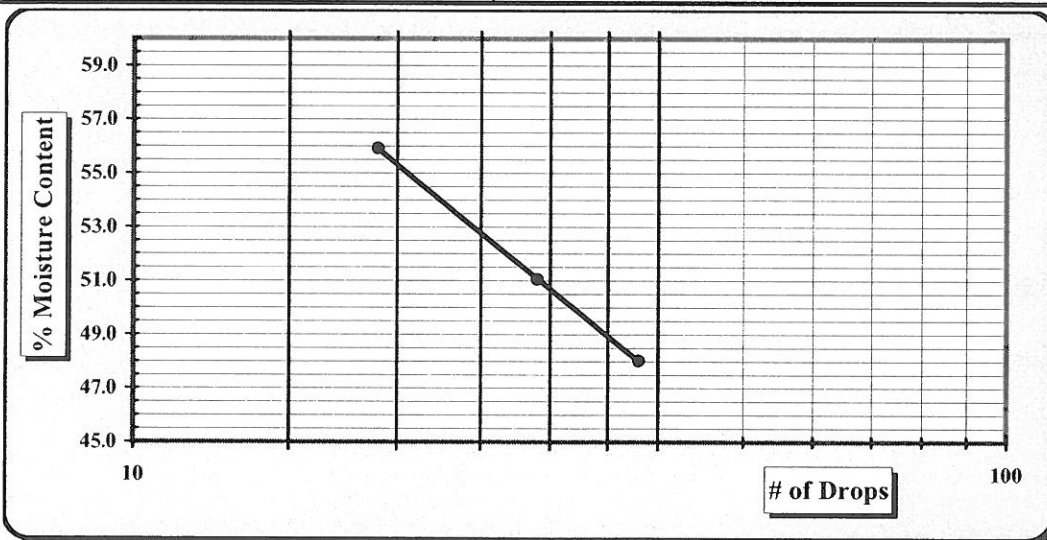
Project #: **1611-04-386**  
 Project Name: RBO South Fork Edisto River & Cedar Creek  
 Client Name: SCDOT  
 Client Address: P.O. Box 191, Columbia, South Carolina, 29202-0191  
 Boring #: 28 Sample #: 4

Report Date: 4/27/05  
 Test Date(s): 4/16/05-4/28/05

Location: B-28 Elevation: 8.5'-10.0'

Sample Description: Sandy Fat Clay (CH, A-7-6) medium plasticity, fine to medium sand, white, red, and

Pan #		Liquid Limit						Plastic Limit		
	Test #	1	2	3	4	5	6	1	2	3
	Tare #	129	109	112				144	131	
A	Tare Weight	13.89	13.75	13.80				13.94	13.56	
B	Wet Soil Weight + A	24.29	23.84	24.62				18.21	17.92	
C	Dry Soil Weight + A	20.56	20.43	21.11				17.47	17.17	
D	Water Weight (B-C)	3.73	3.41	3.51				0.74	0.75	
E	Dry Soil Weight (C-A)	6.67	6.68	7.31				3.53	3.61	
F	% Moisture Content (D/E)*100	55.9%	51.0%	48.0%				21.0%	20.8%	
N	# OF DROPS	19	29	38				Moisture Contents determined by ASTM D 2216		
LL	LL = F * FACTOR									
Ave.	Average							20.9%		



One Point Liquid Limit			
N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.990	29	1.018
24	0.995	30	1.022
25	1.000		

Notes:

### Special Sampling Methods:

Sample Preparation:	Wet Preparation <input type="checkbox"/>	Dry Preparation <input checked="" type="checkbox"/>	Air Dried <input checked="" type="checkbox"/>	NP, Non-Plastic <input type="checkbox"/>
Liquid limit Test:	Multipoint Method <input checked="" type="checkbox"/>	One-point Method <input type="checkbox"/>		Liquid Limit <u>53</u>
Classification:	ASTM D 2487 <input type="checkbox"/>	AASHTO M 145 <input checked="" type="checkbox"/>		Plastic Limit <u>21</u>
Liquid limit Test:	ASTM D 4318 <input type="checkbox"/>	AASHTO T 89 <input checked="" type="checkbox"/>		Plastic Index <u>32</u>
Plastic limit Test:	ASTM D 4318 <input type="checkbox"/>	AASHTO T 90 <input checked="" type="checkbox"/>		Group Symbol <u>A-7-6</u>

Technician Name: Brian Urban

Certification #

Technical Responsibility: Trapp Harris

Signature

Staff Professional

Position



## Particle Size Analysis of Soils

Laboratory Record Version 4.0

Report Date:

4/29/05

Project #: 1611-04-386

Test Date(s): 4/13/05-4/28/05

Liquid Limit:

Project Name: RBO South Fork Edisto River & Cedar Creek

Plastic Limit:

Client Name: SCDOT

Plastic Index:

Client Address: P.O. Box 191, Columbia, South Carolina, 29202-0191

Boring #: 31

Sample #: 4

Sample Date: Various

Location: B-31

Elevation: 8.5'-10.0'

Sample Description: Poorly Graded Sand (SP, A-I-b) low plasticity, fine to medium sand, tan

Pan #:	40	Beaker #:	40	Specific Gravity:	2.599
Hydrometer Jar #:			8372	Pan # (washed sample):	
Pan Tare Weight (grams):			0.00	Moisture Content	Natural
Total Sample Wet Wt. + tare wt. (grams):			116.16	Tare #	44
Weight of Total Sample Air Dried:			116.16	Tare Wt.	11.75
Weight of Air Dried Hydrometer Sample (g):			116.16	Wet Wt. + A	34.41
Total Sample Oven Dried:			116.11	Dry Wt. + A	34.40
Hydrometer Sample Oven Dried (W):			116.11	Water Wt. (B-C)	0.01
% Passing #10:			100.0%	Dry Wt.(C-A)	22.65
Correction Factor a (Table 1):			1.02	% Moisture (100 x D/E)	0.04%

Notes:	Description of Sand & Gravel Particles:	Rounded <input checked="" type="checkbox"/>	Angular <input checked="" type="checkbox"/>	Hard & Durable <input checked="" type="checkbox"/>	Soft <input type="checkbox"/>	Weathered & Friable <input type="checkbox"/>
Maximum Particle Size:	Total Sand:	97.2%	< 4.74 mm and > 0.075 mm	Type:	Mechanical Stirring Apparatus (A)	
% Gravel: 0.0%	Silt & Clay:	2.8%	< 0.075	Dispersion Time:	1 min.	
Coarse Sand: 0.0%	Silt:	0.8%	< 0.075 and > 0.005 mm	Sodium Hexametaphosphate:	40 g./ Liter	
Medium Sand: 57.3%	Clay:	2.0%	< 0.005 mm			
Fine Sand: 40.0%	Colloids:	1.0%	< 0.001 mm	Hydrometer:	151H <input type="checkbox"/> 152H <input checked="" type="checkbox"/>	

Time	Temp. (°C)	Hydrometer		Corrections		Hydrometer R	Percent Passing		Table 2	Table 3		Diameter D = K x (L/T) <sup>1/2</sup>
		Control Cylinder	Reading	Control	Composite Correction		P(-#10) = (R x a / W) x 100	P (total) = P x % Passing #10		L	K	
12:44	2	4.0	8.0	4.0	3.5	4.0	3.5%	3.5%	15.6	0.01391	0.03885	
12:47	5	4.0	7.0	4.0	3.5	3.0	2.6%	2.6%	15.8	0.01391	0.02473	
12:57	15	4.0	7.0	4.0	3.5	3.0	2.6%	2.6%	15.8	0.01391	0.01428	
1:12	30	4.0	7.0	4.0	3.6	3.0	2.6%	2.6%	15.8	0.01391	0.01009	
1:42	60	4.0	6.0	4.0	3.6	2.0	1.8%	1.8%	16.0	0.01391	0.00718	
4:52	250	4.0	6.0	4.0	3.8	2.0	1.8%	1.8%	16.0	0.01408	0.00356	
12:42	1440	4.0	6.0	4.0	3.3	2.0	1.8%	1.8%	16.0	0.01374	0.00145	
12:42	2880	4.0	5.0	4.0	3.3	1.0	0.9%	0.9%	16.1	0.01374	0.00103	

Technician Name / Certification #	References:		ASTM D 422: Particle Size Analysis of Soils	
Brian Urban	ASTM D 421: Dry Preparation of Soil Samples		ASTM D 854: Specific Gravity of Soils	
	ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass			
	ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils			
	ASTM D 2487: Classification of Soils for Engineering Purposes (Unified Soil Classification System)			
Technical Responsibility:	Trapp Harris	Position:		Staff Professional

# Particle Size Analysis of Soils

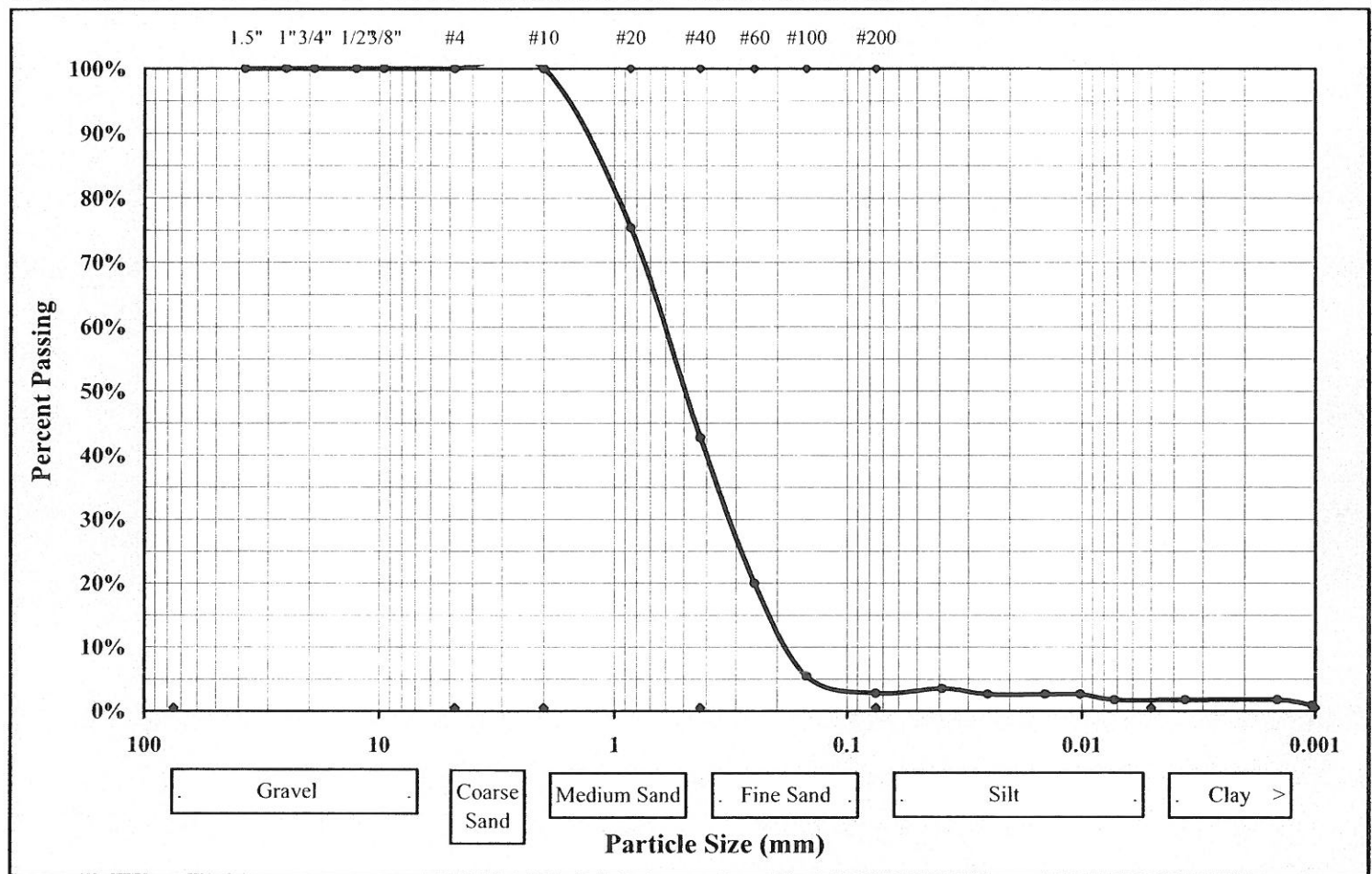
ASTM D 422



S&ME Project #: **1611-04-386**  
 Project Name: **RBO South Fork Edisto River & Cedar Creek**  
 Client Name: **SCDOT**  
 Client Address: **P.O. Box 191, Columbia, South Carolina, 29202-0191**

Report Date: **4/29/05**  
 Test Date(s): **4/13/05-4/28/05**

Boring #: **31** Sample #: **4** Sample Date: **Various**  
 Location: **B-31** Elevation: **8.5'-10.0'**  
 Sample Description: **Poorly Graded Sand (SP, A-1-b) low plasticity, fine to medium sand, tan**



Moisture Content		Gravel	0.0%	Liquid Limit	
Silt & Clay (% Passing #200)	2.8%	Sand	97.2%	Plastic Limit	
Maximum Particle Size	0	Silt	0.8%	Plastic Index	
Specific Gravity	2.599	Clay	2.0%	Colloids	1.0%

Description of Sand & Gravel Particles: Rounded ☒ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐  
 ASTM D 422: Particle Size Analysis of Soils Dispersing Agent: Sodium Hexametaphosphate: 40 g./ Liter  
 Mechanical Stirring Apparatus (A) Length of Dispersion Period: 1 min.

**References:** ASTM D 854: Specific Gravity of Soils  
 ASTM D 421: Dry Preparation of Soil Samples  
 ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass  
 ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils  
 ASTM D 2487: Classification of Soils for Engineering Purposes (Unified Soil Classification System)

Technical Responsibility / Position: **Trapp Harris**

Staff Professional



# SPECIFIC GRAVITY OF SOILS

Test Method A

## ASTM D-854

PROJECT NO 1611-05-386 BORING NO B-31  
 PROJECT NAME RBO South Fork Edisto & Cedar Creek SAMPLE NO 4  
 DATE 4/21/2005 DEPTH 8.5'-10.0'  
 DESCRIPTION Poorly Graded Sand (SP, A-1-b) low plasticity, fine to medium sand, tan  
 TESTED BY BU COMPUTED BY BU CHECKED BY BU

VOL FLASK NO <u>4</u>	VOL FLASK NO <u>      </u>	VOL FLASK NO <u>      </u>
1. WT. OF SOIL & VOL FLASK <u>86.52</u> g	1. WT. OF SOIL & VOL FLASK <u>      </u> g	1. WT. OF SOIL & VOL FLASK <u>      </u> g
2. Wt. of flask <u>65.84</u> g	2. Wt. of flask <u>      </u> g	2. Wt. of flask <u>      </u> g
A. WT. OF SOIL <u>20.68</u> g	A. WT. OF SOIL <u>0</u> g	A. WT. OF SOIL <u>      </u> g
B. WT. OF VOL. (from vol. Flask chart) FLASK & WATER <u>165.536</u> g	B. WT. OF VOL. (from vol. Flask chart) FLASK & WATER <u>      </u> g	B. WT. OF VOL. (from vol. Flask chart) FLASK & WATER <u>      </u> g
WATER TEM <u>27</u> °C	WATER TEMP. <u>      </u> °C	WATER TEMP. <u>      </u> °C
C. WT. OF VOL. FLASK, SOIL & WATER <u>178.27</u> g	C. WT. OF VOL. FLASK, SOIL & WATER <u>      </u> g	C. WT. OF VOL. FLASK, SOIL & WATER <u>      </u> g
D. SPECIFIC GRAVITY = <u>A</u> = <u>2.603</u> g	D. SPECIFIC GRAVITY = <u>A</u> = <u>      </u> g	D. SPECIFIC GRAVITY = <u>A</u> = <u>      </u> g
A+(B-C)	A+(B-C)	A+(B-C)

SPECIFIC GRAVITY (CORRECTED)  $G_s = D \cdot K =$

H <sub>2</sub> O TEMP. °C	CORRECTION FACTOR, K
18	1.0004
19	1.0002
20	1.0000
21	0.9998
22	0.9996
23	0.9993
24	0.9991
25	0.9989
26	0.9986
27	0.9983
28	0.9980
29	0.9977
30	0.9974

FLASK NO. 4  
 $G_s = D \cdot K$  2.599

FLASK NO. 0  
 $G_s = D \cdot K$        

FLASK NO. 0  
 $G_s = D \cdot K$        

AVERAGE  
 $G_s =$  **2.599**





# Particle Size Analysis of Soils

ASTM D 422

Project #: 1611-04-386

Project Name: RBO South Fork Edisto River &amp; Cedar Creek

Client Name: SCDOT

Client Address: PO Box 191, Columbia, South Carolina, 29202-0191

Test Date(s): 4/13/05-4/28/05

Report Date: 5/1/05

Boring #: 31

Sample #: 4

Sample Date:

Various

Location: B-31

Elevation:

8.5'-10.0'

Sample Description: Poorly Graded Sand (SP, A-1-b) low plasticity, fine to medium sand, tan

Particle Size Analysis / Without Hydrometer Analysis			Moisture Content		Natural
				Tare #	40
	Tare Number	40.0	A	Tare Weight	0.00
A	Tare Weight	0.0	B	Wet Weight + Tare Wt.	43.46
B	Total Sample Dry Wt. + Tare Wt.	0.0	C	Dry Weight + Tare Wt.	35.26
C	Total Sample Dry Weight (B-A)	116.16	D	Water Wt. (B-C)	8.20
D	Total Sample Wt. After #200 Wash	112.90	E	Dry Wt.(C-A)	35.26
E	Percent Passing #200 (1-D/C)x100	2.8%	Moisture Content (100 x D/E) (%)		23.3%
Sieve Size (mm)	Sieve Size	Retained Weight	Percent Retained		Percent Passing Total Sample
37.50	1.5"	0.0	0.0%		100.0%
25.00	1.0"	0.00	0.0%		100.0%
19.00	3/4"	0.00	0.0%		100.0%
12.50	1/2"	0.00	0.0%		100.0%
9.50	3/8"	0.00	0.0%		100.0%
4.75	#4	0.00	0.0%		100.0%
2.36	#8	0.00	0.0%		100.0%
1.18	#16	3.20	2.8%		97.2%
0.60	#30	28.40	24.4%		72.8%
0.30	#50	61.30	52.8%		20.0%
0.15	#100	16.90	14.5%		5.5%
0.075	#200	3.10	2.7%		2.8%

<b>Notes:</b> Maximum Particle Size		Gravel	< 75 mm and > 4.75 mm (#4)	0.0%
Apparent Relative Density		Coarse Sand	< 4.75 mm and > 2.00 mm (#10)	0.0%
Liquid Limit	Fineness Modulus	Medium Sand	< 2.00 mm and > 0.425 mm (#40)	27.2%
Plastic Limit	Cu = D60/D10:	Fine Sand	< 0.425 mm and > 0.075 mm (#200)	70.0%
Plastic Index	Cc = (D30) <sup>2</sup> / (D10xD60):	% Silt and Clay	< 0.075 mm	2.8%
		Description of Sand & Gravel	Rounded <input checked="" type="checkbox"/>	Angular <input checked="" type="checkbox"/>
		Hard & Durable <input checked="" type="checkbox"/>	Soft <input type="checkbox"/>	Weathered & Friable <input type="checkbox"/>

Organic Content

D10 =

D30 =

D60 =

D50 =

D90 =

ASTM D 422: Particle Size Analysis of Soils

Hydrometer portion of test method not utilized.

ASTM D 421: Dry Preparation of Soil Samples

ASTM D 854: Specific Gravity of Soils

ASTM D 4318: Liquid Limit, Plastic Limit, &amp; Plastic Index of Soils

ASTM D 2487: Classification of Soils for Engineering Purposes (Unified Soil Classification System)

Technician Name:

Brian Urban

Certification #

Technical Responsibility:

Trapp Harris

Signature

Staff Professional

Position



## Particle Size Analysis of Soils

Laboratory Record Version 4.0

Report Date:

4/29/05

Project #: 1611-04-386  
Project Name: RBO South Fork Edisto River & Cedar Creek  
Client Name: SCDOT  
Client Address: P.O. Box 191, Columbia, South Carolina, 29202-0191  
Boring #: 32  
Location: B-32  
Sample #: 1  
Sample Date: Various  
Elevation: 12.0'-13.5'  
Test Date(s): 4/13/05-4/28/05  
Liquid Limit:  
Plastic Limit:  
Plastic Index:

Client Address: P.O. Box 191, Columbia, South Carolina, 29202-0191				Sample #: 1		Sample Date: Various		Sieve	Retained Wt.	Percent Passing
Boring #: 32		Location: B-32		Elevation: 12.0'-13.5'				3.0"	0.0	100.0%
Sample Description: Poorly Graded Sand w/ Silt (SP-SM, A-1-b) low plasticity, fine to medium sand, tan				Specific Gravity: 2.616		Soil Mortar (portion passing the #10 sieve)				100.0%
Pan #:	7	Beaker #:	7	Pan # (washed sample):		0.0				100.0%
Hydrometer Jar #:			8373		Moisture Content		Hygroscopic		Natural	100.0%
Pan Tare Weight (grams):			0.00		Tare #		59		0.0	100.0%
Total Sample Wet Wt. + tare wt. (grams):			119.62		A		Tare Wt.		11.32	100.0%
Weight of Total Sample Air Dried:			119.62		B		Wet Wt. + A		36.12	66.2%
Weight of Air Dried Hydrometer Sample (g):			119.62		C		Dry Wt. + A		36.10	43.4%
Total Sample Oven Dried:			119.53		D		Water Wt. (B-C)		0.02	22.4%
Hydrometer Sample Oven Dried (W):			119.52		E		Dry Wt.(C-A)		24.78	11.6%
% Passing #10:			91.0%		% Moisture (100 x D/E)		0.08%		105.6	10.6%
Correction Factor a (Table 1):			1.01						111.5	6.7%
									#200	6.1%

Notes:		Description of Sand & Gravel Particles:		Rounded <input checked="" type="checkbox"/> Angular <input checked="" type="checkbox"/>		Hard & Durable <input checked="" type="checkbox"/>		Soft <input type="checkbox"/> Weathered & Friable <input type="checkbox"/>	
Maximum Particle Size:		Total Sand:		93.9%		< 4.74 mm and > 0.075 mm		Type: Mechanical Stirring Apparatus (A)	
% Gravel:		< 75 mm and > 4.75 mm		Silt & Clay:		6.1%		< 0.075	
Coarse Sand:		< 4.75 mm and > 2.00 mm		Silt:		5.1%		< 0.075 and > 0.005 mm	
Medium Sand:		< 2.00 mm and > 0.425 mm		Clay:		1.0%		< 0.005 mm	
Fine Sand:		< 0.425 mm and > 0.075 mm		Colloids:		0.0%		< 0.001 mm	

Time	Temp. (°C)	Hydrometer Reading	Corrections		Hydrometer R	Percent Passing		Table 2	Table 3		Diameter D = $K \times (L/T)^{1/2}$
			Control Cylinder	Composite Correction		P(-#10) = (R x a / W) x 100	P (total) = P x % Passing #10		L	K	
1:03	2	21.5	4.0	3.5	3.0	2.5%	2.3%	15.8	0.01369	0.03848	
1:06	5	21.5	4.0	3.5	2.0	1.7%	1.5%	16.0	0.01369	0.02449	
1:16	15	21.4	4.0	3.6	2.0	1.7%	1.5%	16.0	0.01369	0.01414	
1:31	30	21.4	4.0	3.6	2.0	1.7%	1.5%	16.0	0.01369	0.01000	
2:01	60	21.4	4.0	3.6	1.0	0.8%	0.8%	16.1	0.01369	0.00709	
5:11	250	20.7	4.0	3.8	1.0	0.8%	0.8%	16.1	0.01386	0.00352	
1:01	1440	22.4	4.0	3.3	1.0	0.8%	0.8%	16.1	0.01353	0.00143	
1:01	2880	22.2	4.0	3.3	0.0	0.0%	0.0%	16.3	0.01353	0.00102	

Technician Name / Certification #		References:	
Brian Urban		ASTM D 421: Dry Preparation of Soil Samples	
		ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass	
		ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils	
		ASTM D 2487: Classification of Soils for Engineering Purposes (Unified Soil Classification System)	
Technical Responsibility: Trapp Harris		Position: Staff Professional	

# Particle Size Analysis of Soils

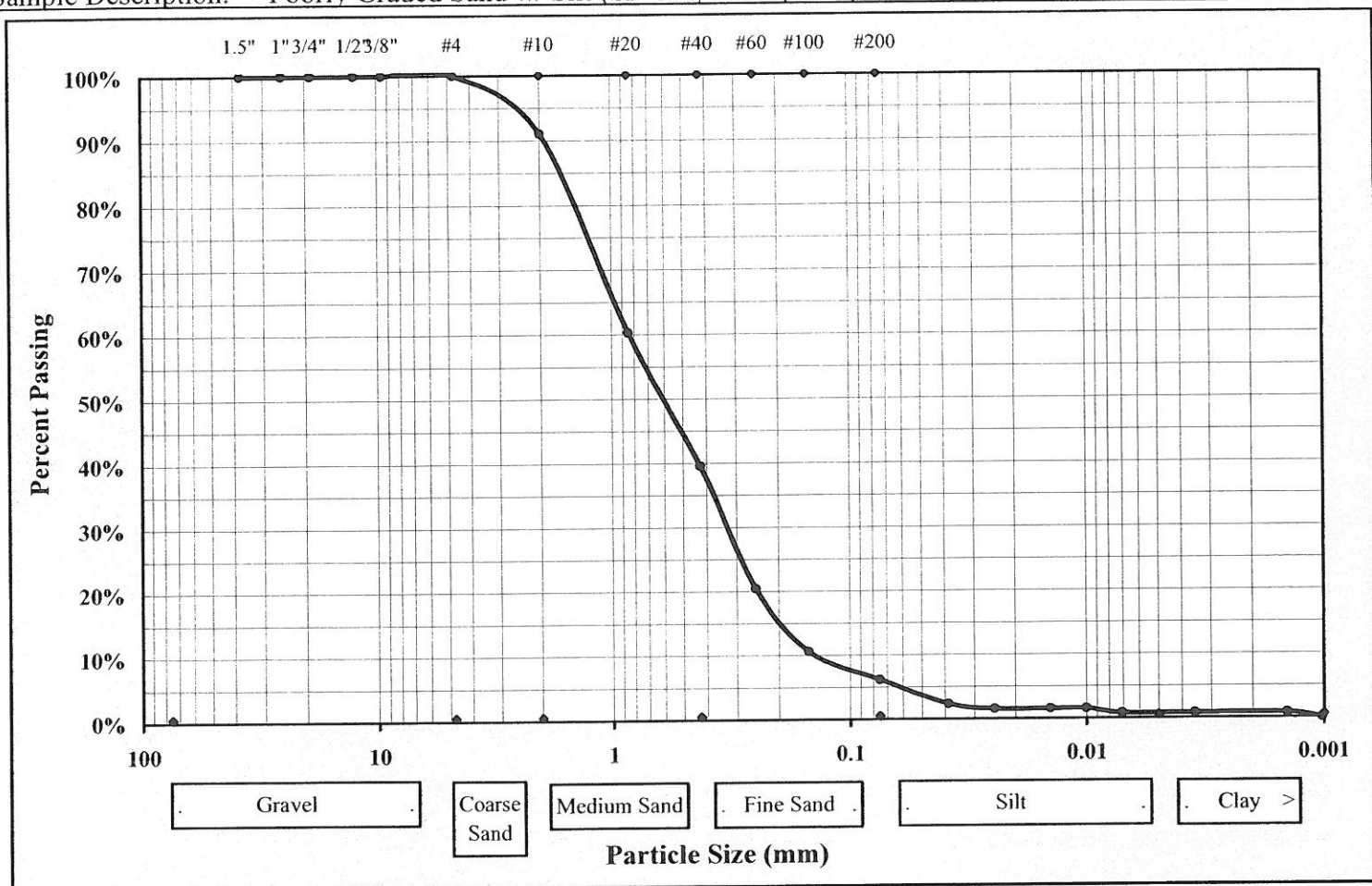
ASTM D 422



S&ME Project #: **1611-04-386**  
 Project Name: **RBO South Fork Edisto River & Cedar Creek**  
 Client Name: **SCDOT**  
 Client Address: **P.O. Box 191, Columbia, South Carolina, 29202-0191**

Report Date: **4/29/05**  
 Test Date(s): **4/13/05-4/28/05**

Boring #: **32** Sample #: **1** Sample Date: **Various**  
 Location: **B-32** Elevation: **12.0'-13.5'**  
 Sample Description: **Poorly Graded Sand w/ Silt (SP-SM, A-1-b) low plasticity, fine to medium sand, tan**



Moisture Content		Gravel	0.0%	Liquid Limit
Silt & Clay (% Passing #200)	6.1%	Sand	93.9%	Plastic Limit
Maximum Particle Size	0	Silt	5.1%	Plastic Index
Specific Gravity	2.616	Clay	1.0%	Colloids
				0.0%

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

ASTM D 422: Particle Size Analysis of Soils

Dispersing Agent: Sodium Hexametaphosphate: 40 g./ Liter

Mechanical Stirring Apparatus (A) Length of Dispersion Period: 1 min.

References: ASTM D 854: Specific Gravity of Soils  
 ASTM D 421: Dry Preparation of Soil Samples  
 ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass  
 ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils  
 ASTM D 2487: Classification of Soils for Engineering Purposes (Unified Soil Classification System)

Technical Responsibility / Position: Trapp Harris

Staff Professional



# SPECIFIC GRAVITY OF SOILS

Test Method A

ASTM D-854

PROJECT NO 1611-05-386 BORING NO B-32  
 PROJECT NAME RBO South Fork Edisto & Cedar Creek SAMPLE NO 1  
 DATE 4/21/2005 DEPTH 12.0'-13.5'  
 DESCRIPTION Poorly Graded Sand w/ Silt (SP-SM, A-1-b) low plasticity, fine to medium sand, tan  
 TESTED BY BU COMPUTED BY BU CHECKED BY BU

VOL FLASK NO 5  
 1. WT. OF SOIL & VOL FLASK 85.21 g  
 2. Wt. of flask 64.63 g  
 A. WT. OF SOIL 20.58 g  
 B. WT. OF VOL. (from vol. Flask chart) FLASK & WATER 164.255 g  
 WATER TEM 27 °C  
 C. WT. OF VOL. FLASK, SOIL & WATER 176.98 g  
 D. SPECIFIC GRAVITY =  
 $\frac{A}{A+(B-C)} = \frac{20.58}{20.58 + (164.255 - 176.98)} = 2.620$  g

VOL FLASK NO           
 1. WT. OF SOIL & VOL FLASK          g  
 2. Wt. of flask          g  
 A. WT. OF SOIL 0 g  
 B. WT. OF VOL. (from vol. Flask chart) FLASK & WATER          g  
 WATER TEMP.          °C  
 C. WT. OF VOL. FLASK, SOIL & WATER          g  
 D. SPECIFIC GRAVITY =  
 $\frac{A}{A+(B-C)} = \frac{0}{0 + ( - - - - - )} = \frac{0}{ - - - - - }$  g

VOL FLASK NO           
 1. WT. OF SOIL & VOL FLASK          g  
 2. Wt. of flask          g  
 A. WT. OF SOIL          g  
 B. WT. OF VOL. (from vol. Flask chart) FLASK & WATER          g  
 WATER TEMP.          °C  
 C. WT. OF VOL. FLASK, SOIL & WATER          g  
 D. SPECIFIC GRAVITY =  
 $\frac{A}{A+(B-C)} = \frac{ - - - - - }{ - - - - - + ( - - - - - - - - - ) } = \frac{ - - - - - }{ - - - - - }$  g

SPECIFIC GRAVITY (CORRECTED)  $G_s = D \cdot K =$

H <sub>2</sub> O TEMP. °C	CORRECTION FACTOR, K
18	1.0004
19	1.0002
20	1.0000
21	0.9998
22	0.9996
23	0.9993
24	0.9991
25	0.9989
26	0.9986
27	0.9983
28	0.9980
29	0.9977
30	0.9974

FLASK NO. 5  
 $G_s = D \cdot K = 2.616$

FLASK NO. 0  
 $G_s = D \cdot K =$

FLASK NO. 0  
 $G_s = D \cdot K =$

AVERAGE  
 $G_s =$  **2.616**



## Particle Size Analysis of Soils

ASTM D 422



Project #: 1611-04-386

Project Name: RBO South Fork Edisto River &amp; Cedar Creek

Client Name: SCDOT

Client Address: PO Box 191, Columbia, South Carolina, 29202-0191

Test Date(s): 4/13/05-4/28/05

Report Date: 5/1/05

Boring #: 32

Sample #: 1

Sample Date: Various

Location: B-32

Elevation: 12.0'-13.5'

Sample Description: Poorly Graded Sand w/ Silt (SP-SM, A-1-b) low plasticity, fine to medium sand, tan

Particle Size Analysis / Without Hydrometer Analysis			Moisture Content		Natural
				Tare #	213
	Tare Number	213.0	A	Tare Weight	0.00
A	Tare Weight	0.0	B	Wet Weight + Tare Wt.	36.81
B	Total Sample Dry Wt. + Tare Wt.	0.0	C	Dry Weight + Tare Wt.	29.26
C	Total Sample Dry Weight (B-A)	119.62	D	Water Wt. (B-C)	7.55
D	Total Sample Wt. After #200 Wash	111.50	E	Dry Wt.(C-A)	29.26
E	Percent Passing #200 (1-D/C)x100	6.8%	Moisture Content (100 x D/E) (%)		25.8%
Sieve Size (mm)	Sieve Size	Retained Weight	Percent Retained		Percent Passing Total Sample
37.50	1.5"	0.0	0.0%		100.0%
25.00	1.0"	0.00	0.0%		100.0%
19.00	3/4"	0.00	0.0%		100.0%
12.50	1/2"	0.00	0.0%		100.0%
9.50	3/8"	0.00	0.0%		100.0%
4.75	#4	0.00	0.0%		100.0%
2.36	#8	1.60	1.3%		98.7%
1.18	#16	14.60	12.2%		86.5%
0.60	#30	36.40	30.4%		56.0%
0.30	#50	40.10	33.5%		22.5%
0.15	#100	12.90	10.8%		11.7%
0.075	#200	5.90	4.9%		6.8%

Notes:	Maximum Particle Size	Gravel	< 75 mm and > 4.75 mm (#4)	0.0%
	Apparent Relative Density	Coarse Sand	< 4.75 mm and > 2.00 mm (#10)	1.3%
Liquid Limit	Fineness Modulus	Medium Sand	< 2.00 mm and > 0.425 mm (#40)	42.6%
Plastic Limit	Cu = D60/D10:	Fine Sand	< 0.425 mm and > 0.075 mm (#200)	49.2%
Plastic Index	Cc =(D30) <sup>2</sup> / (D10xD60):	% Silt and Clay	< 0.075 mm	6.8%
		Description of Sand & Gravel	Rounded <input checked="" type="checkbox"/>	Angular <input checked="" type="checkbox"/>
		Hard & Durable <input checked="" type="checkbox"/>	Soft <input type="checkbox"/>	Weathered & Friable <input type="checkbox"/>
Organic Content				
D10 =	D30 =	D60 =	D50 =	D90 =

ASTM D 422: Particle Size Analysis of Soils

Hydrometer portion of test method not utilized.

ASTM D 421: Dry Preparation of Soil Samples

ASTM D 854: Specific Gravity of Soils

ASTM D 4318: Liquid Limit, Plastic Limit, &amp; Plastic Index of Soils

ASTM D 2487: Classification of Soils for Engineering Purposes (Unified Soil Classification System)

Technician Name:

Brian Urban

Certification #

Technical Responsibility:

Trapp Harris

Signature

Staff Professional

Position

# Particle Size Analysis of Soils

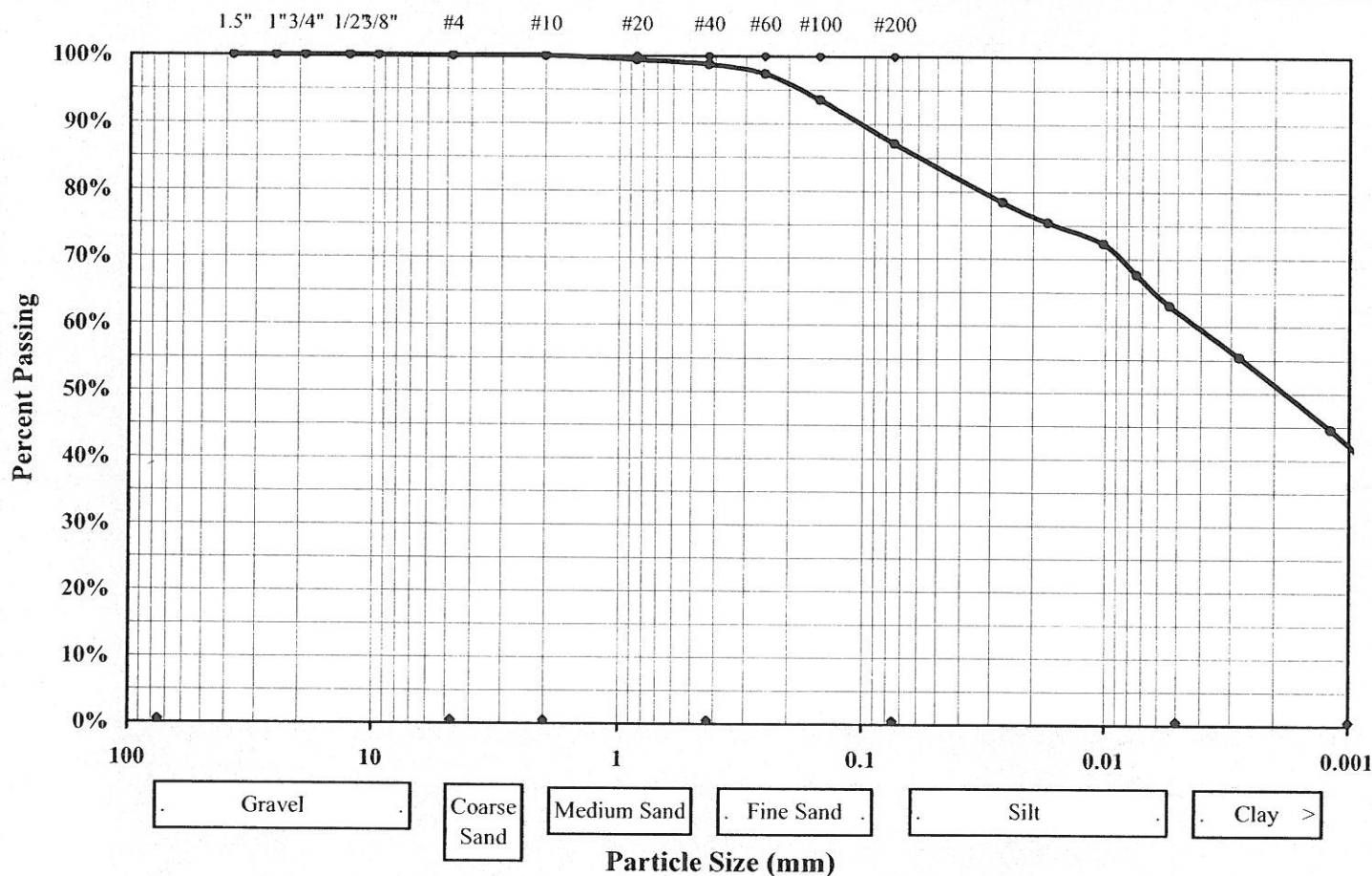
ASTM D 422



S&ME Project #: **1611-04-386**  
 Project Name: **RBO South Fork Edisto River & Cedar Creek**  
 Client Name: **SCDOT**  
 Client Address: **P.O. Box 191, Columbia, South Carolina, 29202-0191**

Report Date: **4/29/05**  
 Test Date(s): **4/13/05-4/28/05**

Boring #: **32** Sample #: **2** Sample Date: **Various**  
 Location: **B-32** Elevation: **18.6'-20.1'**  
 Sample Description: **Fat Clay (CH, A-7-6) medium plasticity, fine sand, purple with white and orange**



Moisture Content		Gravel	0.0%	Liquid Limit	59
Silt & Clay (% Passing #200)	87.1%	Sand	12.9%	Plastic Limit	27
Maximum Particle Size	0	Silt	22.1%	Plastic Index	32
Specific Gravity	2.675	Clay	65.0%	Colloids	45.0%

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

ASTM D 422: Particle Size Analysis of Soils

Dispersing Agent: Sodium Hexametaphosphate: 40 g./ Liter  
 Mechanical Stirring Apparatus (A) Length of Dispersion Period: 1 min.

**References:** ASTM D 854: Specific Gravity of Soils  
 ASTM D 421: Dry Preparation of Soil Samples  
 ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass  
 ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils  
 ASTM D 2487: Classification of Soils for Engineering Purposes (Unified Soil Classification System)

Technical Responsibility / Position: **Trapp Harris**

**Staff Professional**



# SPECIFIC GRAVITY OF SOILS

Test Method A

## ASTM D-854

PROJECT NO 1611-05-386 BORING NO B-32  
 PROJECT NAME RBO South Fork Edisto & Cedar Creek SAMPLE NO 2  
 DATE 4/21/2005 DEPTH 18.6'-20.1'  
 DESCRIPTION Fat Clay (CH, A-7-6) medium plasticity, fine sand, purple with white and orange  
 TESTED BY BU COMPUTED BY BU CHECKED BY BU

VOL FLASK NO	1. WT. OF SOIL & VOL FLASK	2. Wt. of flask	A. WT. OF SOIL	B. WT. OF VOL. (from vol. Flask chart) FLASK & WATER	WATER TEM	C. WT. OF VOL. FLASK, SOIL & WATER	D. SPECIFIC GRAVITY =
3	85.1 g	64.61 g	20.49 g	164.266 g	27 °C	177.11 g	$\frac{A}{A+(B-C)} = \frac{2.680}{g}$

SPECIFIC GRAVITY (CORRECTED)  $G_s = D \cdot K =$

H <sub>2</sub> O TEMP. °C	CORRECTION FACTOR, K
18	1.0004
19	1.0002
20	1.0000
21	0.9998
22	0.9996
23	0.9993
24	0.9991
25	0.9989
26	0.9986
27	0.9983
28	0.9980
29	0.9977
30	0.9974

FLASK NO. 3  
 $G_s = D \cdot K = 2.675$

FLASK NO. 0  
 $G_s = D \cdot K =$

FLASK NO. 0  
 $G_s = D \cdot K =$

AVERAGE

$G_s = 2.675$





# Particle Size Analysis of Soils

ASTM D 422

Test Date(s): 4/13/05-4/28/05  
Report Date: 5/1/05

Project #: 1611-04-386

Project Name: RBO South Fork Edisto River &amp; Cedar Creek

Client Name: SCDOT

Client Address: PO Box 191, Columbia, South Carolina, 29202-0191

Boring #: 32 Sample #: 2 Sample Date: Various  
Location: B-32 Elevation: 18.6'-20.0'  
Sample Description: Fat Clay (CH, A-7-6) medium plasticity, fine sand, purple with white and orange

Particle Size Analysis / Without Hydrometer Analysis			Moisture Content		Natural
				Tare #	8
A	Tare Number	8.0	A	Tare Weight	0.00
B	Tare Weight	0.0	B	Wet Weight + Tare Wt.	22.11
C	Total Sample Dry Wt. + Tare Wt.	0.0	C	Dry Weight + Tare Wt.	16.88
D	Total Sample Dry Weight (B-A)	65.21	D	Water Wt. (B-C)	5.23
E	Total Sample Wt. After #200 Wash	8.40	E	Dry Wt.(C-A)	16.88
	Percent Passing #200 (1-D/C)x100	87.1%		Moisture Content (100 x D/E) (%)	31.0%
Sieve Size (mm)	Sieve Size	Retained Weight	Percent Retained	Percent Passing Total Sample	
37.50	1.5"	0.0	0.0%	100.0%	
25.00	1.0"	0.00	0.0%	100.0%	
19.00	3/4"	0.00	0.0%	100.0%	
12.50	1/2"	0.00	0.0%	100.0%	
9.50	3/8"	0.00	0.0%	100.0%	
4.75	#4	0.00	0.0%	100.0%	
2.36	#8	0.00	0.0%	100.0%	
1.18	#16	0.40	0.6%	99.4%	
0.60	#30	0.50	0.8%	97.4%	
0.30	#50	0.80	1.2%	93.6%	
0.15	#100	2.50	3.8%	87.1%	
0.075	#200	4.20	6.4%	87.1%	

Notes:		Maximum Particle Size		Gravel	< 75 mm and > 4.75 mm (#4)	0.0%
		Apparent Relative Density		Coarse Sand	< 4.75 mm and > 2.00 mm (#10)	0.0%
Liquid Limit		59	Fineness Modulus	Medium Sand	< 2.00 mm and > 0.425 mm (#40)	1.4%
Plastic Limit		27	Cu = D60/D10:	Fine Sand	< 0.425 mm and > 0.075 mm (#200)	11.5%
Plastic Index		22	Cc = (D30) <sup>2</sup> / (D10xD60):	% Silt and Clay	< 0.075 mm	87.1%
				Description of Sand & Gravel	Rounded <input checked="" type="checkbox"/> Angular <input checked="" type="checkbox"/>	
				Hard & Durable <input checked="" type="checkbox"/> Soft <input type="checkbox"/>	Weathered & Friable <input type="checkbox"/>	

Organic Content

D10 = D30 = D60 = D50 = D90 =

ASTM D 422: Particle Size Analysis of Soils

Hydrometer portion of test method not utilized.

ASTM D 421: Dry Preparation of Soil Samples

ASTM D 854: Specific Gravity of Soils

ASTM D 4318: Liquid Limit, Plastic Limit, &amp; Plastic Index of Soils

ASTM D 2487: Classification of Soils for Engineering Purposes (Unified Soil Classification System)

Technician Name:

Brian Urban

Certification #

Technical Responsibility:

Trapp Harris

Signature

Staff Professional

Position





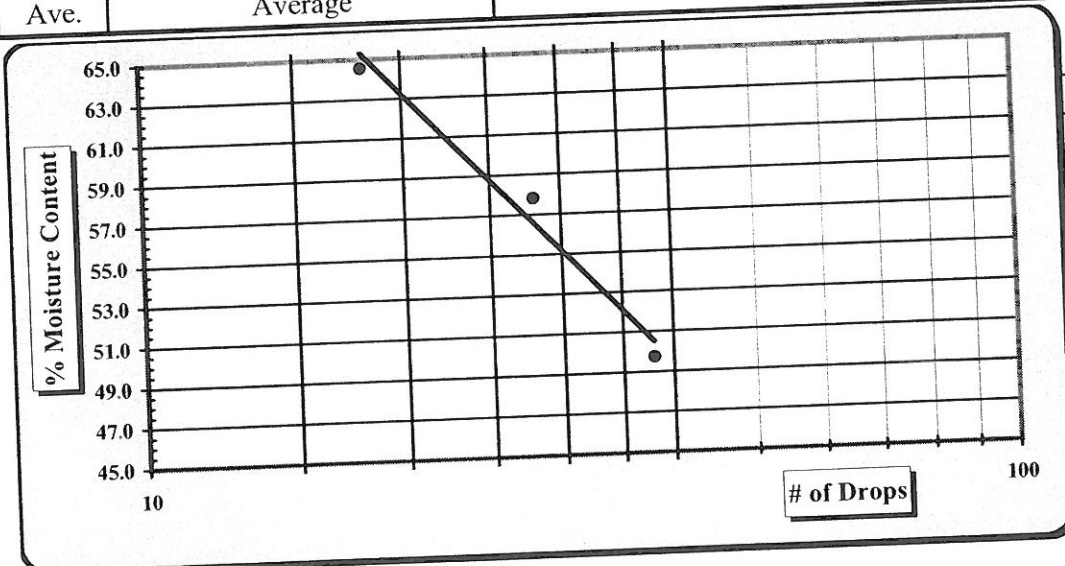
# Liquid Limit, Plastic Limit, and Plastic Index

Project #: **1611-04-386**  
 Project Name: **RBO South Fork Edisto River & Cedar Creek**  
 Client Name: **SCDOT**  
 Client Address: **P.O. Box 191, Columbia, South Carolina, 29202-0191**  
 Boring #: **32** Sample #: **2** Sample Date: **Various**  
 Location: **B-32** Elevation: **18.6'-20.1'**

Report Date: **4/26/05**  
 Test Date(s): **4/16/05-4/28/05**

Sample Description: **Fat Clay (CH, A-7-6) medium plasticity, fine sand, purple with white and orange**

Pan #	Test #	Liquid Limit						Plastic Limit		
		1	2	3	4	5	6	1	2	3
	Test #							108	138	
	Tare #	126	117	132				13.38	13.83	
A	Tare Weight	13.79	13.80	13.69				20.00	19.48	
B	Wet Soil Weight + A	25.67	24.72	24.68				18.58	18.29	
C	Dry Soil Weight + A	21.01	20.72	21.03				1.42	1.19	
D	Water Weight (B-C)	4.66	4.00	3.65				5.20	4.46	
E	Dry Soil Weight (C-A)	7.22	6.92	7.34				27.3%	26.7%	
F	% Moisture Content (D/E)*100	64.5%	57.8%	49.7%				Moisture Contents determined by ASTM D 2216		
N	# OF DROPS	18	28	38						
LL	LL = F * FACTOR							27.0%		
Ave.	Average									



One Point Liquid Limit			
N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.990	29	1.018
24	0.995	30	1.022
25	1.000		

Notes:

Special Sampling Methods:

Sample Preparation: Wet Preparation ☐ Dry Preparation ☒ Air Dried ☒  
 Liquid limit Test: Multipoint Method ☒ One-point Method ☐  
 Classification: ASTM D 2487 ☐ AASHTO M 145 ☒  
 Liquid limit Test: ASTM D 4318 ☐ AASHTO T 89 ☒  
 Plastic limit Test: ASTM D 4318 ☐ AASHTO T 90 ☒

NP, Non-Plastic ☐  
 Liquid Limit 59  
 Plastic Limit 27  
 Plastic Index 32  
 Group Symbol A-7-6

Technician Name:

Brian Urban

Certification #

Technical Responsibility:

Trapp Harris

Signature

Staff Professional

Position



## Particle Size Analysis of Soils

Laboratory Record Version 4.0

Report Date:

4/29/05

Project #: 1611-04-386

Test Date(s):

4/13/05-4/28/05

Liquid Limit: 46

Project Name:

RBO South Fork Edisto River & Cedar Creek

Plastic Limit: 22

Client Name:

SCDOT

Plastic Index: 24

Client Address:

P.O. Box 191, Columbia, South Carolina, 29202-0191

Boring #: 32

Sample #: 4

Sample Date: Various

Elevation: 29.4'-30.9'

Location: B-32

Sample Description: Sandy Lean Clay (CL, A-7-6) medium plasticity, fine sand, gray

Pan #:	1	Beaker #:	1	Specific Gravity:	2.623
Hydrometer Jar #:	8368	Pan # (washed sample):			
Pan Tare Weight (grams):	0.00	Moisture Content	Hygroscopic	Natural	
Total Sample Wet Wt. + tare wt. (grams):	65.74	Tare #	w		
Weight of Total Sample Air Dried:	65.74	A	Tare Wt.	11.48	
Weight of Air Dried Hydrometer Sample (g):	65.74	B	Wet Wt. + A	33.13	
Total Sample Oven Dried:	65.62	C	Dry Wt. + A	33.09	
Hydrometer Sample Oven Dried (W):	65.62	D	Water Wt. (B-C)	0.04	
% Passing #10:	100.0%	E	Dry Wt. (C-A)	21.61	
Correction Factor a (Table 1):	1.01	% Moisture (100 x D/E)	0.19%		

Notes:	Description of Sand & Gravel Particles:	Rounded <input checked="" type="checkbox"/>	Angular <input checked="" type="checkbox"/>	Hard & Durable <input checked="" type="checkbox"/>	Soft <input type="checkbox"/>	Weathered & Friable <input type="checkbox"/>
Maximum Particle Size:	Total Sand:	27.1%	< 4.74 mm and > 0.075 mm		Type:	Mechanical Stirring Apparatus (A)
% Gravel:	< 75 mm and > 4.75 mm			< 0.075	Dispersion Time:	1 min.
Coarse Sand:	< 4.75 mm and > 2.00 mm			< 0.075 and > 0.005 mm		Sodium Hexametaphosphate: 40 g./ Liter
Medium Sand:	< 2.00 mm and > 0.425 mm			< 0.005 mm		
Fine Sand:	< 0.425 mm and > 0.075 mm			< 0.001 mm	Hydrometer:	151H <input type="checkbox"/> 152H <input checked="" type="checkbox"/>

Time	Temp. (°C)	Corrections		Hydrometer		Percent Passing		Table 2		Table 3		Diameter D = K x (L/T) <sup>1/2</sup>
		Control Cylinder	Composite Correction	Control Cylinder	Reading	P(-#10) = (R x a / W) x 100	P (total) = P x % Passing #10	L	K	L	K	
11:56	22.0	4.0	3.3	4.0	47.0	66.2%	66.2%	9.2	0.01353	0.01353	0.02902	
11:59	22.0	4.0	3.3	4.0	46.0	64.6%	64.6%	9.4	0.01353	0.01353	0.01855	
12:09	22.0	4.0	3.3	4.0	44.0	61.6%	61.6%	9.7	0.01353	0.01353	0.01088	
12:24	22.0	4.0	3.3	4.0	43.0	60.0%	60.0%	9.9	0.01353	0.01353	0.00777	
12:54	21.5	4.0	3.5	4.0	38.0	58.5%	58.5%	10.1	0.01369	0.01369	0.00562	
4:04	20.7	4.0	3.8	4.0	35.0	53.9%	53.9%	10.6	0.01386	0.01386	0.00285	
11:54	22.4	4.0	3.3	4.0	28.0	43.1%	43.1%	11.7	0.01353	0.01353	0.00122	
11:54	22.2	4.0	3.3	4.0	24.0	36.9%	36.9%	12.4	0.01353	0.01353	0.00089	

Technician Name / Certification #	Brian Urban	References:	ASTM D 421: Dry Preparation of Soil Samples ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils ASTM D 2487: Classification of Soils for Engineering Purposes (Unified Soil Classification System)
Technical Responsibility:	Trapp Harris	Position:	Staff Professional

# Particle Size Analysis of Soils

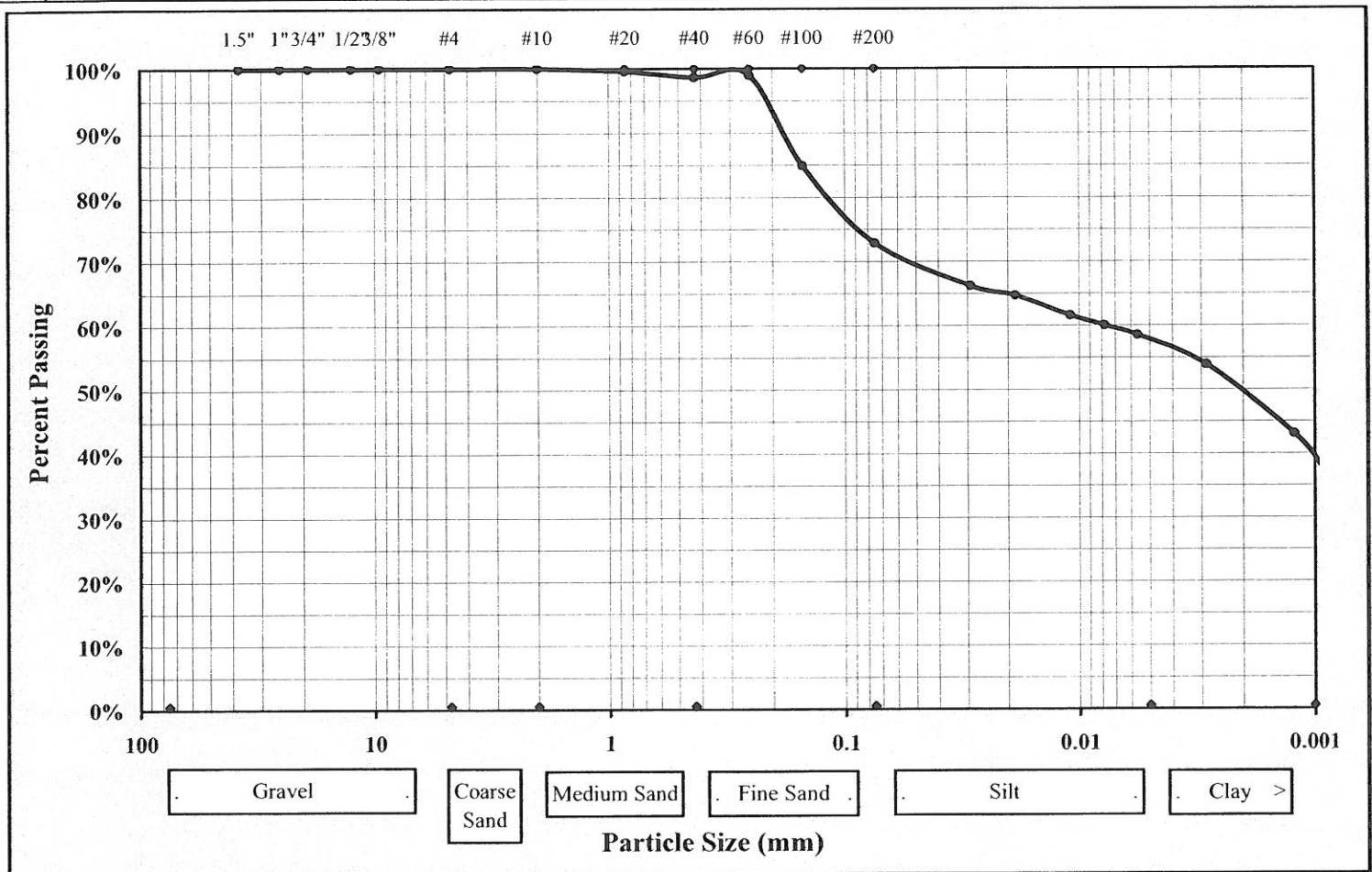
ASTM D 422



S&ME Project #: **1611-04-386**  
 Project Name: **RBO South Fork Edisto River & Cedar Creek**  
 Client Name: **SCDOT**  
 Client Address: **P.O. Box 191, Columbia, South Carolina, 29202-0191**

Report Date: **4/29/05**  
 Test Date(s): **4/13/05-4/28/05**

Boring #: **32** Sample #: **4** Sample Date: **Various**  
 Location: **B-32** Elevation: **29.4'-30.9'**  
 Sample Description: **Sandy Lean Clay (CL, A-7-6) medium plasticity, fine sand, gray**



Moisture Content		Gravel	0.0%	Liquid Limit	46
Silt & Clay (% Passing #200)	72.9%	Sand	27.1%	Plastic Limit	22
Maximum Particle Size	0	Silt	14.9%	Plastic Index	24
Specific Gravity	2.623	Clay	58.0%	Colloids	38.0%

Description of Sand & Gravel Particles: Rounded ☒ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐  
 ASTM D 422: Particle Size Analysis of Soils  
 Dispersing Agent: Sodium Hexametaphosphate: 40 g./ Liter  
 Mechanical Stirring Apparatus (A) Length of Dispersion Period: 1 min.

References: ASTM D 854: Specific Gravity of Soils  
 ASTM D 421: Dry Preparation of Soil Samples  
 ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass  
 ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils  
 ASTM D 2487: Classification of Soils for Engineering Purposes (Unified Soil Classification System)

Technical Responsibility / Position: **Trapp Harris**

Staff Professional



# SPECIFIC GRAVITY OF SOILS

Test Method A

## ASTM D-854

PROJECT NO 1611-05-386 BORING NO B-32  
 PROJECT NAME RBO South Fork Edisto & Cedar Creek SAMPLE NO 4  
 DATE 4/21/2005 DEPTH 29.4'-30.9'  
 DESCRIPTION Sandy Lean Clay (CL, A-7-6) medium plasticity, fine sand, gray  
 TESTED BY BU COMPUTED BY BU CHECKED BY BU

VOL FLASK NO <u>1</u>	VOL FLASK NO <u>        </u>	VOL FLASK NO <u>        </u>
1. WT. OF SOIL & VOL FLASK <u>82.87</u> g	1. WT. OF SOIL & VOL FLASK <u>        </u> g	1. WT. OF SOIL & VOL FLASK <u>        </u> g
2. Wt. of flask <u>62.35</u> g	2. Wt. of flask <u>        </u> g	2. Wt. of flask <u>        </u> g
A. WT. OF SOIL <u>20.52</u> g	A. WT. OF SOIL <u>0</u> g	A. WT. OF SOIL <u>        </u> g
B. WT. OF VOL. (from vol. Flask chart) FLASK & WATER <u>161.85</u> g	B. WT. OF VOL. (from vol. Flask chart) FLASK & WATER <u>        </u> g	B. WT. OF VOL. (from vol. Flask chart) FLASK & WATER <u>        </u> g
WATER TEM <u>27</u> °C	WATER TEMP. <u>        </u> °C	WATER TEMP. <u>        </u> °C
C. WT. OF VOL. FLASK, SOIL & WATER <u>174.56</u> g	C. WT. OF VOL. FLASK, SOIL & WATER <u>        </u> g	C. WT. OF VOL. FLASK, SOIL & WATER <u>        </u> g
D. SPECIFIC GRAVITY = $\frac{A}{A+(B-C)} = \frac{20.52}{20.52 + (161.85 - 174.56)} = 2.627$ g	D. SPECIFIC GRAVITY = $\frac{A}{A+(B-C)} = \frac{0}{0 + (        -        )} =$ g	D. SPECIFIC GRAVITY = $\frac{A}{A+(B-C)} = \frac{        }{        + (        -        )} =$ g

SPECIFIC GRAVITY (CORRECTED)  $G_s = D \cdot K =$

H <sub>2</sub> O TEMP. °C	CORRECTION FACTOR, K
18	1.0004
19	1.0002
20	1.0000
21	0.9998
22	0.9996
23	0.9993
24	0.9991
25	0.9989
26	0.9986
27	0.9983
28	0.9980
29	0.9977
30	0.9974

FLASK NO. 1  
 $G_s = D \cdot K = 2.623$

FLASK NO. 0  
 $G_s = D \cdot K =$

FLASK NO. 0  
 $G_s = D \cdot K =$

AVERAGE  
 $G_s =$  **2.623**





# Particle Size Analysis of Soils

ASTM D 422

Project #: 1611-04-386

Project Name: RBO South Fork Edisto River &amp; Cedar Creek

Client Name: SCDOT

Client Address: PO Box 191, Columbia, South Carolina, 29202-0191

Test Date(s): 4/13/05-4/28/05

Report Date: 5/1/05

Boring #: 32

Sample #: 4

Sample Date: Various

Location: B-32

Elevation: 29.4'-30.9'

Sample Description: Sandy Lean Clay (CL, A-7-6) medium plasticity, fine sand, gray

Particle Size Analysis / Without Hydrometer Analysis			Moisture Content		Natural
				Tare #	1
	Tare Number	1.0	A	Tare Weight	0.00
A	Tare Weight	0.0	B	Wet Weight + Tare Wt.	28.13
B	Total Sample Dry Wt. + Tare Wt.	0.0	C	Dry Weight + Tare Wt.	22.85
C	Total Sample Dry Weight (B-A)	65.74	D	Water Wt. (B-C)	5.28
D	Total Sample Wt. After #200 Wash	17.80	E	Dry Wt.(C-A)	22.85
E	Percent Passing #200 (1-D/C)x100	72.9%	Moisture Content (100 x D/E) (%)		23.1%
Sieve Size (mm)	Sieve Size	Retained Weight	Percent Retained		Percent Passing Total Sample
37.50	1.5"	0.0	0.0%		100.0%
25.00	1.0"	0.00	0.0%		100.0%
19.00	3/4"	0.00	0.0%		100.0%
12.50	1/2"	0.00	0.0%		100.0%
9.50	3/8"	0.00	0.0%		100.0%
4.75	#4	0.00	0.0%		100.0%
2.36	#8	0.00	0.0%		100.0%
1.18	#16	0.00	0.0%		100.0%
0.60	#30	0.40	0.6%		99.4%
0.30	#50	1.50	2.3%		97.1%
0.15	#100	8.00	12.2%		84.9%
0.075	#200	7.90	12.0%		72.9%

<b>Notes:</b> Maximum Particle Size			Gravel	< 75 mm and > 4.75 mm (#4)	0.0%
Apparent Relative Density			Coarse Sand	< 4.75 mm and > 2.00 mm (#10)	0.0%
Liquid Limit	46	Fineness Modulus	Medium Sand	< 2.00 mm and > 0.425 mm (#40)	0.6%
Plastic Limit	22	Cu = D60/D10:	Fine Sand	< 0.425 mm and > 0.075 mm (#200)	26.5%
Plastic Index	24	Cc =(D30) <sup>2</sup> / (D10xD60):	% Silt and Clay	< 0.075 mm	72.9%
			Description of Sand & Gravel	Rounded <input checked="" type="checkbox"/>	Angular <input checked="" type="checkbox"/>
			Hard & Durable <input checked="" type="checkbox"/>	Soft <input type="checkbox"/>	Weathered & Friable <input type="checkbox"/>

Organic Content

D10 =

D30 =

D60 =

D50 =

D90 =

ASTM D 422: Particle Size Analysis of Soils

Hydrometer portion of test method not utilized.

ASTM D 421: Dry Preparation of Soil Samples

ASTM D 854: Specific Gravity of Soils

ASTM D 4318: Liquid Limit, Plastic Limit, &amp; Plastic Index of Soils

ASTM D 2487: Classification of Soils for Engineering Purposes (Unified Soil Classification System)

Technician Name:

Brian Urban

Certification #

Technical Responsibility:

Trapp Harris

Signature

Staff Professional

Position



## Liquid Limit, Plastic Limit, and Plastic Index

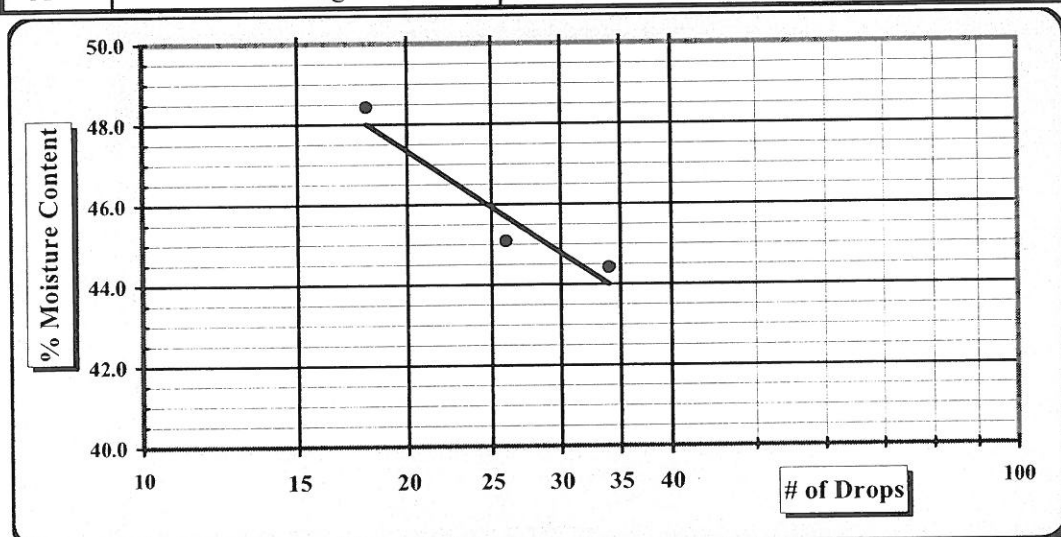
Project #: **1611-04-386**  
 Project Name: **RBO South Fork Edisto River & Cedar Creek**  
 Client Name: **SCDOT**  
 Client Address: **P.O. Box 191, Columbia, South Carolina, 29202-0191**  
 Boring #: **32** Sample #: **4** Sample Date: **Various**

Report Date: **4/26/05**  
 Test Date(s): **4/16/05-4/28/05**

Location: **B-32** Elevation: **29.4'-30.9'**

Sample Description: **Sandy Lean Clay (CL, A-7-6) medium plasticity, fine sand, gray**

Pan #	Test #	Liquid Limit						Plastic Limit		
		1	2	3	4	5	6	1	2	3
	Tare #	146	112	129				101	141	
A	Tare Weight	13.51	13.78	13.88				13.64	13.72	
B	Wet Soil Weight + A	24.82	24.85	24.87				20.18	20.45	
C	Dry Soil Weight + A	21.13	21.41	21.49				19.00	19.22	
D	Water Weight (B-C)	3.69	3.44	3.38				1.18	1.23	
E	Dry Soil Weight (C-A)	7.62	7.63	7.61				5.36	5.50	
F	% Moisture Content (D/E)*100	48.4%	45.1%	44.4%				22.0%	22.4%	
N	# OF DROPS	18	26	34				Moisture Contents determined by ASTM D 2216		
LL	LL = F * FACTOR									
Ave.	Average							22.2%		



One Point Liquid Limit			
N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.990	29	1.018
24	0.995	30	1.022
25	1.000		

Notes:

### Special Sampling Methods:

Sample Preparation:	Wet Preparation <input type="checkbox"/>	Dry Preparation <input checked="" type="checkbox"/>	Air Dried <input checked="" type="checkbox"/>	NP, Non-Plastic <input type="checkbox"/>
Liquid limit Test:	Multipoint Method <input checked="" type="checkbox"/>	One-point Method <input type="checkbox"/>		Liquid Limit <u>46</u>
Classification:	ASTM D 2487 <input type="checkbox"/>	AASHTO M 145 <input checked="" type="checkbox"/>		Plastic Limit <u>22</u>
Liquid limit Test:	ASTM D 4318 <input type="checkbox"/>	AASHTO T 89 <input checked="" type="checkbox"/>		Plastic Index <u>24</u>
Plastic limit Test:	ASTM D 4318 <input type="checkbox"/>	AASHTO T 90 <input checked="" type="checkbox"/>		Group Symbol <u>A-7-6</u>

Technician Name: **Brian Urban**

Certification #

Technical Responsibility: **Trapp Harris**

Signature

Staff Professional

Position



## Liquid Limit, Plastic Limit, and Plastic Index

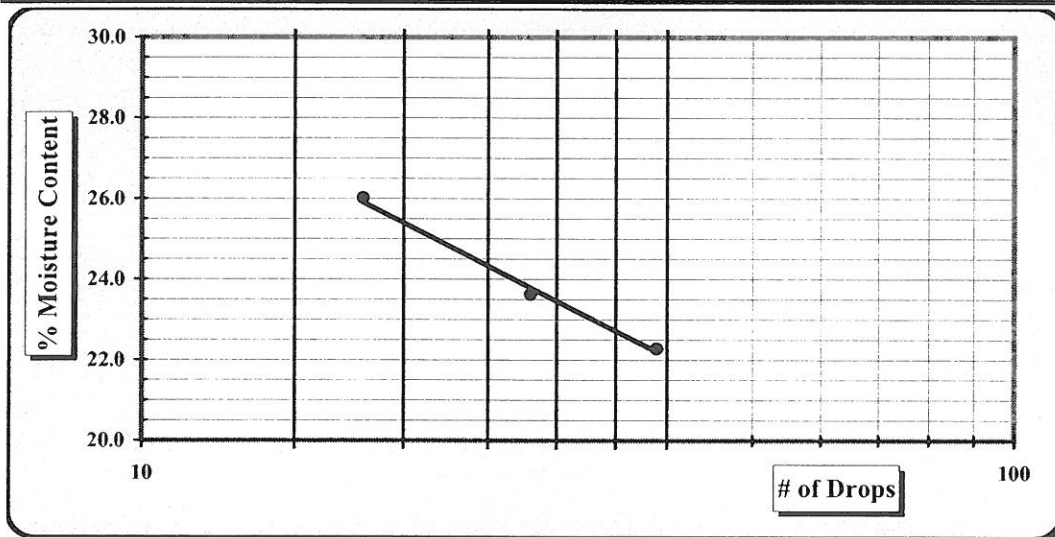
Project #: **1611-04-386**  
 Project Name: RBO South Fork Edisto River & Cedar Creek  
 Client Name: SCDOT  
 Client Address: P.O. Box 191, Columbia, South Carolina, 29202-0191  
 Boring #: 32 Sample #: 13

Report Date: 4/27/05  
 Test Date(s): 4/16/05-4/28/05

Sample Date: Various  
 Location: B-32 Elevation: 74.4'-75.9'

Sample Description: Silty Sand (SM, A-2-4) low plasticity, fine to medium sand, white and purple

Pan #		Liquid Limit						Plastic Limit		
	Test #	1	2	3	4	5	6	1	2	3
	Tare #	123	128	135				106	124	
A	Tare Weight	13.72	13.76	13.55				13.58	13.94	
B	Wet Soil Weight + A	24.62	24.28	23.32				19.63	19.10	
C	Dry Soil Weight + A	22.37	22.27	21.54				18.64	18.27	
D	Water Weight (B-C)	2.25	2.01	1.78				0.99	0.83	
E	Dry Soil Weight (C-A)	8.65	8.51	7.99				5.06	4.33	
F	% Moisture Content (D/E)*100	26.0%	23.6%	22.3%				19.6%	19.2%	
N	# OF DROPS	18	28	39				Moisture Contents determined by ASTM D 2216		
LL	LL = F * FACTOR									
Ave.	Average							19.4%		



One Point Liquid Limit			
N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.990	29	1.018
24	0.995	30	1.022
25	1.000		

Notes:

### Special Sampling Methods:

Sample Preparation:	Wet Preparation <input type="checkbox"/>	Dry Preparation <input checked="" type="checkbox"/>	Air Dried <input checked="" type="checkbox"/>	NP, Non-Plastic <input type="checkbox"/>
Liquid limit Test:	Multipoint Method <input checked="" type="checkbox"/>	One-point Method <input type="checkbox"/>		Liquid Limit <u>24</u>
Classification:	ASTM D 2487 <input type="checkbox"/>	AASHTO M 145 <input checked="" type="checkbox"/>		Plastic Limit <u>19</u>
Liquid limit Test:	ASTM D 4318 <input type="checkbox"/>	AASHTO T 89 <input checked="" type="checkbox"/>		Plastic Index <u>5</u>
Plastic limit Test:	ASTM D 4318 <input type="checkbox"/>	AASHTO T 90 <input checked="" type="checkbox"/>		Group Symbol <u>A-2-4</u>

Technician Name: Brian Urban

Certification #

Technical Responsibility: Trapp Harris

Signature

Staff Professional

Position



## Particle Size Analysis of Soils

Project #: 1611-04-386

Test Date(s): 4/13/05-4/28/05

Project Name:

RBO South Fork Edisto River &amp; Cedar Creek

Client Name:

SCDOT

Client Address:

P.O. Box 191, Columbia, South Carolina, 29202-0191

Boring #: 33

Sample #: 5

Sample Date: Various

Location: B-33

Elevation: 13.5'-15.0'

Sample Description: Silty Sand (SM, A-2-6) low plasticity, fine to medium sand, dark gray and light brown

Pan #:	11	Beaker #:	11	Specific Gravity:	2.516	Moisture Content	Hygroscopic	Natural	Sieve	Retained Wt.	Percent Passing
Hydrometer Jar #:				Pan # (washed sample):					3.0"	0.0	100.0%
Pan Tare Weight (grams):			8372						1.5"	0.0	100.0%
Total Sample Wet Wt. + tare wt. (grams):			0.00						1.0"	0.0	100.0%
Weight of Total Sample Air Dried:			115.92						3/4"	0.0	100.0%
Weight of Air Dried Hydrometer Sample (g):			115.92						1/2"	0.0	100.0%
Total Sample Oven Dried:			115.43						3/8"	0.0	100.0%
Hydrometer Sample Oven Dried (W):			115.43						#4	0.0	100.0%
% Passing #10:			100.0%						#10	0.0	100.0%
Correction Factor a (Table I):			1.03						#30	4.1	96.4%

Notes:	Description of Sand & Gravel Particles:	Rounded <input checked="" type="checkbox"/>	Angular <input checked="" type="checkbox"/>	Hard & Durable <input checked="" type="checkbox"/>	Soft <input type="checkbox"/>	Weathered & Friable <input type="checkbox"/>
Maximum Particle Size:	Total Sand: 80.4% < 4.74 mm and > 0.075 mm					
% Gravel: 0.0%	< 75 mm and > 4.75 mm					
Coarse Sand: 0.0%	< 4.75 mm and > 2.00 mm					
Medium Sand: 7.0%	< 2.00 mm and > 0.425 mm					
Fine Sand: 73.4%	< 0.425 mm and > 0.075 mm					

Time	Temp. (°C)	Corrections		Hydrometer		Percent Passing		Table 2	Table 3	Diameter D = K x (L/T) <sup>1/2</sup>
		Control Cylinder	Composite Correction	R	P(-#10) = (R x a / W) x 100	P (total) = P x % Passing #10	L			
8:51	20.6	4.0	3.8	18.0	16.1%	16.1%	13.3	0.01431	0.03690	
8:54	20.6	4.0	3.8	16.0	14.3%	14.3%	13.7	0.01431	0.02369	
9:04	20.5	4.0	3.8	15.0	13.4%	13.4%	13.8	0.01431	0.01373	
9:19	20.5	4.0	3.8	14.0	12.5%	12.5%	14.0	0.01431	0.00978	
9:49	20.5	4.0	3.8	13.0	11.6%	11.6%	14.2	0.01431	0.00696	
12:59	21.4	4.0	3.6	11.0	9.8%	9.8%	14.5	0.01414	0.00341	
8:49	21.5	4.0	3.5	8.0	7.1%	7.1%	15.0	0.01414	0.00144	
8:49	22.0	4.0	3.3	6.0	5.4%	5.4%	15.3	0.01397	0.00102	

Technician Name / Certification #		References:	
Brian Urban		ASTM D 421: Dry Preparation of Soil Samples	
		ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass	
		ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils	
		ASTM D 2487: Classification of Soils for Engineering Purposes (Unified Soil Classification System)	

Technical Responsibility: Trapp Harris

Position: Staff Professional



# Particle Size Analysis of Soils

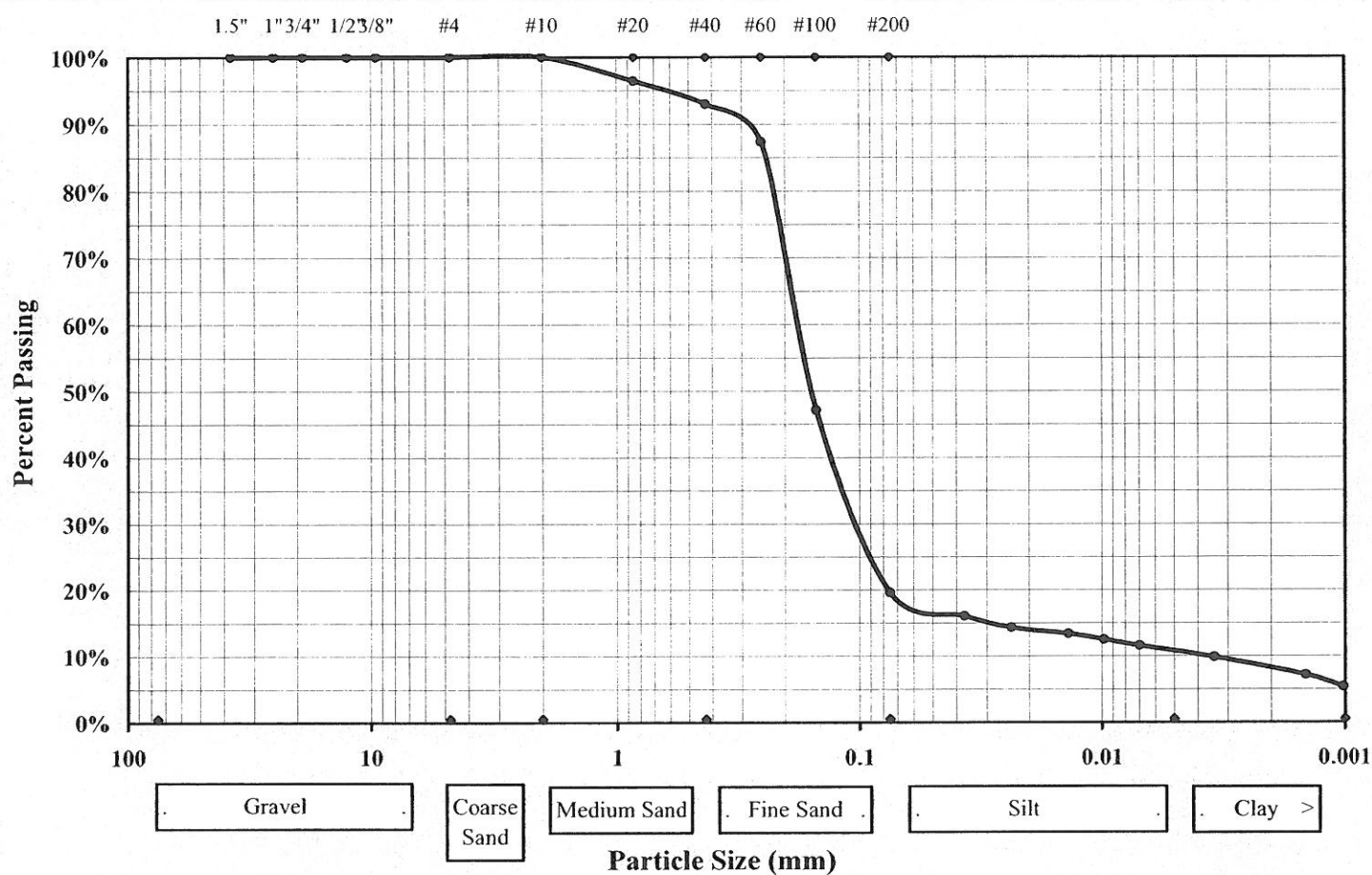
ASTM D 422



S&ME Project #: **1611-04-386**  
 Project Name: **RBO South Fork Edisto River & Cedar Creek**  
 Client Name: **SCDOT**  
 Client Address: **P.O. Box 191, Columbia, South Carolina, 29202-0191**

Report Date: **4/29/05**  
 Test Date(s): **4/13/05-4/28/05**

Boring #: **33** Sample #: **5** Sample Date: **Various**  
 Location: **B-33** Elevation: **13.5'-15.0'**  
 Sample Description: **Silty Sand (SM, A-2-6) low plasticity, fine to medium sand, dark gray and light brown**



Moisture Content		Gravel	0.0%	Liquid Limit
Silt & Clay (% Passing #200)	19.6%	Sand	80.4%	Plastic Limit
Maximum Particle Size	0	Silt	8.6%	Plastic Index
Specific Gravity	2.516	Clay	11.0%	Colloids
				5.0%

Description of Sand & Gravel Particles: Rounded ☒ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐  
 ASTM D 422: Particle Size Analysis of Soils Dispersing Agent: Sodium Hexametaphosphate: 40 g./ Liter  
 Mechanical Stirring Apparatus (A) Length of Dispersion Period: 1 min.

References: ASTM D 854: Specific Gravity of Soils  
 ASTM D 421: Dry Preparation of Soil Samples  
 ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass  
 ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils  
 ASTM D 2487: Classification of Soils for Engineering Purposes (Unified Soil Classification System)

Technical Responsibility / Position: Trapp Harris

Staff Professional



# SPECIFIC GRAVITY OF SOILS

Test Method A

## ASTM D-854

PROJECT NO 1611-05-386 BORING NO B-33  
 PROJECT NAME RBO South Fork Edisto & Cedar Creek SAMPLE NO 5  
 DATE 4/21/2005 DEPTH 13.5'-15.0'  
 DESCRIPTION Silty Sand (SM, A-2-4) low plasticity, fine to medium sand, dark gray and light brown  
 TESTED BY BU COMPUTED BY BU CHECKED BY BU

VOL FLASK NO <u>1</u>	VOL FLASK NO <u>          </u>	VOL FLASK NO <u>          </u>
1. WT. OF SOIL & VOL FLASK <u>83.09</u> g	1. WT. OF SOIL & VOL FLASK <u>          </u> g	1. WT. OF SOIL & VOL FLASK <u>          </u> g
2. Wt. of flask <u>62.35</u> g	2. Wt. of flask <u>          </u> g	2. Wt. of flask <u>          </u> g
A. WT. OF SOIL <u>20.74</u> g	A. WT. OF SOIL <u>0</u> g	A. WT. OF SOIL <u>          </u> g
B. WT. OF VOL. (from vol. Flask chart) FLASK & WATER <u>161.86</u> g	B. WT. OF VOL. (from vol. Flask chart) FLASK & WATER <u>          </u> g	B. WT. OF VOL. (from vol. Flask chart) FLASK & WATER <u>          </u> g
WATER TEM <u>27</u> °C	WATER TEMP. <u>          </u> °C	WATER TEMP. <u>          </u> °C
C. WT. OF VOL. FLASK, SOIL & WATER <u>174.37</u> g	C. WT. OF VOL. FLASK, SOIL & WATER <u>          </u> g	C. WT. OF VOL. FLASK, SOIL & WATER <u>          </u> g
D. SPECIFIC GRAVITY = $\frac{A}{A+(B-C)} = \frac{20.74}{20.74 + (161.86 - 174.37)} = 2.520$ g	D. SPECIFIC GRAVITY = $\frac{A}{A+(B-C)} = \frac{0}{0 + (          -          )} =$ g	D. SPECIFIC GRAVITY = $\frac{A}{A+(B-C)} = \frac{          }{          + (          -          )} =$ g

SPECIFIC GRAVITY (CORRECTED)  $G_s = D \cdot K =$

H <sub>2</sub> O TEMP. °C	CORRECTION FACTOR, K
18	1.0004
19	1.0002
20	1.0000
21	0.9998
22	0.9996
23	0.9993
24	0.9991
25	0.9989
26	0.9986
27	0.9983
28	0.9980
29	0.9977
30	0.9974

FLASK NO. 1  
 $G_s = D \cdot K = 2.516$

FLASK NO. 0  
 $G_s = D \cdot K =$

FLASK NO. 0  
 $G_s = D \cdot K =$

AVERAGE  
 $G_s =$  **2.516**



# Particle Size Analysis of Soils

ASTM D 422

Project #: 1611-04-386

Project Name: RBO South Fork Edisto River &amp; Cedar Creek

Client Name: SCDOT

Client Address: PO Box 191, Columbia, South Carolina, 29202-0191

Test Date(s): 4/13/05-4/28/05

Report Date: 5/1/05

Boring #: 33

Sample #: 5

Sample Date: Various

Location: B-33

Elevation: 13.5'-15.0'

Sample Description: Silty Sand (SM, A-2-4) low plasticity, fine to medium sand, dark gray and light brown

Particle Size Analysis / Without Hydrometer Analysis			Moisture Content		Natural
				Tare #	508
	Tare Number	508.0	A	Tare Weight	0.00
A	Tare Weight	0.0	B	Wet Weight + Tare Wt.	20.99
B	Total Sample Dry Wt. + Tare Wt.	0.0	C	Dry Weight + Tare Wt.	16.97
C	Total Sample Dry Weight (B-A)	115.92	D	Water Wt. (B-C)	4.02
D	Total Sample Wt. After #200 Wash	92.80	E	Dry Wt.(C-A)	16.97
E	Percent Passing #200 (1-D/C)x100	19.9%	Moisture Content (100 x D/E) (%)		23.7%
Sieve Size (mm)	Sieve Size	Retained Weight	Percent Retained		Percent Passing Total Sample
37.50	1.5"	0.0	0.0%		100.0%
25.00	1.0"	0.00	0.0%		100.0%
19.00	3/4"	0.00	0.0%		100.0%
12.50	1/2"	0.00	0.0%		100.0%
9.50	3/8"	0.00	0.0%		100.0%
4.75	#4	0.00	0.0%		100.0%
2.36	#8	0.00	0.0%		100.0%
1.18	#16	1.50	1.3%		98.7%
0.60	#30	3.80	3.3%		95.4%
0.30	#50	9.30	8.0%		87.4%
0.15	#100	46.40	40.0%		47.4%
0.075	#200	31.80	27.4%		19.9%

<b>Notes:</b> Maximum Particle Size		Gravel	< 75 mm and > 4.75 mm (#4)	0.0%
Apparent Relative Density		Coarse Sand	< 4.75 mm and > 2.00 mm (#10)	0.0%
Liquid Limit	Fineness Modulus	Medium Sand	< 2.00 mm and > 0.425 mm (#40)	4.6%
Plastic Limit	Cu = D60/D10:	Fine Sand	< 0.425 mm and > 0.075 mm (#200)	75.5%
Plastic Index	Cc = (D30) <sup>2</sup> / (D10xD60):	% Silt and Clay	< 0.075 mm	19.9%
		Description of Sand & Gravel	Rounded <input checked="" type="checkbox"/> Angular <input checked="" type="checkbox"/>	
		Hard & Durable <input checked="" type="checkbox"/> Soft <input type="checkbox"/> Weathered & Friable <input type="checkbox"/>		

Organic Content

D10 =

D30 =

D60 =

D50 =

D90 =

ASTM D 422: Particle Size Analysis of Soils

Hydrometer portion of test method not utilized.

ASTM D 421: Dry Preparation of Soil Samples

ASTM D 854: Specific Gravity of Soils

ASTM D 4318: Liquid Limit, Plastic Limit, &amp; Plastic Index of Soils

ASTM D 2487: Classification of Soils for Engineering Purposes (Unified Soil Classification System)

Technician Name:

Brian Urban

Certification #

Technical Responsibility:

Trapp Harris

Signature

Staff Professional

Position



## Particle Size Analysis of Soils

ASTM D 422

**Project #:** 1611-04-386

**Test Date(s):** 4-13-05/4/28/05

**Project Name:** RBO South Fork Edisto River & Cedar Creek

**Report Date:**
**Client Name:** SCDOT

**Client Address:** PO Box 191, Columbia, SC 29202-0191

**Boring #:** 33

**Sample #:** 16

**Sample Date:** Various

**Location:** B-33

**Elevation:** 68.5-70.0

**Sample Description:** Silty Sand (SM, A-2-4) low plasticity, fine to medium sand, white

Particle Size Analysis / Without Hydrometer Analysis			Moisture Content		Natural
			Tare #		207
	Tare Number	207.0	A	Tare Weight	0.00
A	Tare Weight	0.0	B	Wet Weight + Tare Wt.	144.44
B	Total Sample Dry Wt. + Tare Wt.	0.0	C	Dry Weight + Tare Wt.	117.33
C	Total Sample Dry Weight (B-A)	117.33	D	Water Wt. (B-C)	27.11
D	Total Sample Wt. After #200 Wash	89.70	E	Dry Wt.(C-A)	117.33
E	Percent Passing #200 (1-D/C)x100	23.5%	Moisture Content (100 x D/E) (%)		23.1%
Sieve Size (mm)	Sieve Size	Retained Weight	Percent Retained		Percent Passing Total Sample
37.50	1.5"	0.0	0.0%		100.0%
25.00	1.0"	0.00	0.0%		100.0%
19.00	3/4"	0.00	0.0%		100.0%
12.50	1/2"	0.00	0.0%		100.0%
9.50	3/8"	0.00	0.0%		100.0%
4.75	#4	0.00	0.0%		100.0%
2.36	#8	0.60	0.5%		99.5%
1.18	#16	12.50	10.7%		88.8%
0.60	#30	27.30	23.3%		65.6%
0.30	#50	26.40	22.5%		43.1%
0.15	#100	19.10	16.3%		26.8%
0.075	#200	3.80	3.2%		23.5%

<b>Notes:</b>		Maximum Particle Size	Gravel	< 75 mm and > 4.75 mm (#4)	0.0%
		Apparent Relative Density	Coarse Sand	< 4.75 mm and > 2.00 mm (#10)	0.5%
Liquid Limit	24	Fineness Modulus	Medium Sand	< 2.00 mm and > 0.425 mm (#40)	33.9%
Plastic Limit	18	Cu = D60/D10:	Fine Sand	< 0.425 mm and > 0.075 mm (#200)	42.0%
Plastic Index	6	Cc = (D30) <sup>2</sup> / (D10xD60):	% Silt and Clay	< 0.075 mm	23.5%
			Description of Sand & Gravel	Rounded <input checked="" type="checkbox"/>	Angular <input checked="" type="checkbox"/>
			Hard & Durable <input checked="" type="checkbox"/>	Soft <input type="checkbox"/>	Weathered & Friable <input type="checkbox"/>

Organic Content

D10 =

D30 =

D60 =

D50 =

D90 =

ASTM D 422: Particle Size Analysis of Soils

Hydrometer portion of test method not utilized.

ASTM D 421: Dry Preparation of Soil Samples

ASTM D 854: Specific Gravity of Soils

ASTM D 4318: Liquid Limit, Plastic Limit, &amp; Plastic Index of Soils

ASTM D 2487: Classification of Soils for Engineering Purposes (Unified Soil Classification System)

**Technician Name:**
Brian Urban

Certification #

**Technical Responsibility:**
Trapp Harris

Signature

**Staff Professional**

Position





## Liquid Limit, Plastic Limit, and Plastic Index

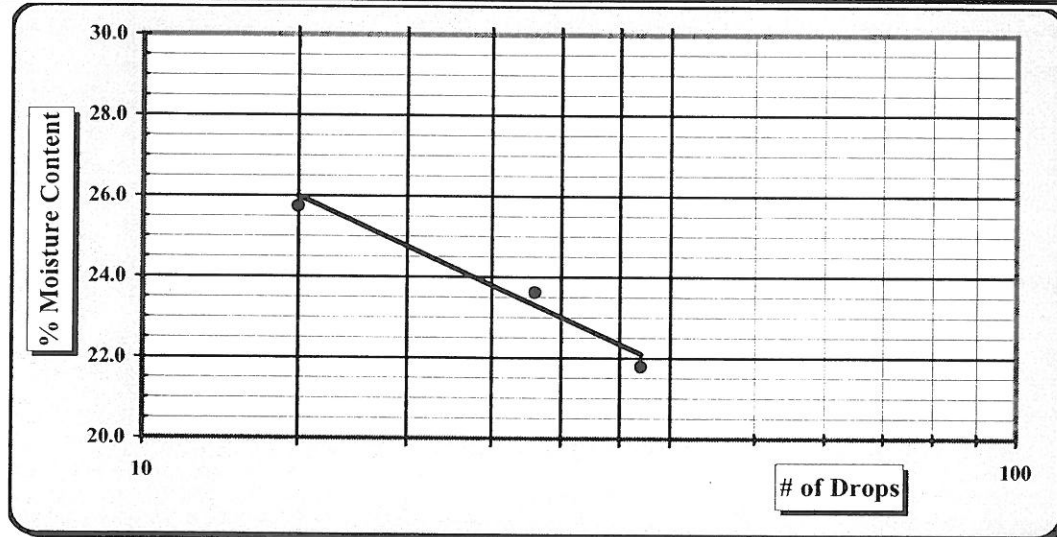
Project #: **1611-04-386**  
 Project Name: **RBO South Fork Edisto River & Cedar Creek**  
 Client Name: **SCDOT**  
 Client Address: **P.O. Box 191, Columbia, South Carolina, 29202-0191**  
 Boring #: **33** Sample #: **16**

Report Date: **4/26/05**  
 Test Date(s): **4/16/05-4/28/05**

Location: **B-33** Elevation: **68.5'-70.0'**

Sample Description: **Silty Sand (SM, A-2-4) low plasticity, fine to medium sand, white**

Pan #		Liquid Limit						Plastic Limit		
	Test #	1	2	3	4	5	6	1	2	3
	Tare #	126	104	136				105	122	
A	Tare Weight	13.77	13.70	13.75				13.63	13.72	
B	Wet Soil Weight + A	23.98	23.54	23.03				18.68	18.19	
C	Dry Soil Weight + A	21.89	21.66	21.37				17.91	17.48	
D	Water Weight (B-C)	2.09	1.88	1.66				0.77	0.71	
E	Dry Soil Weight (C-A)	8.12	7.96	7.62				4.28	3.76	
F	% Moisture Content (D/E)*100	25.7%	23.6%	21.8%				18.0%	18.9%	
N	# OF DROPS	15	28	37				Moisture Contents determined by ASTM D 2216		
LL	LL = F * FACTOR									
Ave.	Average							18.4%		



One Point Liquid Limit			
N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.990	29	1.018
24	0.995	30	1.022
25	1.000		

Notes:

### Special Sampling Methods:

Sample Preparation:	Wet Preparation <input type="checkbox"/>	Dry Preparation <input checked="" type="checkbox"/>	Air Dried <input checked="" type="checkbox"/>	NP, Non-Plastic <input type="checkbox"/>
Liquid limit Test:	Multipoint Method <input checked="" type="checkbox"/>	One-point Method <input type="checkbox"/>		Liquid Limit <u>24</u>
Classification:	ASTM D 2487 <input type="checkbox"/>	AASHTO M 145 <input checked="" type="checkbox"/>		Plastic Limit <u>18</u>
Liquid limit Test:	ASTM D 4318 <input type="checkbox"/>	AASHTO T 89 <input checked="" type="checkbox"/>		Plastic Index <u>6</u>
Plastic limit Test:	ASTM D 4318 <input type="checkbox"/>	AASHTO T 90 <input checked="" type="checkbox"/>		Group Symbol <u>A-4</u>

Technician Name: Brian Urban

Technical Responsibility: Trapp Harris

Certification #

Signature

Staff Professional

Position



## Particle Size Analysis of Soils

ASTM D 422

**Project #:** 1611-04-386

**Test Date(s):** 4/13/05-4/28/05

**Project Name:** RBO South Fork Edisto River & Cedar Creek

**Report Date:**
**Client Name:** SCDOT

**Client Address:** PO Box 191, Columbia, SC 29202-0191

**Boring #:** 34

**Sample #:** 2

**Sample Date:** Various

**Location:** B-34

**Elevation:** 3.5'-5.0'

**Sample Description:** Clayey Sand (SC, A-2-6) low plasticity, fine to medium sand, brown and orange

Particle Size Analysis / Without Hydrometer Analysis			Moisture Content		Natural
				Tare #	212
	Tare Number	212.0	A	Tare Weight	0.00
A	Tare Weight	0.0	B	Wet Weight + Tare Wt.	155.53
B	Total Sample Dry Wt. + Tare Wt.	0.0	C	Dry Weight + Tare Wt.	134.51
C	Total Sample Dry Weight (B-A)	134.51	D	Water Wt. (B-C)	21.02
D	Total Sample Wt. After #200 Wash	103.20	E	Dry Wt.(C-A)	134.51
E	Percent Passing #200 (1-D/C)x100	23.3%	Moisture Content (100 x D/E) (%)		15.6%
Sieve Size (mm)	Sieve Size	Retained Weight	Percent Retained		Percent Passing Total Sample
37.50	1.5"	0.0	0.0%		100.0%
25.00	1.0"	0.00	0.0%		100.0%
19.00	3/4"	0.00	0.0%		100.0%
12.50	1/2"	0.00	0.0%		100.0%
9.50	3/8"	0.00	0.0%		100.0%
4.75	#4	2.70	2.0%		98.0%
2.36	#8	1.60	1.2%		96.8%
1.18	#16	5.20	3.9%		92.9%
0.60	#30	12.80	9.5%		83.4%
0.30	#50	25.80	19.2%		64.2%
0.15	#100	32.60	24.2%		40.0%
0.075	#200	22.50	16.7%		23.3%
<b>Notes:</b>		Maximum Particle Size	Gravel	< 75 mm and > 4.75 mm (#4) 2.0%	
		Apparent Relative Density	Coarse Sand	< 4.75 mm and > 2.00 mm (#10) 1.2%	
Liquid Limit	37	Fineness Modulus	Medium Sand	< 2.00 mm and > 0.425 mm (#40) 13.4%	
Plastic Limit	20	Cu = D60/D10:	Fine Sand	< 0.425 mm and > 0.075 mm (#200) 60.1%	
Plastic Index	17	Cc = (D30) <sup>2</sup> / (D10xD60):	% Silt and Clay	< 0.075 mm 23.3%	
			Description of Sand & Gravel	Rounded <input checked="" type="checkbox"/>	Angular <input checked="" type="checkbox"/>
			Hard & Durable <input checked="" type="checkbox"/>	Soft <input type="checkbox"/>	Weathered & Friable <input type="checkbox"/>

Organic Content

D10 =

D30 =

D60 =

D50 =

D90 =

ASTM D 422: Particle Size Analysis of Soils

Hydrometer portion of test method not utilized.

ASTM D 421: Dry Preparation of Soil Samples

ASTM D 854: Specific Gravity of Soils

ASTM D 4318: Liquid Limit, Plastic Limit, &amp; Plastic Index of Soils

ASTM D 2487: Classification of Soils for Engineering Purposes (Unified Soil Classification System)

**Technician Name:**
Brian Urban

Certification #

**Technical Responsibility:**
Trapp Harris

Signature

**Staff Professional**

Position



## Liquid Limit, Plastic Limit, and Plastic Index

Project #: **1611-04-386**  
 Project Name: **RBO South Fork Edisto River & Cedar Creek**  
 Client Name: **SCDOT**  
 Client Address: **P.O. Box 191, Columbia, South Carolina, 29202-0191**  
 Boring #: **34** Sample #: **2**  
 Location: **B-34**

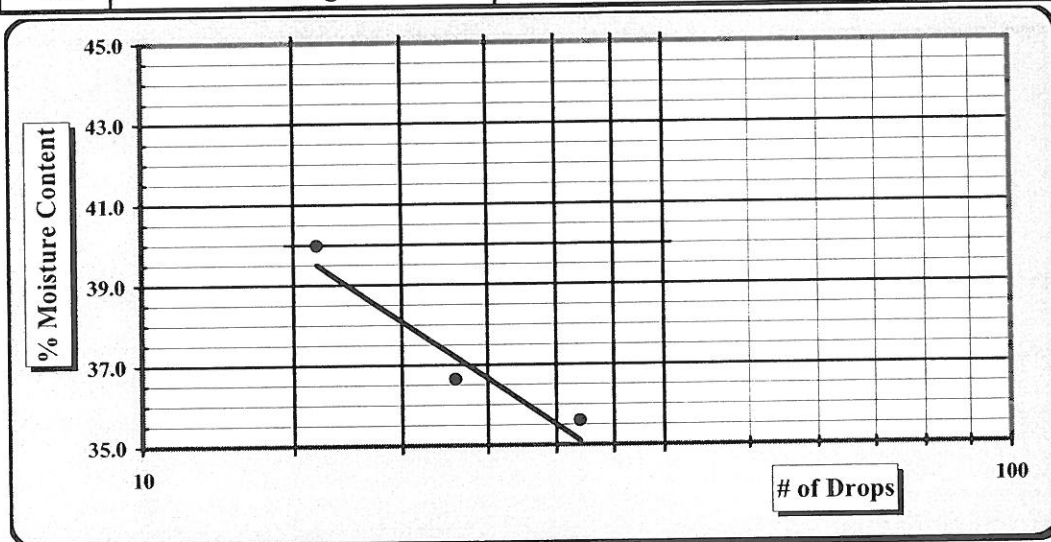
Report Date: **4/26/05**  
 Test Date(s): **4/16/05-4/28/05**

Sample Date: **Various**

Elevation: **3.5'-5.0'**

Sample Description: **Clayey Sand (SC, A-2-6) low plasticity, fine to medium sand, brown and orange**

Pan #	Test #	Liquid Limit						Plastic Limit		
		1	2	3	4	5	6	1	2	3
	Tare #	109	128	135				124	102	
A	Tare Weight	13.76	13.76	13.56				13.95	13.79	
B	Wet Soil Weight + A	26.40	25.06	23.96				18.99	18.72	
C	Dry Soil Weight + A	22.79	22.03	21.23				18.15	17.93	
D	Water Weight (B-C)	3.61	3.03	2.73				0.84	0.79	
E	Dry Soil Weight (C-A)	9.03	8.27	7.67				4.20	4.14	
F	% Moisture Content (D/E)*100	40.0%	36.6%	35.6%				20.0%	19.1%	
N	# OF DROPS	16	23	32				Moisture Contents determined by ASTM D 2216		
LL	LL = F * FACTOR									
Ave.	Average							19.5%		



One Point Liquid Limit			
N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.990	29	1.018
24	0.995	30	1.022
25	1.000		

Notes:

Special Sampling Methods:

Sample Preparation:	Wet Preparation <input type="checkbox"/>	Dry Preparation <input checked="" type="checkbox"/>	Air Dried <input checked="" type="checkbox"/>	NP, Non-Plastic <input type="checkbox"/>
Liquid limit Test:	Multipoint Method <input checked="" type="checkbox"/>	One-point Method <input type="checkbox"/>		Liquid Limit <u>37</u>
Classification:	ASTM D 2487 <input type="checkbox"/>	AASHTO M 145 <input checked="" type="checkbox"/>		Plastic Limit <u>20</u>
Liquid limit Test:	ASTM D 4318 <input type="checkbox"/>	AASHTO T 89 <input checked="" type="checkbox"/>		Plastic Index <u>17</u>
Plastic limit Test:	ASTM D 4318 <input type="checkbox"/>	AASHTO T 90 <input checked="" type="checkbox"/>		Group Symbol <u>A-2-6</u>

Technician Name: Brian Urban

Certification #

Technical Responsibility: Trapp Harris

Signature

Staff Professional

Position



## Particle Size Analysis of Soils

ASTM D 422

**Project #:** 1611-04-386

**Project Name:** RBO South Fork Edisto River & Cedar Creek

**Client Name:** SCDOT

**Client Address:** PO Box 191, Columbia, SC 29202-0191

**Test Date(s):** 4/13/05-4/28/05

**Report Date:**
**Boring #:** 35

**Sample #:** 3

**Sample Date:**
**Various**
**Location:** B-35

**Elevation:**
**6.0'-7.5'**
**Sample Description:** Silty Sand (SM, A-2-4) low plasticity, fine to medium sand, brown

Particle Size Analysis / Without Hydrometer Analysis			Moisture Content		Natural
				Tare #	302
	Tare Number	302.0	A	Tare Weight	0.00
A	Tare Weight	0.0	B	Wet Weight + Tare Wt.	174.91
B	Total Sample Dry Wt. + Tare Wt.	0.0	C	Dry Weight + Tare Wt.	154.70
C	Total Sample Dry Weight (B-A)	154.70	D	Water Wt. (B-C)	20.21
D	Total Sample Wt. After #200 Wash	131.00	E	Dry Wt.(C-A)	154.70
E	Percent Passing #200 (1-D/C)x100	15.3%	Moisture Content (100 x D/E) (%)		13.1%
Sieve Size (mm)	Sieve Size	Retained Weight	Percent Retained		Percent Passing Total Sample
37.50	1.5"	0.0	0.0%		100.0%
25.00	1.0"	0.00	0.0%		100.0%
19.00	3/4"	0.00	0.0%		100.0%
12.50	1/2"	0.00	0.0%		100.0%
9.50	3/8"	0.00	0.0%		100.0%
4.75	#4	0.00	0.0%		100.0%
2.36	#8	1.70	1.1%		98.9%
1.18	#16	6.30	4.1%		94.8%
0.60	#30	21.00	13.6%		81.3%
0.30	#50	39.10	25.3%		56.0%
0.15	#100	39.50	25.5%		30.4%
0.075	#200	23.40	15.1%		15.3%

<b>Notes:</b> Maximum Particle Size		Gravel	< 75 mm and > 4.75 mm (#4)	0.0%
Apparent Relative Density		Coarse Sand	< 4.75 mm and > 2.00 mm (#10)	1.1%
Liquid Limit	16	Medium Sand	< 2.00 mm and > 0.425 mm (#40)	17.6%
Plastic Limit	13	Fine Sand	< 0.425 mm and > 0.075 mm (#200)	65.9%
Plastic Index	3	% Silt and Clay	< 0.075 mm	15.3%
		Description of Sand & Gravel		
		Rounded <input checked="" type="checkbox"/> Angular <input checked="" type="checkbox"/>		
		Hard & Durable <input checked="" type="checkbox"/> Soft <input type="checkbox"/> Weathered & Friable <input type="checkbox"/>		

Organic Content

D10 =

D30 =

D60 =

D50 =

D90 =

ASTM D 422: Particle Size Analysis of Soils

Hydrometer portion of test method not utilized.

ASTM D 421: Dry Preparation of Soil Samples

ASTM D 854: Specific Gravity of Soils

ASTM D 4318: Liquid Limit, Plastic Limit, &amp; Plastic Index of Soils

ASTM D 2487: Classification of Soils for Engineering Purposes (Unified Soil Classification System)

**Technician Name:**
Brian Urban

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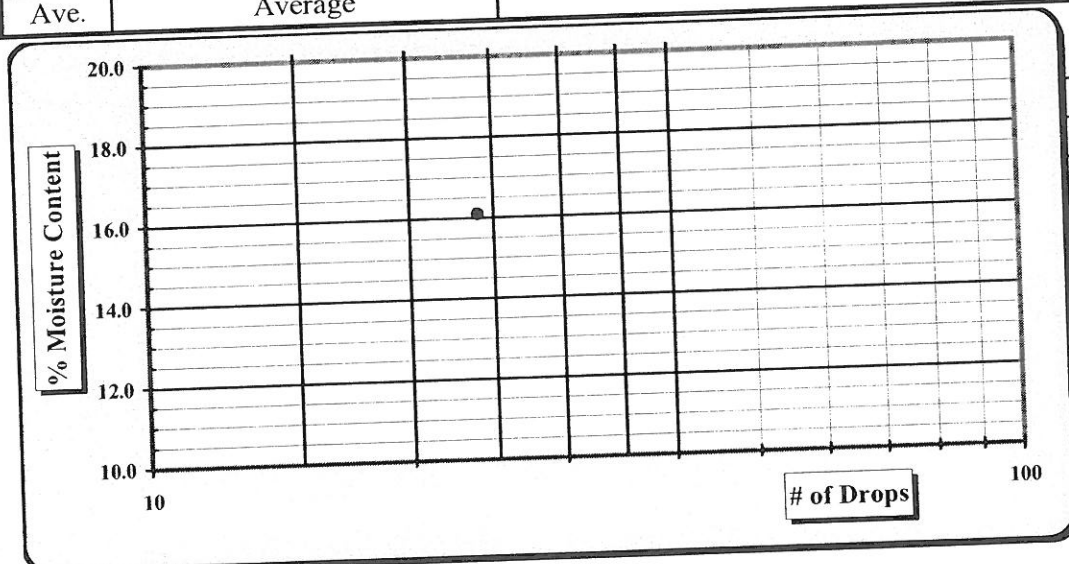
# Liquid Limit, Plastic Limit, and Plastic Index

Project #: **1611-04-386**  
 Project Name: **RBO South Fork Edisto River & Cedar Creek**  
 Client Name: **SCDOT**  
 Client Address: **P.O. Box 191, Columbia, South Carolina, 29202-0191**  
 Boring #: **35** Sample #: **3**

Report Date: **4/26/05**  
 Test Date(s): **4/16/05-4/28/05**

Location: **B-35** Elevation: **6.0'-7.5'**  
 Sample Description: **Silty Sand (SM, A-2-4) low plasticity, fine to medium sand, brown**

Pan #	Test #	Liquid Limit						Plastic Limit		
		1	2	3	4	5	6	1	2	3
	Tare #		114					112	107	
	Tare Weight		13.82					13.79	13.62	
A								19.50	19.55	
B	Wet Soil Weight + A		26.59					18.81	18.88	
C	Dry Soil Weight + A		24.82					0.69	0.67	
D	Water Weight (B-C)		1.77					5.02	5.26	
E	Dry Soil Weight (C-A)		11.00					13.7%	12.7%	
F	% Moisture Content (D/E)*100		16.1%					Moisture Contents determined by ASTM D 2216		
N	# OF DROPS		24							
LL	LL = F * FACTOR		16.0%					13.2%		
Ave.	Average									



One Point Liquid Limit			
N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.990	29	1.018
24	0.995	30	1.022
25	1.000		

Notes:

## Special Sampling Methods:

Sample Preparation:	Wet Preparation <input type="checkbox"/>	Dry Preparation <input checked="" type="checkbox"/>	Air Dried <input checked="" type="checkbox"/>	NP, Non-Plastic <input type="checkbox"/>
Liquid limit Test:	Multipoint Method <input checked="" type="checkbox"/>	One-point Method <input type="checkbox"/>		Liquid Limit <u>16</u>
Classification:	ASTM D 2487 <input type="checkbox"/>	AASHTO M 145 <input checked="" type="checkbox"/>		Plastic Limit <u>13</u>
Liquid limit Test:	ASTM D 4318 <input type="checkbox"/>	AASHTO T 89 <input checked="" type="checkbox"/>		Plastic Index <u>3</u>
Plastic limit Test:	ASTM D 4318 <input type="checkbox"/>	AASHTO T 90 <input checked="" type="checkbox"/>		Group Symbol <u>A-2-4</u>

Technician Name: Brian Urban

Certification #

Technical Responsibility: Trapp Harris

Signature

Staff Professional Position