Geotechnical Exploration
Town of Summerville Pond Exploration
Summerville, South Carolina
S&ME Project No. 1413-20-100

PREPARED FOR:

Town of Summerville
200 South Main Street
Summerville, South Carolina 29483

PREPARED BY:

S&ME, Inc.
620 Wando Park Boulevard
Mount Pleasant, SC 29464

January 6, 2020

January 6, 2020

Town of Summerville
200 South Main Street
Summerville, South Carolina 29483

Attention: Mr. Russell Cornette, Jr., P.E.

Reference: **Geotechnical Exploration**
Town of Summerville Pond Exploration
Summerville, South Carolina
S&ME Project No. 1413-20-100

Dear Mr. Cornette:

We have completed the geotechnical exploration for the new retention pond in Summerville, South Carolina. Our services were performed pursuant to S&ME Proposal No. 14-2000295 dated November 23, 2020. The purpose of our geotechnical exploration was to explore the site and provide data on the existing soils within the proposed retention pond area. This report presents our understanding of the proposed retention pond, the project site and the subsurface conditions encountered.

♦ Project Information

We understand the Town of Summerville is planning a drainage improvement project that includes a new 2.6-acre retention pond near the intersection of Parkwood Drive and Dorns Way Rd. The subject site is located at Dorchester County TMS No. 137-13-05-001. The new pond will be approximately 16 ft deep and will require excavating approximately 35,000 cubic yards of soil. Prior to bidding the project, the Town would like to know what the subsurface conditions are and if there is a potential to re-use the excavated soil as fill. Accordingly, the Town has asked S&ME to perform a soil boring within the limits of the proposed pond.

Project information was provided by Mr. Russell W. Cornette, Jr. with the Town of Summerville to Mr. Melvin C. Williams with S&ME in an e-mail on November 20, 2020.

The project information and assumptions presented above should be reviewed and confirmed by the appropriate team members. Modifications to our recommendations may be required if conditions vary substantially from the project information and assumptions stated herein.

♦ Methods of Exploration

Field Testing

Our exploration included a site reconnaissance by a geotechnical engineer and the performance of one soil test boring to a depth of approximately 20 ft below the existing ground surface. The boring was advanced using mud-

rotary techniques, and 2-ft split-spoon sampling and Standard Penetration Testing (N values) were performed continuously to the target depth. Representative split-spoon samples were collected and placed in sealed containers and transported to our laboratory for index testing and visual classification using the Unified Soil Classification System (USCS).

The approximate test location is shown on the Test Location Plan (Figure 1) in the Appendix. A more detailed description of our field-testing procedure, and the boring log are also included in the Appendix.

Laboratory Testing

Index property testing (i.e., grain-size analysis, moisture content, and Atterberg limits) was performed on five soil samples to confirm our visual classifications. Laboratory testing was performed in accordance with applicable ASTM standards, and a summary of the laboratory test data and the individual laboratory data sheets are included in the Appendix.

♦ Site and Subsurface Conditions

Site Conditions

The site is located on the corner of Parkwood Drive and Dorns Way Road in Summerville, South Carolina. The southern portion of the site has been cleared of the low-lying vegetation and now consists of widely spaced large trees. The northern portion of the site has not been cleared and consists of large trees and dense vegetation. At the time of our exploration, the site was wet and ponded water was observed in multiple areas. Based on the site visit, the property is relatively flat.

Subsurface Conditions

Details of the subsurface conditions encountered by the boring are shown on the log in the Appendix. This log represents our interpretation of the subsurface conditions based upon field data. Stratification lines on the boring log represent approximate boundaries between soil types; however, the actual transition may be gradual. The general subsurface conditions and their pertinent characteristics are discussed in the following paragraph.

The exploration initially encountered approximately 5 in. of topsoil. Beneath the topsoil we encountered natural Coastal Plain deposits consisting of loose sand to a depth of approximately 2 ft followed by loose clayey sand to a depth of approximately 6 ft below existing ground surface. From this depth stiff sandy clay was encountered to an approximate depth of 8 ft and was underlain by soft to firm silt, which extended to the furthest explored depth of approximately 20 ft.

Groundwater

Groundwater was measured 24 hours after the completion of the boring at a depth of 7½ ft below the existing ground surface. Groundwater at the site will fluctuate during the year due to seasonal and climatic variations and with construction activity in the area. And as noted, ponded water was observed on portions of the site so perched water should be anticipated.

♦ Limitations of Report

This data report has been prepared in accordance with generally accepted geotechnical engineering practice for specific application to this project. The findings contained in this report are based upon applicable standards of our practice in this geographic area at the time this report was prepared. No other representation or warranty either express or implied, is made.

We relied on project information given to us to develop our findings. If project information described in this report is not accurate, or if it changes during project development, we should be notified of the changes so that we can modify our findings based on this additional information if necessary.

Our findings are based on limited data from a field exploration program. Subsurface conditions can vary widely between explored areas. Some variations may not become evident until construction. If conditions are encountered which appear different than those described in our report, we should be notified. This report should not be construed to represent subsurface conditions for the entire site.

Unless specifically noted otherwise, our field exploration program did not include an assessment of regulatory compliance, environmental conditions or pollutants or presence of any biological materials (mold, fungi, bacteria). If there is a concern about these items, other studies should be performed. S&ME can provide a proposal and perform these services if requested.

♦ Closure

S&ME appreciates the opportunity to be of service on this project. If you have any questions concerning this report, please call.

Sincerely,

S&ME, Inc.

SOUTH CAROLINA
S&ME, INC.
C00473
CERTIFICATE OF AUTHORIZATION

SOUTH CAROLINA
REGISTERED PROFESSIONAL ENGINEER
No. 24562
WILLIAM M. CAMP, III

William Camp III
Jan 6 2021 11:53 AM

DocuSign

Andre N. Kruk, EIT
Geotechnical Staff Professional

William M. Camp, III, PE, D.GE
Technical Principal/Vice President

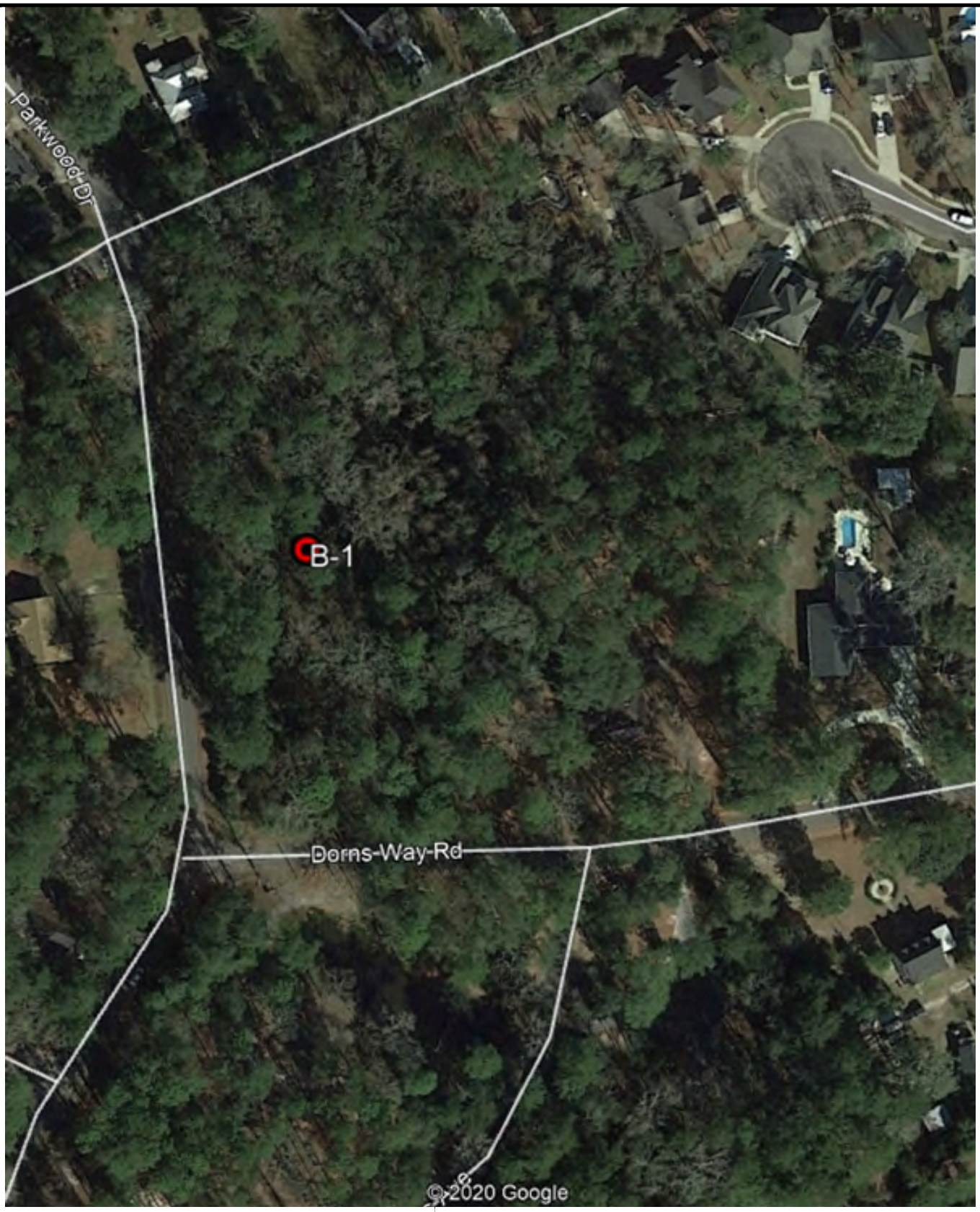
Appendix

Test Location Plan

Soil Test Boring Log

Lab Test Results

Field and Lab Testing Procedures



Test location is approximate. This plan should not be used for design or construction.

LEGEND

Soil Test Boring Location

	TEST LOCATION PLAN	SCALE: Not to Scale	FIGURE NO.
		DATE: 1/5/21	**1**
	Town of Summerville Pond Summerville, South Carolina	PROJECT NUMBER 1413-20-100	

PROJECT:	Town of Summerville Pond Exploration Summerville, South Carolina S&ME Project No. 1413-20-100	BORING LOG	B-1

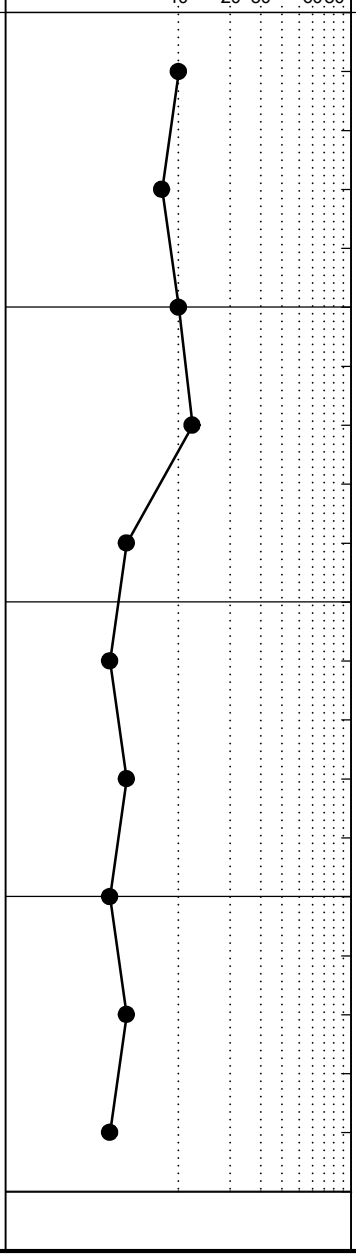
DATE DRILLED: **12/17/20**	ELEVATION:	NOTES:
DRILL RIG: **CME 45C**	BORING DEPTH: **20.0 ft**	
DRILLER: **SCI**	WATER LEVEL: **7.5' 24 hr**	
HAMMER TYPE: **Automatic**	LOGGED BY: **A. Kruk**	
SAMPLING METHOD: **Split spoon**	NORTHING:	EASTING:
DRILLING METHOD: **Mud Rotary**		

DEPTH (feet)	MATERIAL DESCRIPTION	SAMPLE NO.	BLOW COUNT / CORE DATA 1st 6in / RUN #	2nd 6in / REC	3rd 6in / RQD	N VALUE
	TOPSOIL - SAND WITH SILT (SP-SM) - moist, dark brownish gray, mostly fine sand, few non-plastic fines, few roots and wood pieces.	1	5	5	5	10
	POORLY GRADED SAND (SP) - loose, moist, yellowish brown, fine.	2	3	4	4	8
5	**CLAYEY SAND (SC)** - loose, moist, dark yellowish brown with yellow, mostly fine sand, some medium plasticity fines. Wc = 24.1% -200 = 44.2% LL = 42 PI = 20	3	5	5	5	10
	SANDY FAT CLAY (CH) - stiff, moist, gray with yellow, mostly high-plasticity fines, some fine sand. Wc = 28.7% -200 = 55.9% LL = 56 PI = 30	4	5	6	6	12
10	**SILT WITH SAND (ML)** - soft to firm, wet, yellowish gray, mostly medium plasticity fines, few fine sand. Wc = 45.4% -200 = 79.4% LL = 50 PI = 14	5	2	2	3	5
		6	1	2	2	4
		7	2	3	2	5
15		8	2	2	2	4
	SILT (ML) - soft to firm, wet, greenish gray, mostly medium plasticity fines, trace fine sand. Wc = 38.4% -200 = 85.9% Wc = 42.6% -200 = 95.2% LL = 41 PI = 15	9	3	3	2	5
		10	2	2	2	4
20	Boring terminated at 20 ft					

WATER LEVEL: ▼ (at sample 4)

SAMPLE TYPE: Split spoon

STANDARD PENETRATION TEST DATA (blows/ft) / REMARKS



NOTES:

1. *THIS LOG IS ONLY A PORTION OF A REPORT PREPARED FOR THE NAMED PROJECT AND MUST ONLY BE USED TOGETHER WITH THAT REPORT.*
2. *BORING, SAMPLING AND PENETRATION TEST DATA IN GENERAL ACCORDANCE WITH ASTM D-1586.*
3. *STRATIFICATION AND GROUNDWATER DEPTHS ARE NOT EXACT.*
4. *WATER LEVEL IS AT TIME OF EXPLORATION AND WILL VARY.*

Summary of Laboratory Test Data

Town of Summerville Pond
Summerville, South Carolina
S&ME Project No. 1413-20-100

Sample Location	Sample Depth (feet)	USCS Symbol	Natural Moisture (%)	% Finer #200	Liquid Limit LL (%)	Plasticity Index PI (%)
B-1	4	SC	24.1	44.2	42	20
B-1	6	CH	28.7	55.9	56	30
B-1	10	MH	45.4	79.4	50	14
B-1	16	MH	38.4	89.5	-	-
B-1	18	ML	42.6	95.2	41	15

Form No: TR-D1140-2
Revision No. 1
Revision Date: 8/2/17

MATERIAL FINER THAN THE #200 SIEVE

ASTM D1140

S&ME, Inc. - Charleston: 620 Wando Park Boulevard, Mt. Pleasant, SC 29464

Project #:	1413-20-100	Report Date:	1-4-2021
Project Name:	Town Summerville Pond Exploration	Test Date(s):	12-23-2020
Client Name:	Town of Summerville		
Client Address:	200 South Main Street: Summerville, SC 29483		
Sample by:	AK	Sample Dates:	12-17-2020
Sampling Method:	Split Spoon	Drill Rig :	

Boring No.	B-1	Sample No.	#4	Sample Depth:	6.0 FT
Sample Description	CLAYEY SAND (SC)				
☐ *Auxiliary*		*#200 Wash*	Method A ☐	Method B ☐	
	Tare #:	86	Soaked ☒	*Soak Time*	24 hrs.
	Tare Wt. (T)	61.00	Original Dry Mass of Sample (B)		**257.73**
	Wet Wt + T	392.75	After 200 Wash + Tare Wt. (C_T)		174.71
	Dry Wt + T	318.73	Dry Mass Retained on #200 Sieve (C)		**113.71**
	Moisture Content (MC)	**28.7%**	**% Passing #200 Sieve (A)**		**55.9%**

Boring No.	B-1	Sample No.	#9	Sample Depth:	16.0 FT
Sample Description	SILT (ML)				
☐ *Auxiliary*		*#200 Wash*	Method A ☒	Method B ☐	
	Tare #:	89	Soaked ☐	*Soak Time*	24 hrs.
	Tare Wt. (T)	60.60	Original Dry Mass of Sample (B)		**199.62**
	Wet Wt (W) + T	336.97	After 200 Wash + Tare Wt. (C_T)		88.76
	Dry Wt (D) + T	260.22	Dry Mass Retained on #200 Sieve (C)		**28.16**
	Moisture Content (MC)	**38.4%**	**% Passing #200 Sieve (A)**		**85.9%**

Boring No.	B-1	Sample No.	#6	Sample Depth:	10.0 FT
Sample Description	SILT WITH SAND (ML)				
☐ *Auxiliary*		*#200 Wash*	Method A ☐	Method B ☐	
	Tare #:	96	Soaked ☐	*Soak Time*	24 hrs.
	Tare Wt. (T)	60.33	Original Dry Mass of Sample (B)		**211.42**
	Wet Wt (W) + T	367.82	After 200 Wash + Tare Wt. (C_T)		103.87
	Dry Wt (D) + T	271.75	Dry Mass Retained on #200 Sieve (C)		**43.54**
	Moisture Content (MC)	**45.4%**	**% Passing #200 Sieve (A)**		**79.4%**

Balance ID. *06976* *Calibration Date:* *1-7-20* *#200 Sieve* *10712* *Calibration Date:* *12-2-19*

Notes / Deviations / References: ASTM D1140: Amount of Material in Soil Finer Than the No. 200 (75-um)) Sieve

ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

% Passing #200 = A = [(B-C)/B] * 100

Kim Gonzalez		Nicet II	1/4/2021
Technician Name	*Signature*	*Certification Type/No.*	*Date*
Talon Wagenknecht		Group Leader	1/4/2021
Technical Responsibility	*Signature*	*Position*	*Date*

Form No: TR-D1140-2
Revision No. 1
Revision Date: 8/2/17

MATERIAL FINER THAN THE #200 SIEVE

ASTM D1140

S&ME, Inc. - Charleston: 620 Wando Park Boulevard, Mt. Pleasant, SC 29464

Project #:	1413-20-100	Report Date:	1-4-2021
Project Name:	Town Summerville Pond Exploration	Test Date(s):	12-23-2020
Client Name:	Town of Summerville		
Client Address:	200 South Main Street: Summerville, SC 29483		
Sample by:	AK	Sample Dates:	12-17-2020
Sampling Method:	Split Spoon	Drill Rig :	

Boring No.	B-1	Sample No.	#3	Sample Depth:	4.0 FT
Sample Description	CLAYEY SAND (SC)				
☐ *Auxiliary*		*#200 Wash*	Method A ☐	Method B ☐	
	Tare #:	13	Soaked ☒	*Soak Time*	24 hrs.
	Tare Wt. (T)	60.17	Original Dry Mass of Sample (B)		**262.33**
	Wet Wt + T	385.71	After 200 Wash + Tare Wt. (C_T)		206.53
	Dry Wt + T	322.50	Dry Mass Retained on #200 Sieve (C)		**146.36**
	Moisture Content (MC)	**24.1%**	**% Passing #200 Sieve (A)**		**44.2%**

Boring No.	B-1	Sample No.	#10	Sample Depth:	18.0 FT
Sample Description	SILT (ML)				
☐ *Auxiliary*		*#200 Wash*	Method A ☒	Method B ☐	
	Tare #:	AB	Soaked ☐	*Soak Time*	24 hrs.
	Tare Wt. (T)	61.44	Original Dry Mass of Sample (B)		**214.21**
	Wet Wt (W) + T	366.92	After 200 Wash + Tare Wt. (C_T)		71.77
	Dry Wt (D) + T	275.65	Dry Mass Retained on #200 Sieve (C)		**10.33**
	Moisture Content (MC)	**42.6%**	**% Passing #200 Sieve (A)**		**95.2%**

Boring No.		Sample No.		Sample Depth:	
Sample Description					
☐ *Auxiliary*		*#200 Wash*	Method A ☐	Method B ☐	
	Tare #:		Soaked ☐	*Soak Time*	24 hrs.
	Tare Wt. (T)		Original Dry Mass of Sample (B)		
	Wet Wt (W) + T		After 200 Wash + Tare Wt. (C_T)		
	Dry Wt (D) + T		Dry Mass Retained on #200 Sieve (C)		
	Moisture Content (MC)		**% Passing #200 Sieve (A)**		

Balance ID.	*06976*	*Calibration Date:*	*1-7-20*	*#200 Sieve*	*10712*	*Calibration Date:*	*12-7-20*

Notes / Deviations / References: ASTM D1140: Amount of Material in Soil Finer Than the No. 200 (75-um)) Sieve

ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

% Passing #200 = A = [(B-C)/B] * 100

Kim Gonzalez		Nicet II	1/4/2021
Technician Name	*Signature*	*Certification Type/No.*	*Date*
Talon Wagenknecht		Group Leader	1/4/2021
Technical Responsibility	*Signature*	*Position*	*Date*

Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☐ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Charleston: 620 Wando Park Boulevard, Mt. Pleasant, SC 29464

Project #:	1413-20-100	Report Date:	1-4-21
Project Name:	Town Summerville Pond Exploration Tov	Test Date(s)	1-3-21
Client Name:	Town of Summerville		
Client Address:	200 South Main Street: Summerville, SC 29483		

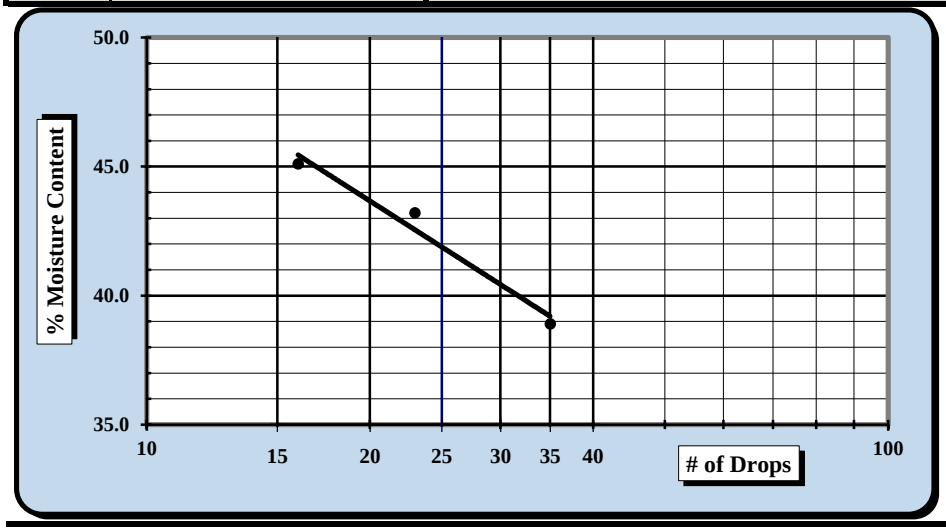
Sample ID. B-1 Type: #3 Sample Date: 12-17-2020

Location: Summerville SC Depth 4.0 FT

Sample Description: YELLOWISH BROWN CLAYEY SAND

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	6976	1/7/2020	Grooving tool	10659	7/31/2020
LL Apparatus	1/28/1917	7/31/2020	Grooving tool		
Oven	13796	8/3/2020	Grooving tool		

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	1	2	3	4	5	6	7	8	9
A	Tare Weight	20.70	21.08	21.25				22.61	22.44	
B	Wet Soil Weight + A	45.09	46.69	40.16				27.19	28.04	
C	Dry Soil Weight + A	38.26	38.96	34.28				26.36	27.03	
D	Water Weight (B-C)	6.83	7.73	5.88				0.83	1.01	
E	Dry Soil Weight (C-A)	17.56	17.88	13.03				3.75	4.59	
F	% Moisture (D/E)*100	38.9%	43.2%	45.1%				22.1%	22.0%	
N	# OF DROPS	35	23	16						
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	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**42**
Plastic Limit	**22**
Plastic Index	**20**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☑ Dry Preparation ☐ Air Dried ☐ *Estimate the % Retained on the #40 Sieve:* 10%

Notes / Deviations / References:

Kim Gonzalez	1/4/2021	Talon Wagenknecht	1/4/2021
Technician Name	*Date*	*Technical Responsibility*	*Date*

Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☐ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Charleston: 620 Wando Park Boulevard, Mt. Pleasant, SC 29464

Project #:	1413-20-100	Report Date:	1-4-21
Project Name:	Town Summerville Pond Exploration Tov	Test Date(s)	1-3-21
Client Name:	Town of Summerville		
Client Address:	200 South Main Street: Summerville, SC 29483		

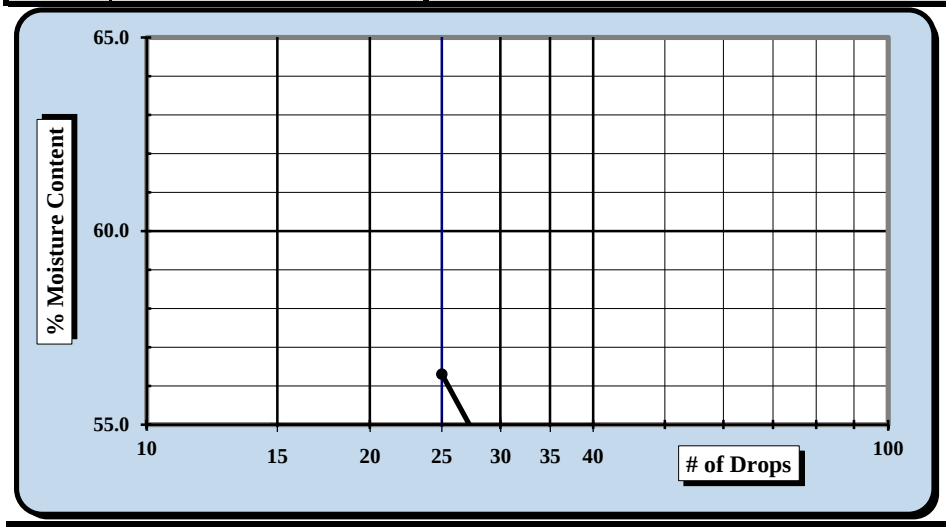
Sample ID. B-1 Type: #4 Sample Date: 12-17-2020

Location: Summerville SC Depth 6.0 FT

Sample Description: GRAYISH YELLOW SANDY CLAY

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	6976	1/7/2020	Grooving tool	10659	7/31/2020
LL Apparatus	1/28/1917	7/31/2020	Grooving tool		
Oven	13796	8/3/2020	Grooving tool		

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	1	2	3	4	5	6	7	8	9
A	Tare Weight	21.90						21.87	21.09	
B	Wet Soil Weight + A	47.15						25.70	26.43	
C	Dry Soil Weight + A	38.06						24.90	25.33	
D	Water Weight (B-C)	9.09						0.80	1.10	
E	Dry Soil Weight (C-A)	16.16						3.03	4.24	
F	% Moisture (D/E)*100	56.3%						26.4%	25.9%	
N	# OF DROPS	25								
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	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**56**
Plastic Limit	**26**
Plastic Index	**30**
Group Symbol	**CH**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☑ Dry Preparation ☐ Air Dried ☐ *Estimate the % Retained on the #40 Sieve:* 10%

Notes / Deviations / References:

Kim Gonzalez	1/4/2021	Talon Wagenknecht	1/4/2021
Technician Name	*Date*	*Technical Responsibility*	*Date*

Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☐ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Charleston: 620 Wando Park Boulevard, Mt. Pleasant, SC 29464

Project #:	1413-20-100	Report Date:	1-4-21
Project Name:	Town Summerville Pond Exploration Tov	Test Date(s)	1-3-21
Client Name:	Town of Summerville		
Client Address:	200 South Main Street: Summerville, SC 29483		

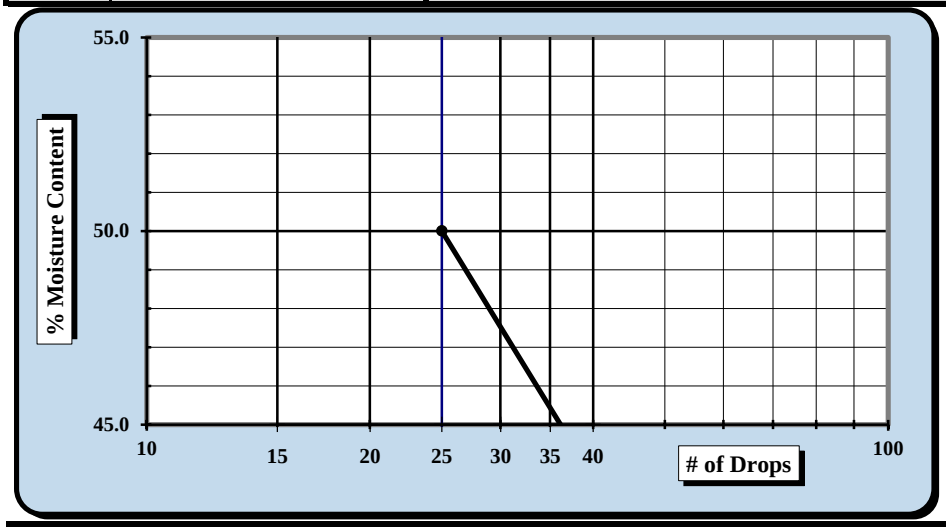
Sample ID. B-1 Type: #6 Sample Date: 12-17-2020

Location: Summerville SC Depth 10.0 FT

Sample Description: GRAYISH YELLOW SANDY SILT

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	6976	1/7/2020	Grooving tool	10659	7/31/2020
LL Apparatus	1/28/1917	7/31/2020	Grooving tool		
Oven	13796	8/3/2020	Grooving tool		

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	1	2	3	4	5	6	7	8	9
A	Tare Weight	22.39						22.80	21.27	
B	Wet Soil Weight + A	51.46						26.94	27.09	
C	Dry Soil Weight + A	41.77						25.87	25.52	
D	Water Weight (B-C)	9.69						1.07	1.57	
E	Dry Soil Weight (C-A)	19.38						3.07	4.25	
F	% Moisture (D/E)*100	50.0%						34.9%	36.9%	
N	# OF DROPS	25								
LL	LL = **F** * FACTOR									
Ave.	*Average*							**35.9%**		



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	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**50**
Plastic Limit	**36**
Plastic Index	**14**
Group Symbol	**MH**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☑ Dry Preparation ☐ Air Dried ☐ *Estimate the % Retained on the #40 Sieve:* 10%

Notes / Deviations / References:

Kim Gonzalez	1/4/2021	Talon Wagenknecht	1/4/2021
Technician Name	*Date*	*Technical Responsibility*	*Date*

Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☐ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Charleston: 620 Wando Park Boulevard, Mt. Pleasant, SC 29464

Project #:	1413-20-100	Report Date:	1-4-21
Project Name:	Town Summerville Pond Exploration Tov	Test Date(s)	1-3-21
Client Name:	Town of Summerville		
Client Address:	200 South Main Street: Summerville, SC 29483		

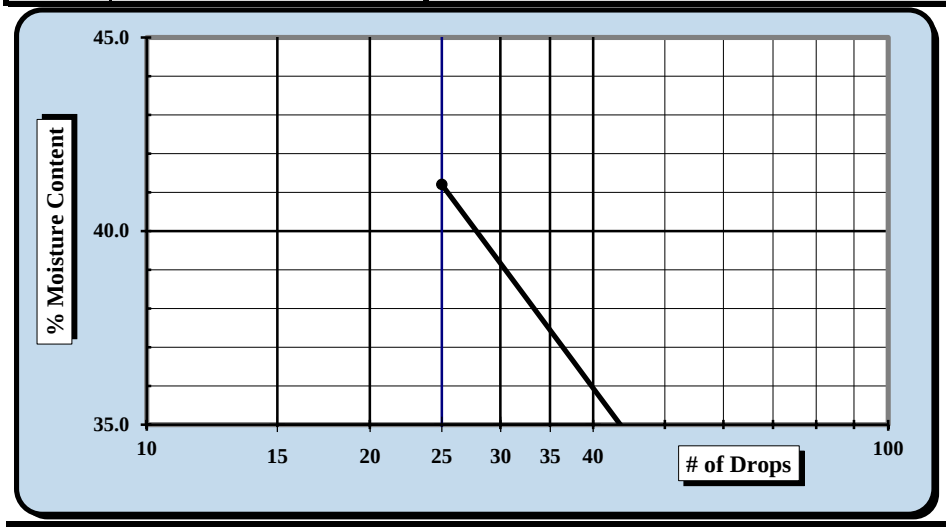
Sample ID. B-1 Type: #10 Sample Date: 12-17-2020

Location: Summerville SC Depth 18.0 FT

Sample Description: GREENISH GRAY SILT

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	6976	1/7/2020	Grooving tool	10659	7/31/2020
LL Apparatus	1/28/1917	7/31/2020	Grooving tool		
Oven	13796	8/3/2020	Grooving tool		

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	1	2	3	4	5	6	7	8	9
A	Tare Weight	22.77						12.64	12.91	
B	Wet Soil Weight + A	51.42						17.51	16.76	
C	Dry Soil Weight + A	43.06						16.46	16.00	
D	Water Weight (B-C)	8.36						1.05	0.76	
E	Dry Soil Weight (C-A)	20.29						3.82	3.09	
F	% Moisture (D/E)*100	41.2%						27.5%	24.6%	
N	# OF DROPS	25								
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	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit **41**

Plastic Limit **26**

Plastic Index **15**

Group Symbol **CH**

Multipoint Method ☑

One-point Method ☐

Wet Preparation ☑ Dry Preparation ☐ Air Dried ☐ *Estimate the % Retained on the #40 Sieve:* 10%

Notes / Deviations / References:

Kim Gonzalez	1/4/2021	Talon Wagenknecht	1/4/2021
Technician Name	*Date*	*Technical Responsibility*	*Date*

Field Testing Procedures

Soil Test Borings

All boring and sampling operations were conducted in accordance with ASTM Designation D-1586. Initially, the borings were advanced by either mechanically augering or wash boring through the soils. Where necessary, a heavy drilling fluid is used below the water table to stabilize the side and bottom of the drill hole. At regular intervals soil samples were obtained with a standard 1.4-inch I.D., 2-inch O.D., split-barrel sampler. The sampler was first seated 6 inches to penetrate any loose cuttings and then driven an additional foot with blows of a 140 pound hammer falling 30 inches. The number of hammer blows required to drive the sampler the final foot is designated the "Standard Penetration Resistance." The penetration resistance, when properly evaluated, is an index to the soil strength.

LABORATORY TESTING PROCEDURES

Atterberg Limits Test (ASTM D-4318)

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

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

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

Natural Moisture Content Test (ASTM D 2216)

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