

designed to resist at-rest earth pressures. Such structures should be properly designed by the Owner's engineer. The following soil parameters apply to the encountered subsurface strata and may be used for design of the proposed temporary and permanent retaining structures.

<b>LATERAL EARTH PRESSURE PARAMETERS</b>			
<b>Parameter</b>	<b>On-Site Granular Soils</b>	<b>On-Site Fine-Grained Soils</b>	<b>Imported Granular Backfill</b>
Moist Density ( $\gamma_{\text{moist}}$ )	140 pcf	135 pcf	130 pcf
Internal Friction Angle ( $\phi$ )	30°	28°	30°
Active Earth Pressure Coefficient ( $K_a$ )	0.33	0.39	0.33
Passive Earth Pressure Coefficient ( $K_p$ )	3.00	2.56	3.00
At-Rest Earth Pressure Coefficient ( $K_o$ )	0.50	0.56	0.50

Lateral earth pressure will depend on the backfill slope angle and the wall batter angle. A sloped backfill will add surcharge load and affect the angle of the resultant force. The effect of other surcharges will also need to be included in earth pressure calculations, including the loads imposed by adjacent structures and traffic. The effects of proposed sloped backfill surface grades, and proposed slopes beyond the toe of the retaining structure, if applicable, must be considered when calculating resultant forces to be resisted by the retaining structure. A coefficient of friction of 0.35 against sliding can be used for concrete on the existing site soils. Retaining wall footings should be designed so that the combined effect of vertical and horizontal resultants and overturning moment does not exceed the maximum soil bearing capacity provided in Section 5.4.

**Backfill Criteria:** Whitestone recommends that granular soils be used to backfill behind the proposed retaining walls. The granular backfill materials should consist of clean, relatively well graded sand or gravel with a maximum particle size of three inches and five percent to 15 percent of material finer than a #200 sieve. The material should be free of clay lumps, organics, and deleterious material. Portions of the on-site soils may be suitable for retaining wall backfill, pending approval from the wall designer. Imported granular soils also may be required. A maximum density of 140 pcf should not be exceeded to avoid creating excessive lateral pressure on the walls during compaction operations.

Whitestone recommends that backfill directly behind any walls be compacted with light, hand-held compactors. Heavy compactors and grading equipment should not be allowed to operate within a zone of influence measured at a 45-degree angle from the base of the walls during backfilling to avoid developing excessive temporary or long-term lateral soil pressures.

## **6.0 SUPPLEMENTAL POST INVESTIGATION SERVICES**

**Construction Inspection and Monitoring:** The owner's geotechnical engineer should conduct inspection, testing, and consultation during construction as described in previous sections of this report. Monitoring and testing should also be conducted to verify that the existing surface cover materials are properly removed, and suitable materials, used for controlled fill, are properly placed and compacted over suitable subgrade soils. Any overexcavation of existing fill (although not anticipated) within the proposed building footprint area should be witnessed and documented by the owner's geotechnical engineer. The placement of structural backfill within the building structures and behind retaining walls as well as the placement and overexcavation of unsuitable soils also should be documented by the owner's geotechnical engineer.

## **7.0 CLOSING**

Whitestone appreciates the opportunity to be of service to 522 Valley Estates, LLC. Please contact us with any questions or comments regarding this report.

Sincerely,

**WHITESTONE ASSOCIATES, INC.**



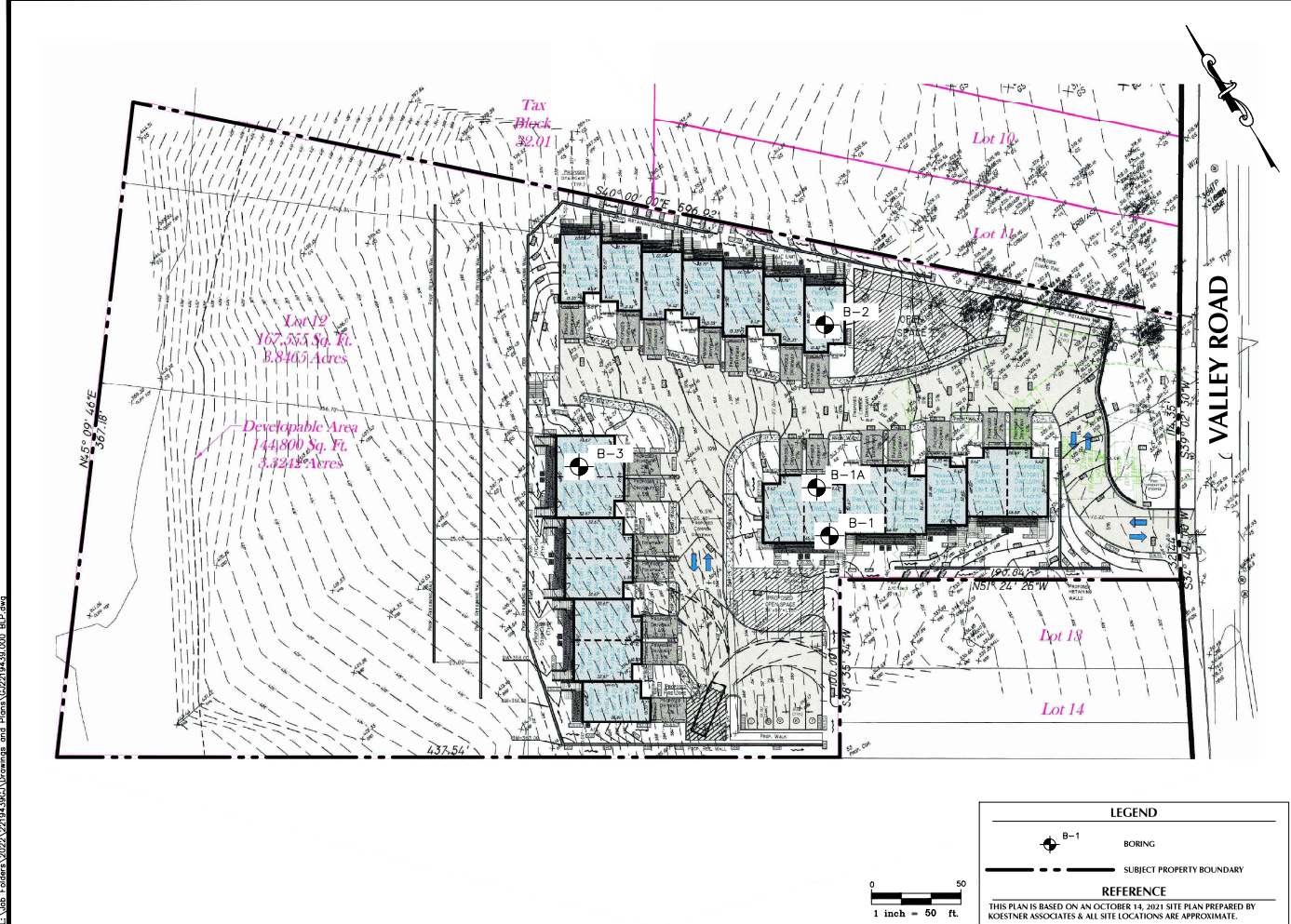
Kyle J. Kopacz, P.E.  
Associate



Laurence W. Keller, P.E.  
Vice-President

KK/TJ/ri L:\Job Folders\2022\2219439GJ\Reports and Submittals\19439 LimGL.docx  
Enclosure  
Copy: Tristan D. Jovanov, Whitestone Associates, Inc.

**FIGURE 1**  
**Boring Location Plan**



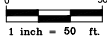
VALLEY ROAD

**LEGEND**

B-1 BORING  
 SUBJECT PROPERTY BOUNDARY

**REFERENCE**

THIS PLAN IS BASED ON AN OCTOBER 14, 2021 SITE PLAN PREPARED BY KOESTNER ASSOCIATES & ALL SITE LOCATIONS ARE APPROXIMATE.




**WHITESTONE**  
 An Employee-Owned Company

30 INDEPENDENCE BOULEVARD, SUITE 250, WARREN, NJ 07059  
 908.668.7777 WHITESTONEASSOC.COM

<b>DRAWING TITLE:</b>	
<b>BORING LOCATION PLAN</b>	
<b>CLIENT:</b>	
522 VALLEY ESTATES, LLC	
<b>PROJECT:</b>	
PROPOSED RESIDENTIAL REDEVELOPMENT 522 VALLEY ESTATES, LLC CLIFTON, PASSAIC COUNTY, NJ	

<b>PROJECT #:</b>	
GJ2219439.000	
<b>DESIGNED BY:</b>	<b>PLT. NO.:</b>
GR	KK
<b>DATE:</b>	<b>ISSUE:</b>
8/17/22	1
<b>SCALE:</b>	
1" = 50'	

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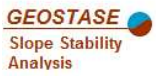
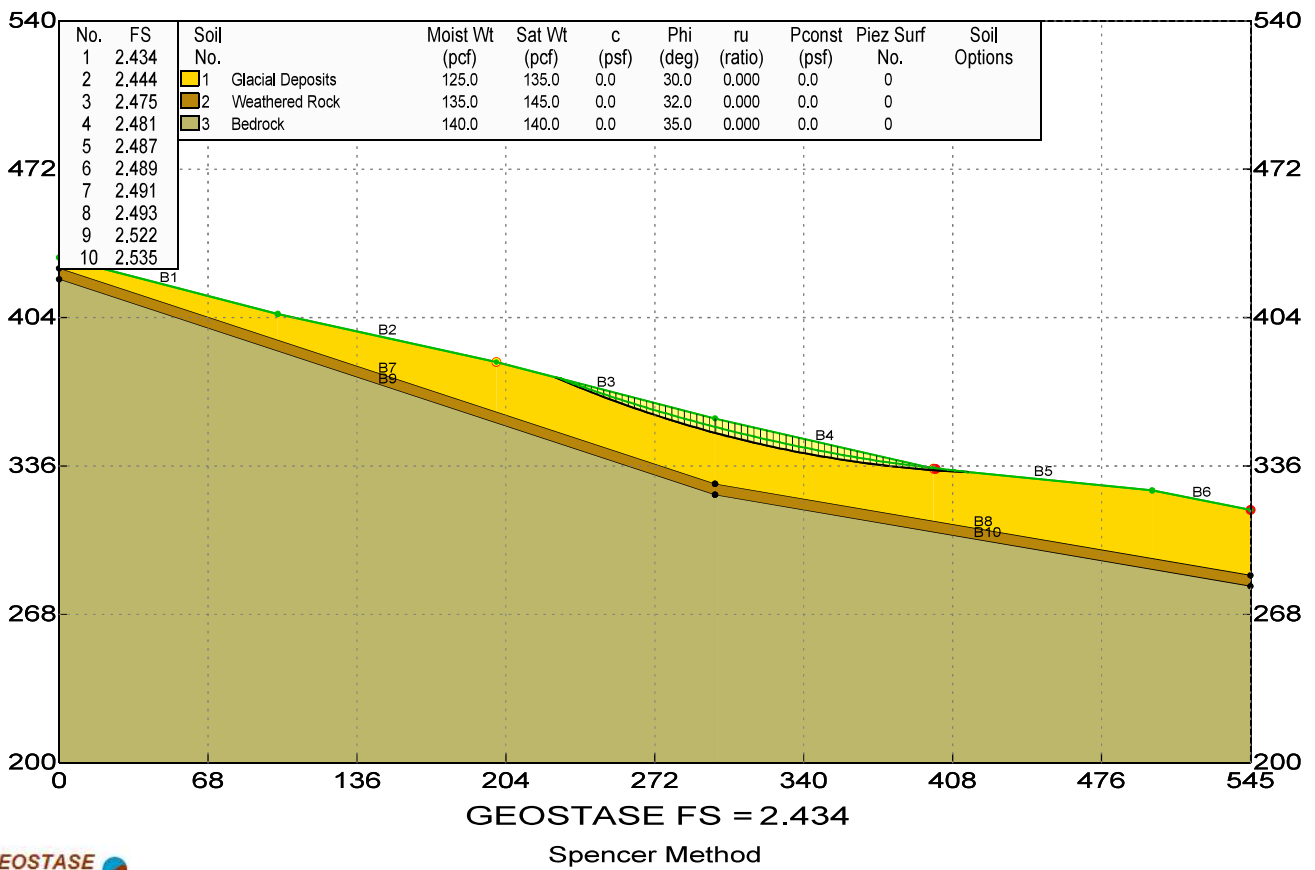


**FIGURE 2**  
**Slope Stability Analyses**

# Proposed Residential Development GJ2219439.000

Whitestone Associates, Inc.

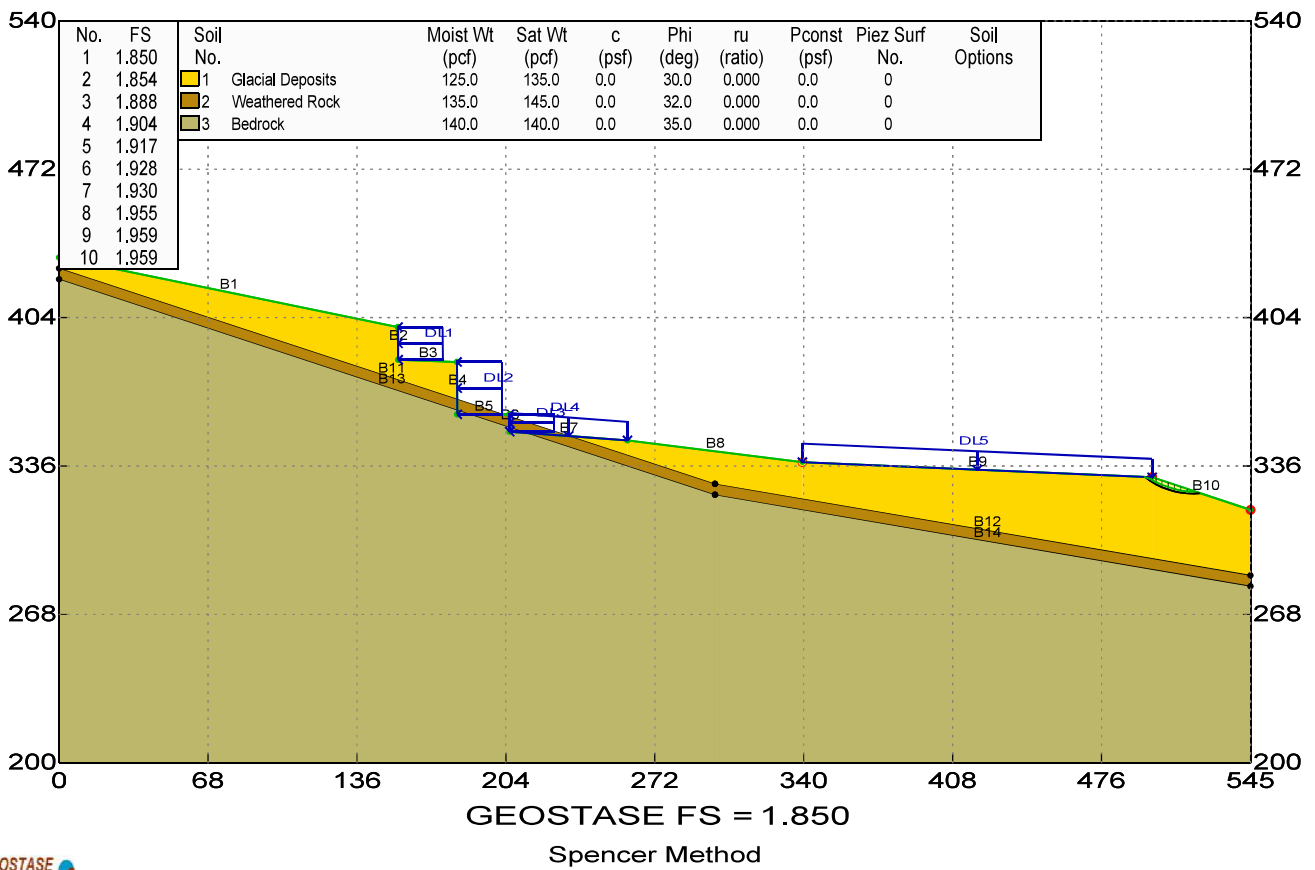
\\Existing Conditions.gsd



# Proposed Residential Development GJ2219439.000

Whitestone Associates, Inc.

\\Proposed Conditions.gsd



GEOSTASE® by GREGORY GEOTECHNICAL SOFTWARE

PLATE C.1

**APPENDIX A**  
**Records of Subsurface Exploration**



# RECORD OF SUBSURFACE EXPLORATION

<b>Project:</b> Proposed Residential Development		<b>WAI Project No.:</b> GJ2219439.000	
<b>Location:</b> 522 Valley Road, Clifton, Passaic County, New Jersey		<b>Client:</b> 522 Valley Estates, LLC	
<b>Surface Elevation:</b> ± 330.0 feet	<b>Date Started:</b> 8/15/2022	<b>Water Depth   Elevation</b> (feet bgs)   (feet)	<b>Cave-In Depth   Elevation</b> (feet bgs)   (feet)
<b>Termination Depth:</b> 35.0 feet bgs	<b>Date Completed:</b> 8/16/2022	<b>During:</b> NE   330.0 ▼	<b>At Completion:</b> 30.0   300.0 ☒
<b>Proposed Location:</b> Building Pad	<b>Logged By:</b> RL	<b>At Completion:</b> NE   330.0 ▼	<b>24 Hours:</b> ---   --- ▼
<b>Drill / Test Method:</b> SPT	<b>Contractor:</b> ETD	<b>24 Hours:</b> ---   --- ▼	<b>24 Hours:</b> ---   --- ▼
Mud Rotary	<b>Equipment:</b> CME 75		

SAMPLE INFORMATION						DEPTH (feet)	STRATA	DESCRIPTION OF MATERIALS (Classification)	REMARKS
Depth (feet)	No	Type	Blows Per 6"	Rec. (in.)	N				
						0.0	TOPSOIL	2" Topsoil	
0 - 2	S-1	X	6 - 6 - 7 - 9	6	13	0.0 - 2.0	GLACIAL DEPOSITS	Brown Silty Sand with Gravel, Moist, Medium Dense (SM)	
2 - 4	S-2	X	14 - 15 - 11 - 9	4	26	2.0 - 4.0		As Above (SM)	
5 - 7	S-3	X	9 - 12 - 16 - 16	24	28	4.0 - 5.0		Reddish-Brown Sandy Silt with Gravel, Moist, Very Stiff (ML)	
7 - 8.3	S-4	X	28 - 31 - 50/4"	24	81/10"	5.0 - 8.3		As Above (ML)	2.5 tsf
10 - 12	S-5	X	32 - 38 - 42 - 0	24	80	8.3 - 10.0		Reddish-Brown Silty Sand with Gravel, Moist, Very Dense (SM)	
15 - 17	S-6	X	22 - 36 - 48 - 53	24	84	10.0 - 15.0		As Above (SM)	
20 - 22	S-7	X	43 - 26 - 36 - 30	20	62	15.0 - 20.0		Reddish-Brown Sandy Silt, Moist, Very Stiff (ML)	3.5 tsf
						20.0 - 22.0		Reddish-Brown Silty Sand, Moist, Very Dense (SM)	
						22.0 - 25.0			

# RECORD OF SUBSURFACE EXPLORATION

<b>Project:</b> Proposed Residential Development		<b>WAI Project No.:</b> GJ2219439.000	
<b>Location:</b> 522 Valley Road, Clifton, Passaic County, New Jersey		<b>Client:</b> 522 Valley Estates, LLC	
<b>Surface Elevation:</b> ± 330.0 feet	<b>Date Started:</b> 8/15/2022	<b>Water Depth   Elevation</b> (feet bgs)   (feet)	<b>Cave-In Depth   Elevation</b> (feet bgs)   (feet)
<b>Termination Depth:</b> 35.0 feet bgs	<b>Date Completed:</b> 8/16/2022	<b>During:</b> NE   330.0 ▼	<b>At Completion:</b> ---   --- <input type="checkbox"/>
<b>Proposed Location:</b> Building Pad	<b>Logged By:</b> RL	<b>At Completion:</b> NE   330.0 ▼	<b>24 Hours:</b> ---   --- <input type="checkbox"/>
<b>Drill / Test Method:</b> HSA / SPT	<b>Contractor:</b> ETD	<b>24 Hours:</b> ---   --- ▼	<b>24 Hours:</b> ---   --- <input type="checkbox"/>
<b>Drill / Test Method:</b> Mud Rotary	<b>Equipment:</b> CME 75		

SAMPLE INFORMATION						DEPTH (feet)	STRATA	DESCRIPTION OF MATERIALS (Classification)	REMARKS
Depth (feet)	No	Type	Blows Per 6"	Rec. (in.)	N				
25 - 26.2	S-8	<input checked="" type="checkbox"/>	44 - 50 - 50/2	21	100/8	25.0	GLACIAL DEPOSITS	As Above (SM)	
30 - 30.25	S-9	<input checked="" type="checkbox"/>	50/3	3	50/3	30.0	WEATHERED ROCK	Reddish-Brown Weathered Rock with Silt, Wet, Very Dense (WR)	
35 - 35	S-10	<input checked="" type="checkbox"/>	50/0	NR	30/0	35.0		No Recovery Presumed As Above	
						40.0		Boring Log B-1 Terminated at a Depth of 35.0 Feet Below Ground Surface	
						45.0			
						50.0			



# RECORD OF SUBSURFACE EXPLORATION

Boring No.: **B-1A**

Page 1 of 3

<b>Project:</b> Proposed Residential Development		<b>WAI Project No.:</b> GJ2219439.000	
<b>Location:</b> 522 Valley Road, Clifton, Passaic County, New Jersey		<b>Client:</b> 522 Valley Estates, LLC	
<b>Surface Elevation:</b> ± 330.0 feet	<b>Date Started:</b> 8/16/2022	<b>Water Depth   Elevation</b> (feet bgs)   (feet)	<b>Cave-In Depth   Elevation</b> (feet bgs)   (feet)
<b>Termination Depth:</b> 33.1 feet bgs	<b>Date Completed:</b> 8/16/2022	<b>During:</b> NE   330.0 ▼	<b>At Completion:</b> 30.0   300.0 <input type="checkbox"/>
<b>Proposed Location:</b> Building Pad	<b>Logged By:</b> RL	<b>At Completion:</b> NE   330.0 ▼	<b>24 Hours:</b> ---   --- <input type="checkbox"/>
<b>Drill / Test Method:</b> HSA / SPT Mud Rotary	<b>Contractor:</b> ETD	<b>24 Hours:</b> ---   --- ▼	<b>24 Hours:</b> ---   --- <input type="checkbox"/>
	<b>Equipment:</b> CME 75		

SAMPLE INFORMATION						DEPTH (feet)	STRATA	DESCRIPTION OF MATERIALS (Classification)	REMARKS
Depth (feet)	No	Type	Blows Per 6"	Rec. (in.)	N				
						25.0			
						30.0			
						35.0			
33 - 33.1	S-1	<input checked="" type="checkbox"/>	50/1	1	50/1		WR	Reddish-Brown Weathered Rock (WR)	Offset 20 Feet from B-1
									Boring Log B-1A Terminated at a Depth of 00.0 Feet Below Ground Surface

NOTES: bgs = below ground surface, NA = Not Applicable, NE = Not Encountered, NS = Not Surveyed, P = Perched

# RECORD OF SUBSURFACE EXPLORATION

<b>Project:</b> Proposed Residential Development		<b>WAI Project No.:</b> GJ2219439.000	
<b>Location:</b> 522 Valley Road, Clifton, Passaic County, New Jersey		<b>Client:</b> 522 Valley Estates, LLC	
<b>Surface Elevation:</b> ± 342.0 feet	<b>Date Started:</b> 8/15/2022	<b>Water Depth   Elevation</b> (feet bgs)   (feet)	<b>Cave-In Depth   Elevation</b> (feet bgs)   (feet)
<b>Termination Depth:</b> 10.0 feet bgs	<b>Date Completed:</b> 8/16/2022	<b>During:</b> NE   --- ▼	<b>At Completion:</b> 10.0   332.0 ☒
<b>Proposed Location:</b> Building Pad	<b>Logged By:</b> RL	<b>At Completion:</b> NE   --- ▼	<b>24 Hours:</b> ---   --- ▼
<b>Drill / Test Method:</b> SPT	<b>Contractor:</b> ETD	<b>24 Hours:</b> ---   --- ▼	<b>24 Hours:</b> ---   --- ▼
Mud Rotary	<b>Equipment:</b> CME 75		

SAMPLE INFORMATION						DEPTH (feet)	STRATA	DESCRIPTION OF MATERIALS (Classification)	REMARKS
Depth (feet)	No	Type	Blows Per 6"	Rec. (in.)	N				
						0.0	TOPSOIL	2" Topsoil	
0 - 2	S-1	X	2 - 7 - 24 - 24	2	32	2.0	GLACIAL DEPOSITS	Brown Silty Sand, Dry, Dense (SM)	
2 - 4	S-2	X	6 - 14 - 18 - 21	2	32	4.0		Reddish-Brown Poorly Graded Gravel with Silt and Sand, Dry, Dense (SP-SM)	
4 - 6	S-3	X	12 - 26 - 32 - 48	4	58	5.0		Reddish-Brown Sandy Silt, Dry, Very Stiff (ML)	
6 - 8	S-4	X	32 - 48 - 61 - 69	8	109	7.0		Reddish-Brown Silty Gravel, Dry, Very Dense (SM)	
8 - 10	S-5	X	33 - 42 - 31 - 29	10	73	8.3		As Above, Moist (SM)	
						10.0		Boring Log B-2 Terminated at a Depth of 10.0 Feet Below Ground Surface	
						12.0			
						15.0			
						17.0			
						20.0			
						22.0			
						25.0			

# RECORD OF SUBSURFACE EXPLORATION

<b>Project:</b> Proposed Residential Development		<b>WAI Project No.:</b> GJ2219439.000	
<b>Location:</b> 522 Valley Road, Clifton, Passaic County, New Jersey		<b>Client:</b> 522 Valley Estates, LLC	
<b>Surface Elevation:</b> ± 382.0 feet	<b>Date Started:</b> 8/15/2022	<b>Water Depth   Elevation</b> (feet bgs)   (feet)	<b>Cave-In Depth   Elevation</b> (feet bgs)   (feet)
<b>Termination Depth:</b> 4.75 feet bgs	<b>Date Completed:</b> 8/16/2022	<b>During:</b> NE   --- ▼	<b>At Completion:</b> NE   --- ▼
<b>Proposed Location:</b> Building Pad	<b>Logged By:</b> RL	<b>24 Hours:</b> ---   --- ▼	<b>At Completion:</b> 4.0   378.0 <input checked="" type="checkbox"/>
<b>Drill / Test Method:</b> SPT	<b>Contractor:</b> ETD		<b>24 Hours:</b> ---   --- <input checked="" type="checkbox"/>
Tripod	<b>Equipment:</b> CME 75		

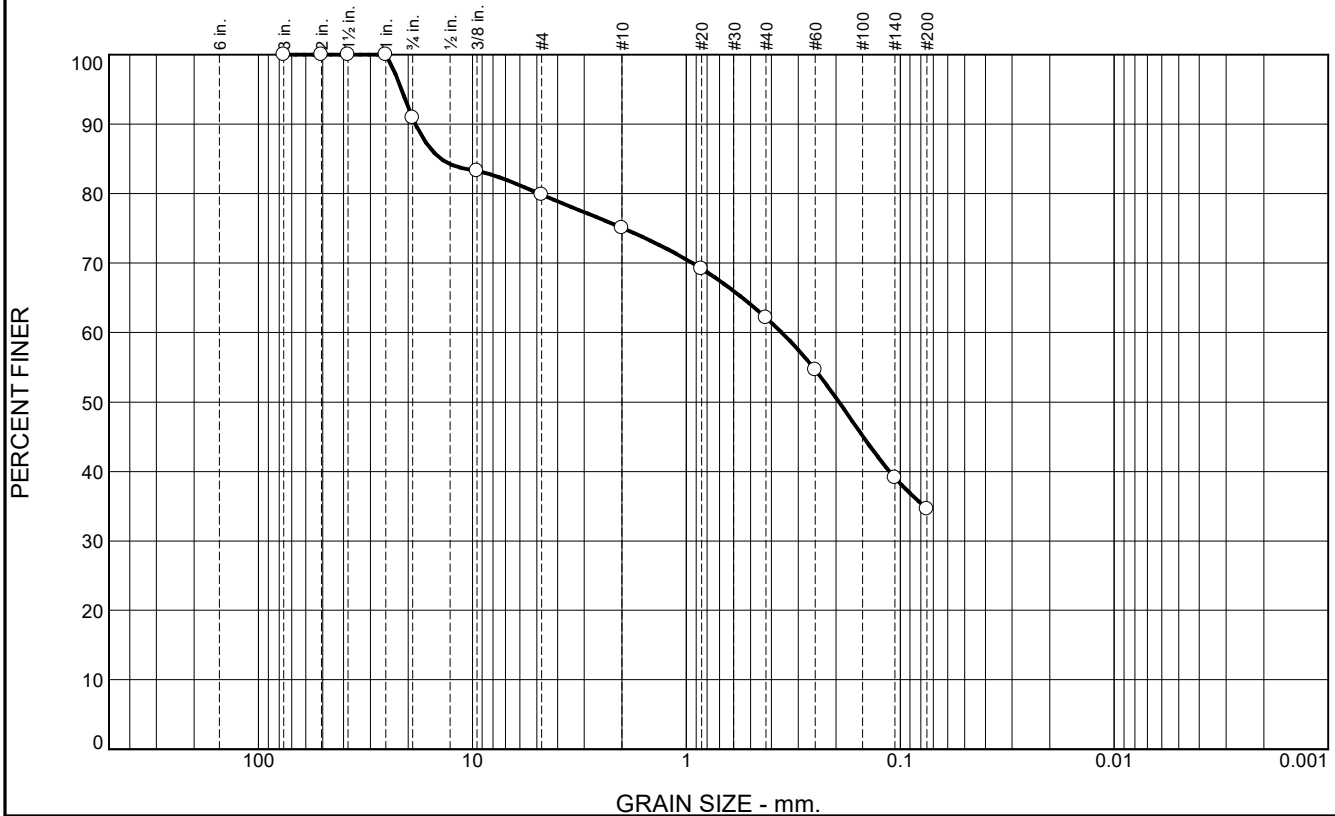
SAMPLE INFORMATION						DEPTH (feet)	STRATA	DESCRIPTION OF MATERIALS (Classification)	REMARKS
Depth (feet)	No	Type	Blows Per 6"	Rec. (in.)	N				
						0.0	TOPSOIL	3" Topsoil	
0 - 2	S-1		5 - 7 - 29 - 35	3	32	2.0	GLACIAL DEPOSITS	Brown Silty Sand with Gravel, Dry, Dense (SM)	
2 - 3.75	S-2		30 - 41 - 62 - 100 / 3	6	103	3.75		Reddish-Brown Poorly Graded Gravel with Silt and Sand, Dry (SP-SM)	
3.75 - 4.75	S-3		52 - 100	1	100/6	4.75		As Above (SP-SM)	
						12.0			
						15.0			
						17.0			
						20.0			
						22.0			
						25.0			
Boring Log B-3 Terminated at a Depth of 4.75 Feet Below Ground Surface Due to Spoon Refusal									



# **APPENDIX B**

## **Laboratory Test Results**

# Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	9.1	11.1	4.7	13.0	27.5	34.6	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3	100.0		
2	100.0		
1.5	100.0		
1	100.0		
.75	90.9		
.375	83.3		
#4	79.8		
#10	75.1		
#20	69.2		
#40	62.1		
#60	54.6		
#140	39.1		
#200	34.6		

**Material Description**

Silty Sand with Gravel

**Atterberg Limits**  
 PL= 18      LL= 21      PI= 3

**Coefficients**  
 D<sub>90</sub>= 18.4623      D<sub>85</sub>= 14.0052      D<sub>60</sub>= 0.3587  
 D<sub>50</sub>= 0.1938      D<sub>30</sub>=                      D<sub>15</sub>=  
 D<sub>10</sub>=                      C<sub>u</sub>=                      C<sub>c</sub>=

**Classification**  
 USCS= SM      AASHTO= A-2-4(0)

**Remarks**  
 W<sub>n</sub> = 14.0 %

\* (no specification provided)

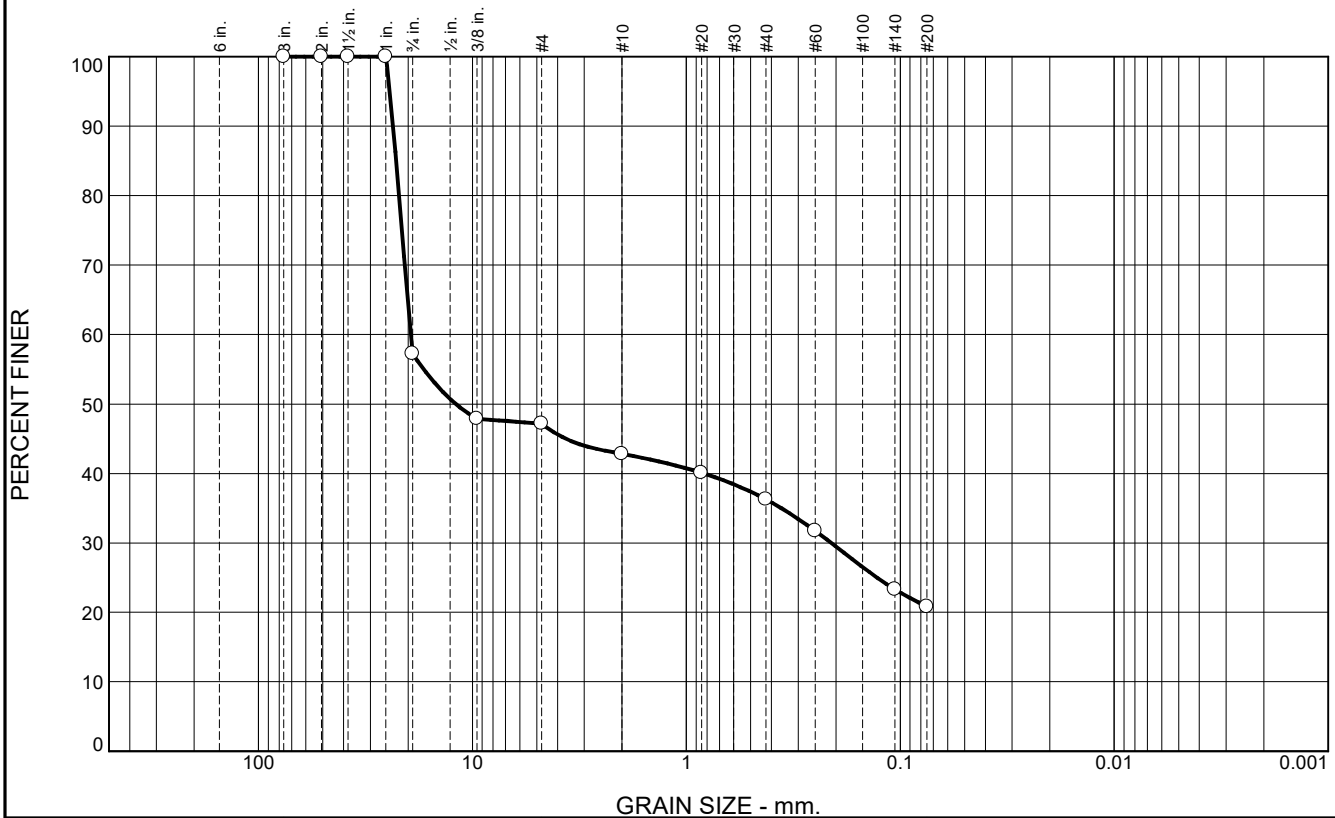
Source of Sample: B-1      Depth: 5.0' - 7.0'  
 Sample Number: S-3

Date: 08/22/2022

**WHITESTONE ASSOCIATES, INC.**  
 Warren, New Jersey

Client: 522 Valley Estates, LLC  
 Project: Proposed Residential Redevelopment  
 522 Valley Road, Clifton, Passaic County, New Jersey  
 Project No: GJ2219439.000      Figure

# Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	42.8	10.0	4.4	6.5	15.5	20.8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3	100.0		
2	100.0		
1.5	100.0		
1	100.0		
.75	57.2		
.375	47.9		
#4	47.2		
#10	42.8		
#20	40.1		
#40	36.3		
#60	31.7		
#140	23.3		
#200	20.8		

**Material Description**

Silty Gravel with Sand

**Atterberg Limits**

PL= NP      LL= NP      PI= NP

**Coefficients**

D<sub>90</sub>= 23.4385      D<sub>85</sub>= 22.6889      D<sub>60</sub>= 19.4336  
D<sub>50</sub>= 11.9606      D<sub>30</sub>= 0.2103      D<sub>15</sub>=  
D<sub>10</sub>=                      C<sub>u</sub>=                      C<sub>c</sub>=

**Classification**

USCS= GM                      AASHTO= A-1-b

**Remarks**

W<sub>n</sub> = 4.4 %

\* (no specification provided)

Source of Sample: B-3      Depth: 2.0' - 4.75'  
Sample Number: S-2/S-3

Date: 08/22/2022

**WHITESTONE  
ASSOCIATES, INC.  
Warren, New Jersey**

**Client:** 522 Valley Estates, LLC  
**Project:** Proposed Residential Redevelopment  
522 Valley Road, Clifton, Passaic County, New Jersey  
**Project No:** GJ2219439.000      **Figure**



**APPENDIX C**  
**Supplemental Information**  
**(USCS, Terms & Symbols)**

## UNIFIED SOIL CLASSIFICATION SYSTEM

### SOIL CLASSIFICATION CHART

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

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS FOR SAMPLES WITH 5% TO 12% FINES

#### GRADATION\*

% FINER BY WEIGHT

TRACE..... 1% TO 10%  
LITTLE..... 10% TO 20%  
SOME..... 20% TO 35%  
AND..... 35% TO 50%

#### COMPACTNESS\*

Sand and/or Gravel

RELATIVE DENSITY

LOOSE..... 0% TO 40%  
MEDIUM DENSE.... 40% TO 70%  
DENSE..... 70% TO 90%  
VERY DENSE..... 90% TO 100%

#### CONSISTENCY\*

Clay and/or Silt

RANGE OF SHEARING STRENGTH IN POUNDS PER SQUARE FOOT

VERY SOFT..... LESS THAN 250  
SOFT..... 250 TO 500  
MEDIUM..... 500 TO 1000  
STIFF..... 1000 TO 2000  
VERY STIFF..... 2000 TO 4000  
HARD..... GREATER THAN 4000

\* VALUES ARE FROM LABORATORY OR FIELD TEST DATA, WHERE APPLICABLE. WHEN NO TESTING WAS PERFORMED, VALUES ARE ESTIMATED.

L:\Geotechnical Forms and References\Reports\USCSTRMSSYM NJ.docx

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BEDFORD, NH  
603.514.2230

TAMPA, FL  
813.851.0690

*Environmental & Geotechnical Engineers & Consultants*

## GEOTECHNICAL TERMS AND SYMBOLS

### SAMPLE IDENTIFICATION

The Unified Soil Classification System is used to identify the soil unless otherwise noted.

### SOIL PROPERTY SYMBOLS

- N: Standard Penetration Value: Blows per ft. of a 140 lb. hammer falling 30" on a 2" O.D. split-spoon.  
 Qu: Unconfined compressive strength, TSF.  
 Qp: Penetrometer value, unconfined compressive strength, TSF.  
 Mc: Moisture content, %.  
 LL: Liquid limit, %.  
 PI: Plasticity index, %.  
 δd: Natural dry density, PCF.  
 ▽: Apparent groundwater level at time noted after completion of boring.

### DRILLING AND SAMPLING SYMBOLS

- NE: Not Encountered (Groundwater was not encountered).  
 SS: Split-Spoon - 1 3/8" I.D., 2" O.D., except where noted.  
 ST: Shelby Tube - 3" O.D., except where noted.  
 AU: Auger Sample.  
 OB: Diamond Bit.  
 CB: Carbide Bit  
 WS: Washed Sample.

### RELATIVE DENSITY AND CONSISTENCY CLASSIFICATION

<u>Term (Non-Cohesive Soils)</u>	<u>Standard Penetration Resistance</u>
Very Loose	0-4
Loose	4-10
Medium Dense	10-30
Dense	30-50
Very Dense	Over 50

<u>Term (Cohesive Soils)</u>	<u>Qu (TSF)</u>
Very Soft	0 - 0.25
Soft	0.25 - 0.50
Firm (Medium)	0.50 - 1.00
Stiff	1.00 - 2.00
Very Stiff	2.00 - 4.00
Hard	4.00+

### PARTICLE SIZE

Boulders	8 in.+	Coarse Sand	5mm-0.6mm	Silt	0.074mm-0.005mm
Cobbles	8 in.-3 in.	Medium Sand	0.6mm-0.2mm	Clay	-0.005mm
Gravel	3 in.-5mm	Fine Sand	0.2mm-0.074mm		

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#### Other Office Locations:

CHALFONT, PA  
215.712.2700

SOUTHBOROUGH, MA  
508.485.0755

ROCKY HILL, CT  
860.726.7889

WALL, NJ  
732.592.2101

PHILADELPHIA, PA  
215.848.2323

BEDFORD, NH  
603.514.2230

TAMPA, FL  
813.851.0690

December 19, 2022

*via email*

**522 VALLEY ESTATES, LLC**  
164 Getty Avenue  
Clifton, New Jersey 07011

Attention: Ms. Gina Gufarotti  
Associate

**Regarding: STORMWATER MANAGEMENT AREA EVALUATION  
PROPOSED RESIDENTIAL REDEVELOPMENT  
522 VALLEY ROAD  
BLOCK 32.01, LOT 12  
CLIFTON, PASSAIC COUNTY, NEW JERSEY  
WHITESTONE PROJECT NO.: GJ2219439.001**

Dear Ms. Gufarotti:

Whitestone Associates, Inc. (Whitestone) is pleased to submit this *Stormwater Management (SWM) Area Evaluation* report in support of the proposed redevelopment referenced above. This report is based on the October 14, 2022 *Civil Plan Set* prepared by Koestner Associates, the annotated December 2, 2022 *Test Pit Location Markout* prepared by Stonefield Engineering & Design, LLC (Stonefield), correspondence with Stonefield, and Whitestone's previous experience at the subject site including the August 22, 2022 *Report of Limited Geotechnical Investigation & Slope Stability Analysis*.

## **1.0 PROJECT DESCRIPTION**

The subject site located at 522 Valley Road (Block 32.01, Lot 12) in Clifton, Passaic County, New Jersey houses a single-family dwelling with associated SWM facilities, pavements, landscaped areas, and utilities.

Based on correspondence with Insite, the proposed redevelopment will include demolition of the existing site structure and construction of 21 townhomes with associated new SWM facilities, retaining walls, pavements, landscaped areas, and utilities. Design details are not yet available, however, for the purposes of this proposal, Whitestone assumes the bottom of the SWM facilities will be situated approximately four feet below existing site grades.

## **2.0 SUMMARY OF FINDINGS**

**General:** The SWM area evaluation associated with this report was conducted by means of nine soil profile pits conducted with a rubber-tire backhoe. The subsurface tests were conducted in the presence of a Whitestone engineer who conducted field tests, recorded visual classifications, and collected samples of the various strata encountered. The tests were located in the field using normal taping procedures and estimated right angles. These locations are presumed to be accurate within a few feet. The test locations were terminated at a depth of approximately 10 feet below ground surface (fbgs) to 12 fbgs. The test locations associated with this investigation are shown on the *Test Location Plans* included as Figure 1. Details of the subsurface materials encountered are presented on the *Records of Subsurface Exploration* presented in Appendix A.

### *Other Office Locations:*

CHALFONT, PA  
215.712.2700

SOUTHBOROUGH, MA  
508.485.0755

ROCKY HILL, CT  
860.726.7889

WALL, NJ  
732.592.2101

PHILADELPHIA, PA  
215.848.2323

BEDFORD, NH  
603.514.2230

TAMPA, FL  
813.851.0690

MIAMI, FL  
786.783.6966

**Estimated Seasonal High Groundwater Levels & Infiltration Test Results:** The methods used in determining the seasonal high groundwater level include evaluating the soil morphology within a test excavation and identifying irregular spots or blotches of different colors or minerals unlike that of the surrounding soil (mottles). A summary of the estimated seasonal high groundwater observations as well as tested soil hydraulic conductivity results associated with the supplemental investigation are included in the following table.

INFILTRATION TEST RESULTS				
Profile Pit No.	ESHGW (fbgs/NAVD88)	USDA Classification @ Test Depth	Infiltration Test Results	
			Depth (fbgs/NAVD 88)	Infiltration Rate (inches/hour)
SPP-1	NE	Fill (Clay Loam)	5.1 / 317.9	< 0.2
SPP-2	NE	Fill (Clay Loam)	5.0 / 316.0	< 0.2
SPP-3	NE	Fill (Clay Loam)	5.2 / 319.8	< 0.2
SPP-4	NE	Fill (Clay Loam)	5.0 / 320.0	< 0.2
SPP-5	NE	Clay Loam	5.0 / 320	< 0.2
SPP-6	NE	Sandy Clay Loam	5.2 / 329.8	< 0.2
SPP-7	NE	Clay Loam	5.1 / 333.0	< 0.2
SPP-8	NE	NT	NT	NT
SPP-9	NE	NT	NT	NT

NE: Not Encountered; NT: Not tested due to rock structure and limiting zone; NAVD88: North American Vertical Datum of 1988

**Tested Soil Infiltration Rates:** In-situ infiltration testing was conducted within the proposed SWM areas at the test locations as outlined above. Testing was conducted via the single-ring infiltration testing method as detailed in the *New Jersey Stormwater Best Practices Manual*. Infiltration testing indicated infiltration rates less than 0.2 inches per hour (iph). Infiltration testing within SPP-8 and SPP-9 could not be conducted due to the presence of large rock within the soil subgrade at the proposed SWM facility bottom elevation. In-situ infiltration test results associated with the investigation are provided in Appendix B, *Soil Profile Pit Logs* are included in Appendix A.

### 3.0 CLOSING

Whitestone appreciates the opportunity to be of service to 522 Valley Estates, LLC. Please contact us with any questions or comments regarding the information herein.

Sincerely,

**WHITESTONE ASSOCIATES, INC.**



Kyle J. Kopacz, P.E.  
Associate



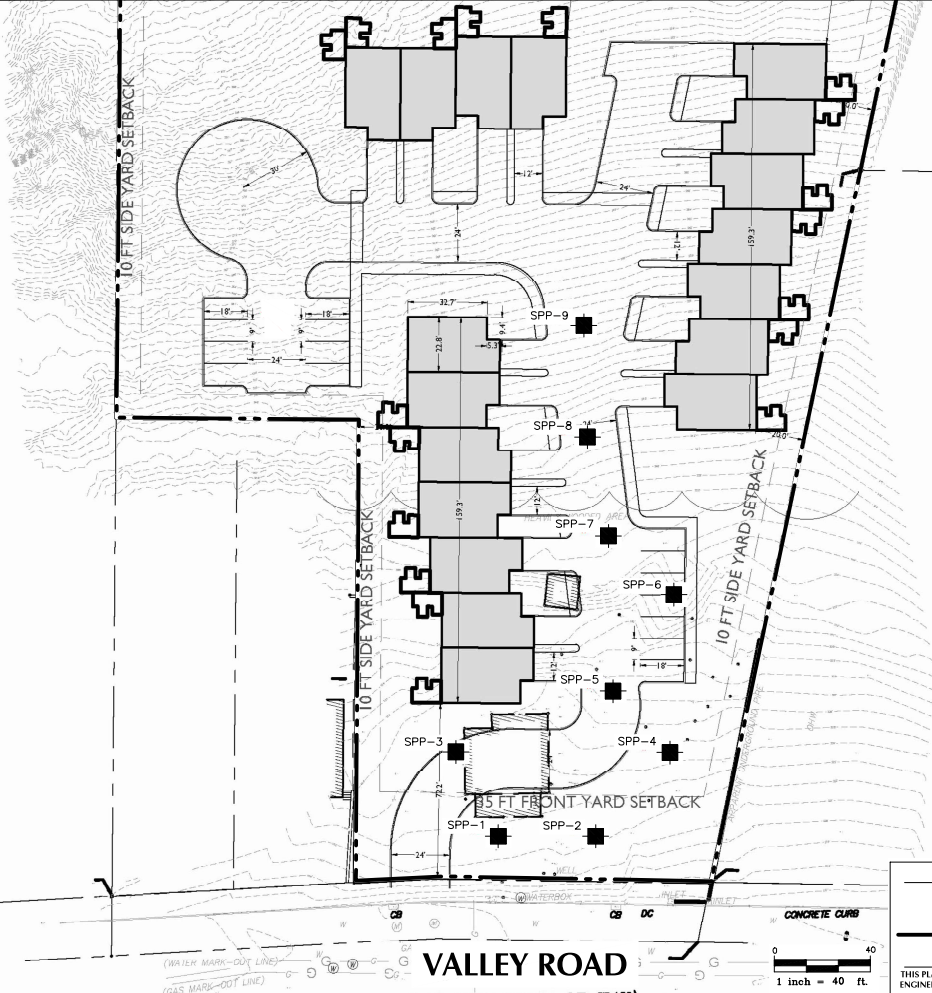
Laurence W. Keller, P.E.  
Vice President

CN/ri L:\Job Folders\2022\2219439GJ\Reports and Submittals\19439.001 SWM.docx  
 Enclosures  
 Copy: Jeffrey A. Martell, PE, PP, CME, LEED AP, Stonefield Engineering & Design, LLC  
 Josh Kline, Stonefield Engineering & Design, LLC  
 Afon Savitz, Stonefield Engineering & Design, LLC  
 John Corak, Stonefield Engineering & Design, LLC  
 Jonathan Istranyi, Stonefield Engineering & Design, LLC



**FIGURE 1**  
**Test Location Plan**

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**LEGEND**

- SPP-1 SOIL PROFILE PIT
- SUBJECT PROPERTY BOUNDARY

**REFERENCE**

THIS PLAN IS BASED ON AN DATED SITE PLAN PREPARED BY STONEFIELD ENGINEERING & DESIGN, LLC & ALL SITE LOCATIONS ARE APPROXIMATE.

**WHITESTONE**  
*An Employee-Owned Company*

30 INDEPENDENCE BOULEVARD, SUITE 250, WARREN, NJ 07059  
 908.668.7777 WHITESTONEASSOC.COM

<b>DRAWING TITLE:</b>	
<b>TEST LOCATION PLAN</b>	
<b>CLIENT:</b>	522 VALLEY ESTATES, LLC
<b>PROJECT:</b>	PROPOSED RESIDENTIAL REDEVELOPMENT CULFON, PASSAIC COUNTY, NJ

<b>PROJECT #:</b>	GJ2219439.001
<b>DESIGNED BY:</b>	GR
<b>DATE:</b>	12/19/22
<b>SCALE:</b>	1" = 40'
<b>SHEET #:</b>	1

**APPENDIX A**  
**Records of Subsurface Exploration**





# RECORD OF SUBSURFACE EXPLORATION

Soil Profile Pit No.: **SPP-1**

Page 1 of 1

<b>Project:</b> Proposed Residential Redevelopment		<b>WAI Project No.:</b> GJ2219439.001	
<b>Location:</b> 522 Valley Road; Clifton, Passaic County, NJ		<b>Client:</b> 522 Valley Estates, LLC	
<b>Surface Elevation:</b> ± 323.0 feet	<b>Date Started:</b> 12/5/2022	<b>Water Depth   Elevation</b> (feet bgs)   (feet)	<b>Estimated Seasonal High</b> <b>Groundwater Depth   Elevation</b> (feet bgs)   (feet)
<b>Termination Depth:</b> 12.0 feet bgs	<b>Date Completed:</b> 12/5/2022		
<b>Proposed Location:</b> SWM	<b>Logged By:</b> MO	<b>During:</b> NE   --- ▼	<b>At Completion:</b> NE   ---
<b>Excavating Method:</b> Test Pit Excavation	<b>Contractor:</b> Carrocia	<b>At Completion:</b> NE   --- ▼	
<b>Test Method:</b> Visual Observation	<b>Rig Type:</b> Backhoe	<b>24 Hours:</b> ---   --- ▼	

SAMPLE INFORMATION			DEPTH	HORIZON	DESCRIPTION OF MATERIALS (Classification)	REMARKS
Depth (feet)	Number	Type	feet			
			0.0			
			0 - 0.2	TOPSOIL	Topsoil	
			0.2 - 12	FILL	Yellowish-Red (5YR 4/6) CLAY LOAM; 5% Gravel; Moist; Crumb Structure; Friable; Few Roots;	
			1.0			
			2.0			
			3.0			
			4.0			
			5.0			
			6.0			
			7.0			
			8.0			
			9.0			
			10.0			
			11.0			
			12.0			
				GLACIAL DEPOSITS	Yellowish- Red (5YR 4/6) CLAY LOAM; 5% Gravel; Crumb Structure; Friable; No Roots	
						In-Situ Infiltration Test @ 5.1 fbgs
					Soil Profile Pit SPP-1 Terminated at a Depth of 12.0 Feet Below Ground Surface	
			13.0			
			14.0			
			15.0			

NOTES: bgs = below ground surface, NA = Not Applicable, NE = Not Encountered, NS = Not Surveyed, P = Perched

# RECORD OF SUBSURFACE EXPLORATION

<b>Project:</b> Proposed Residential Redevelopment		<b>WAI Project No.:</b> GJ2219439.001	
<b>Location:</b> 522 Valley Road; Clifton, Passaic County, NJ		<b>Client:</b> 522 Valley Estates, LLC	
<b>Surface Elevation:</b> ± 321.0 feet	<b>Date Started:</b> 12/5/2022	<b>Water Depth   Elevation</b> (feet bgs)   (feet)	<b>Estimated Seasonal High</b> <b>Groundwater Depth   Elevation</b> (feet bgs)   (feet)
<b>Termination Depth:</b> 12.0 feet bgs	<b>Date Completed:</b> 12/5/2022		
<b>Proposed Location:</b> SWM	<b>Logged By:</b> MO	<b>During:</b> NE   --- ▼	<b>At Completion:</b> NE   ---
<b>Excavating Method:</b> Test Pit Excavation	<b>Contractor:</b> Carrocia	<b>At Completion:</b> NE   --- ▼	
<b>Test Method:</b> Visual Observation	<b>Rig Type:</b> Backhoe	<b>24 Hours:</b> ---   --- ▼	

SAMPLE INFORMATION			DEPTH	HORIZON	DESCRIPTION OF MATERIALS (Classification)	REMARKS
Depth (feet)	Number	Type	feet			
			0.0			
			0 - 0.2	TOPSOIL	Topsoil	
			0.2 - 8	FILL	Brown (5YR 4/6) CLAY LOAM; 5% Gravel; Moist; Subangular Blocky Structure; Friable; Few Roots;	
5.0	S-1	BAG	1.0			
			2.0			
			3.0			
			4.0			
			5.0			
			6.0			
			7.0			
			8.0			
			8 - 11	GLACIAL DEPOSITS	Pinkish-Gray (5YR 6/2) SANDY LOAM; No Coarse Fragments; Moist; Crumb Structure; Soft; No Roots	In-Situ Infiltration Tests @ 5.0 fbs
			9.0			
10.0	S-2	BAG	10.0			
			11.0			
			11 - 12		Yellowish-Red (5YR 4/6) LOAMY SAND; No Coarse Fragments; Moist; Crumb Structure; Soft; No Roots	
			12.0			
			13.0			
			14.0			
			15.0			
			Soil Profile Pit SPP-2 Terminated at a Depth of 12.0 Feet Below Ground Surface			



# RECORD OF SUBSURFACE EXPLORATION

Soil Profile Pit No.: **SPP-3**

Page 1 of 1

<b>Project:</b> Proposed Residential Redevelopment		<b>WAI Project No.:</b> GJ2219439.001	
<b>Location:</b> 522 Valley Road; Clifton, Passaic County, NJ		<b>Client:</b> 522 Valley Estates, LLC	
<b>Surface Elevation:</b> ± 325.0 feet	<b>Date Started:</b> 12/5/2022	<b>Water Depth   Elevation</b> (feet bgs)   (feet)	<b>Estimated Seasonal High</b> <b>Groundwater Depth   Elevation</b> (feet bgs)   (feet)
<b>Termination Depth:</b> 12.0 feet bgs	<b>Date Completed:</b> 12/5/2022		
<b>Proposed Location:</b> SWM	<b>Logged By:</b> MO	<b>During:</b> NE   --- ▼	<b>At Completion:</b> NE   ---
<b>Excavating Method:</b> Test Pit Excavation	<b>Contractor:</b> Carrocia	<b>At Completion:</b> NE   --- ▼	
<b>Test Method:</b> Visual Observation	<b>Rig Type:</b> Backhoe	<b>24 Hours:</b> ---   --- ▼	

SAMPLE INFORMATION			DEPTH	HORIZON	DESCRIPTION OF MATERIALS (Classification)	REMARKS
Depth (feet)	Number	Type	feet			
			0.0			
			0 - 0.2	TOPSOIL	Topsoil	
			0.2 - 6	FILL	Yellowish-Brown (5YR 4/6) CLAY LOAM; 5% Gravel, 5% Cobble; Moist; Subangular Blocky Structure; Friable; Common Roots	
			1.0			
			2.0			
			3.0			
			4.0			
			5.0			
			6.0			
			6 - 12	GLACIAL DEPOSITS	Yellowish-Red (5YR 4/6) CLAY LOAM; 5% Gravel; 5% Cobbles; Fine; Subangular Blocky Structure; Friable; No Roots	
			7.0			
			8.0			
			9.0			
			10.0			
			11.0			
			12.0			
					Soil Profile Pit SPP-3 Terminated at a Depth of 12.0 Feet Below Ground Surface	
			13.0			
			14.0			
			15.0			

In-Situ Infiltration Test @  
5.2 fbgs

NOTES: bgs = below ground surface, NA = Not Applicable, NE = Not Encountered, NS = Not Surveyed, P = Perched



# RECORD OF SUBSURFACE EXPLORATION

Soil Profile Pit No.: **SPP-4**

Page 1 of 1

<b>Project:</b> Proposed Residential Redevelopment		<b>WAI Project No.:</b> GJ2219439.001	
<b>Location:</b> 522 Valley Road; Clifton, Passaic County, NJ		<b>Client:</b> 522 Valley Estates, LLC	
<b>Surface Elevation:</b> ± 325.0 feet	<b>Date Started:</b> 12/5/2022	<b>Water Depth   Elevation</b> (feet bgs)   (feet)	<b>Estimated Seasonal High</b> <b>Groundwater Depth   Elevation</b> (feet bgs)   (feet)
<b>Termination Depth:</b> 12.0 feet bgs	<b>Date Completed:</b> 12/5/2022		
<b>Proposed Location:</b> SWM	<b>Logged By:</b> MO	<b>During:</b> NE   --- ▼	<b>At Completion:</b> NE   ---
<b>Excavating Method:</b> Test Pit Excavation	<b>Contractor:</b> Carrocia	<b>At Completion:</b> NE   --- ▼	
<b>Test Method:</b> Visual Observation	<b>Rig Type:</b> Backhoe	<b>24 Hours:</b> ---   --- ▼	

SAMPLE INFORMATION			DEPTH	HORIZON	DESCRIPTION OF MATERIALS (Classification)	REMARKS	
Depth (feet)	Number	Type	feet				
5.0	S-1	BAG	0.0				In-Situ Infiltration Test @ 5.0
			0 - 0.5	TOPSOIL	Topsoil		
			0.5 - 7	FILL	Yellow-Red (5YR 4/6) CLAY LOAM; 5% Gravel, 5% Cobble; Moist; Crumb Structure; Friable; Few Roots		
			1.0				
			2.0				
			3.0				
			4.0				
			5.0				
			6.0				
			7.0				
7 - 10	GLACIAL DEPOSITS	Pinkish-Gray (5YR 6/2) SANDY LOAM; No Coarse Fragments; Moist; Subangular Blocky Structure; Soft; No Roots					
10 - 12		Yellowish-Red (5YR 4/6) LOAMY SAND; No Coarse Fragments; Moist; Granular Structure; Soft; No Roots					
12.0				Soil Profile Pit SPP-4 Terminated at a Depth of 12.0 Feet Below Ground Surface			
13.0							
14.0							
15.0							

NOTES: bgs = below ground surface, NA = Not Applicable, NE = Not Encountered, NS = Not Surveyed, P = Perched



# RECORD OF SUBSURFACE EXPLORATION

Soil Profile Pit No.: **SPP-5**

Page 1 of 1

<b>Project:</b> Proposed Residential Redevelopment		<b>WAI Project No.:</b> GJ2219439.001	
<b>Location:</b> 522 Valley Road; Clifton, Passaic County, NJ		<b>Client:</b> 522 Valley Estates, LLC	
<b>Surface Elevation:</b> ± 328.0 feet	<b>Date Started:</b> 12/5/2022	<b>Water Depth   Elevation</b> (feet bgs)   (feet)	<b>Estimated Seasonal High</b> <b>Groundwater Depth   Elevation</b> (feet bgs)   (feet)
<b>Termination Depth:</b> 12.0 feet bgs	<b>Date Completed:</b> 12/5/2022		
<b>Proposed Location:</b> SWM	<b>Logged By:</b> MO	<b>During:</b> NE   --- ▼	<b>At Completion:</b> NE   ---
<b>Excavating Method:</b> Test Pit Excavation	<b>Contractor:</b> Carrocia	<b>At Completion:</b> NE   --- ▼	
<b>Test Method:</b> Visual Observation	<b>Rig Type:</b> Backhoe	<b>24 Hours:</b> ---   --- ▼	

SAMPLE INFORMATION			DEPTH	HORIZON	DESCRIPTION OF MATERIALS (Classification)	REMARKS
Depth (feet)	Number	Type	feet			
			0.0			
			0 - 0.5	PAVEMENT	Asphalt and Subbase	
			0.5 - 12	FILL	Yellowish-Red (5YR 4/6) CLAY LOAM; 5% Gravel, 5% Cobble, 10% Boulder; Moist; Crumb Structure; Friable; Few Roots	
			5.0	GLACIAL DEPOSITS	Yellowish-Red (5YR 4/6) CLAY LOAM; 5% Gravel, 5% Cobble, Moist; Crumb Structure; Friable; No Roots	In-Situ Infiltration Test @ 5.0
			12.0		Soil Profile Pit SPP-5 Terminated at a Depth of 12.0 Feet Below Ground Surface	
			13.0			
			14.0			
			15.0			

NOTES: bgs = below ground surface, NA = Not Applicable, NE = Not Encountered, NS = Not Surveyed, P = Perched



# RECORD OF SUBSURFACE EXPLORATION

Soil Profile Pit No.: **SPP-6**

Page 1 of 1

<b>Project:</b> Proposed Residential Redevelopment		<b>WAI Project No.:</b> GJ2219439.001	
<b>Location:</b> 522 Valley Road; Clifton, Passaic County, NJ		<b>Client:</b> 522 Valley Estates, LLC	
<b>Surface Elevation:</b> ± 335.0 feet	<b>Date Started:</b> 12/5/2022	<b>Water Depth   Elevation</b> (feet bgs)   (feet)	<b>Estimated Seasonal High</b> <b>Groundwater Depth   Elevation</b> (feet bgs)   (feet)
<b>Termination Depth:</b> 12.0 feet bgs	<b>Date Completed:</b> 12/5/2022		
<b>Proposed Location:</b> SWM	<b>Logged By:</b> MO	<b>During:</b> NE   --- ▼	<b>At Completion:</b> NE   ---
<b>Excavating Method:</b> Test Pit Excavation	<b>Contractor:</b> Carrocia	<b>At Completion:</b> NE   --- ▼	
<b>Test Method:</b> Visual Observation	<b>Rig Type:</b> Backhoe	<b>24 Hours:</b> ---   --- ▼	

SAMPLE INFORMATION			DEPTH	HORIZON	DESCRIPTION OF MATERIALS (Classification)	REMARKS
Depth (feet)	Number	Type	feet			
			0.0			
			0 - 0.5	TOPSOIL	Topsoil	
			0.5 - 5	FILL	Yellowish-Red (5YR 4/6) CLAY LOAM; 5% Gravel, 20% Cobble 60% Boulder; Moist; Crumb Structure; Friable; No Roots	
			5 - 11	GLACIAL DEPOSITS	Yellowish-Red (5YR 5/6) SANDY CLAY LOAM; 10% Gravel; Moist; Crumb Structure; Friable; No Roots	In-Situ Infiltration Test @ 5.2 fbgs
			11.0		Soil Profile Pit SPP-6 Terminated at a Depth of 11.0 Feet Below Ground Surface Due to Restricted Reach	
			12.0			
			13.0			
			14.0			
			15.0			

NOTES: bgs = below ground surface, NA = Not Applicable, NE = Not Encountered, NS = Not Surveyed, P = Perched



# RECORD OF SUBSURFACE EXPLORATION

Soil Profile Pit No.: **SPP-7**

Page 1 of 1

<b>Project:</b> Proposed Residential Redevelopment		<b>WAI Project No.:</b> GJ2219439.001	
<b>Location:</b> 522 Valley Road; Clifton, Passaic County, NJ		<b>Client:</b> 522 Valley Estates, LLC	
<b>Surface Elevation:</b> ± 338.0 feet	<b>Date Started:</b> 12/5/2022	<b>Water Depth   Elevation</b> (feet bgs)   (feet)	<b>Estimated Seasonal High</b> <b>Groundwater Depth   Elevation</b> (feet bgs)   (feet)
<b>Termination Depth:</b> 11.0 feet bgs	<b>Date Completed:</b> 12/5/2022		
<b>Proposed Location:</b> SWM	<b>Logged By:</b> MO	<b>During:</b> NE   --- ▼	<b>At Completion:</b> NE   ---
<b>Excavating Method:</b> Test Pit Excavation	<b>Contractor:</b> Carrocia	<b>At Completion:</b> NE   --- ▼	
<b>Test Method:</b> Visual Observation	<b>Rig Type:</b> Backhoe	<b>24 Hours:</b> ---   --- ▼	

SAMPLE INFORMATION			DEPTH	HORIZON	DESCRIPTION OF MATERIALS (Classification)	REMARKS
Depth (feet)	Number	Type	feet			
			0.0			
			0 - 1	TOPSOIL	Topsoil	
			1.0			
			1 - 2.5	FILL	Light Brown (5YR 6/6) CLAY LOAM; 5% Gravel; Moist; Crumb Structure; Firm; Few Roots	
			2.0			
			2.5 - 11	GLACIAL DEPOSITS	Reddish-Brown (5YR 4/6) CLAY LOAM; 5% Gravel, 5% Cobble, 10% Boulder; Crumb Structure; Firm; No Roots	
			3.0			
			4.0			
			5.0			
			6.0			
			7.0			
			8.0			
			9.0			
			10.0			
			11.0			
			12.0		Soil Profile Pit SPP-7 Terminated at a Depth of 11.0 Feet Below Ground Surface Due to Restricted Reach	
			13.0			
			14.0			
			15.0			

In-Situ Infiltration Test @  
5.1 fbgs

NOTES: bgs = below ground surface, NA = Not Applicable, NE = Not Encountered, NS = Not Surveyed, P = Perched

# RECORD OF SUBSURFACE EXPLORATION

<b>Project:</b> Proposed Residential Redevelopment		<b>WAI Project No.:</b> GJ2219439.001	
<b>Location:</b> 522 Valley Road; Clifton, Passaic County, NJ		<b>Client:</b> 522 Valley Estates, LLC	
<b>Surface Elevation:</b> ± 343.0 feet	<b>Date Started:</b> 12/5/2022	<b>Water Depth   Elevation</b> (feet bgs)   (feet)	<b>Estimated Seasonal High</b> <b>Groundwater Depth   Elevation</b> (feet bgs)   (feet)
<b>Termination Depth:</b> 11.0 feet bgs	<b>Date Completed:</b> 12/5/2022		
<b>Proposed Location:</b> SWM	<b>Logged By:</b> MO	<b>During:</b> NE   --- ▼	<b>At Completion:</b> NE   ---
<b>Excavating Method:</b> Test Pit Excavation	<b>Contractor:</b> Carrocia	<b>At Completion:</b> NE   --- ▼	
<b>Test Method:</b> Visual Observation	<b>Rig Type:</b> Backhoe	<b>24 Hours:</b> ---   --- ▼	

SAMPLE INFORMATION			DEPTH	HORIZON	DESCRIPTION OF MATERIALS (Classification)	REMARKS
Depth (feet)	Number	Type	feet			
			0.0			
			0 - 1.2	TOPSOIL	Topsoil	
			1.2 - 11	GLACIAL DEPOSITS	Yellowish-Brown (5YR 4/6) SANDY CLAY LOAM; 15% Gravel, 10% Cobble, 15% Boulder; Moist; Crumb Structure; Firm; No Roots	
			11.0			
			12.0			
			13.0			
			14.0			
			15.0			
					Soil Profile Pit SPP-8 Terminated at a Depth of 11.0 Feet Below Ground Surface Due to Restricted Reach	





# RECORD OF SUBSURFACE EXPLORATION

Soil Profile Pit No.: **SPP-9**

Page 1 of 1

<b>Project:</b> Proposed Residential Redevelopment		<b>WAI Project No.:</b> GJ2219439.001	
<b>Location:</b> 522 Valley Road; Clifton, Passaic County, NJ		<b>Client:</b> 522 Valley Estates, LLC	
<b>Surface Elevation:</b> ± 354.0 feet	<b>Date Started:</b> 12/6/2022	<b>Water Depth   Elevation</b> (feet bgs)   (feet)	<b>Estimated Seasonal High</b> <b>Groundwater Depth   Elevation</b> (feet bgs)   (feet)
<b>Termination Depth:</b> 10.0 feet bgs	<b>Date Completed:</b> 12/6/2022		
<b>Proposed Location:</b> SWM	<b>Logged By:</b> MO	<b>During:</b> NE   --- ▼	<b>At Completion:</b> NE   ---
<b>Excavating Method:</b> Test Pit Excavation	<b>Contractor:</b> Carrocia	<b>At Completion:</b> NE   --- ▼	
<b>Test Method:</b> Visual Observation	<b>Rig Type:</b> Backhoe	<b>24 Hours:</b> ---   --- ▼	

SAMPLE INFORMATION			DEPTH	HORIZON	DESCRIPTION OF MATERIALS (Classification)	REMARKS
Depth (feet)	Number	Type	feet			
			0.0			
			0 - 1.5	TOPSOIL	Topsoil	
			1.0			
			1.5 - 10	GLACIAL DEPOSITS	Yellowish-Brown (5YR 4/6) SANDY CLAY LOAM; 10% Gravel, 10% Cobble, 20% Boulder; Moist; Crumb Structure; Friable; No Roots	
			2.0			
			3.0			
			4.0			
			5.0			
			6.0			
			7.0			
			8.0			
			9.0			
			10.0			
			11.0		Soil Profile Pit SPP-9 Terminated at a Depth of 10.0 Feet Below Ground Surface Due to Restricted Reach	
			12.0			
			13.0			
			14.0			
			15.0			

NOTES: bgs = below ground surface, NA = Not Applicable, NE = Not Encountered, NS = Not Surveyed, P = Perched



# **APPENDIX B**

## **Infiltration Test Results**



# INFILTRATION TEST

**Client:** 522 Valley Estates, LLC  
**Project:** Proposed Residential Redevelopment  
**Location:** 522 Valley Road  
Clifton, Passaic County, NJ  
**File No.** GJ2219439.001  
**Field Engineer:** MO

**Test Hole No.:** I-1@SPP-1  
**Date:** 12/5/2022  
**Weather:** Clear  
**Surface Elevation:** 323.00  
**Test Depth (Feet):** 5.1  
**Test Depth (Elevation):** NS

Reading No.	Time		Water Level Reading (inches)		Water Level Fall (Inches)	Time Interval (Hours)	Rate of Flow (Inches/Hour)
	Start	Finish	Start	Finish			
PS	10:03	11:03	3.0	2.875	0.125	1.0	0.875
1	11:04	11:34	3.0	3.0	0.0	0.5	0.0
2	11:34	12:04	3.0	3.0	0.0	0.5	0.0
<b>Remarks:</b>							Field $i$ = 0.0 in/hr

NOTES: PS = Pre Soak; NS = Not Surveyed



# INFILTRATION TEST

**Client:** 522 Valley Estates, LLC

**Test Hole No.:** I-2@SPP-2

**Project:** Proposed Residential Redevelopment

**Date:** 12/5/2022

**Location:** 522 Valley Road

**Weather:** Clear

Clifton, Passaic County, NJ

**Surface Elevation:** 321.0

**File No.** GJ2219439.001

**Test Depth (Feet):** 5.0

**Field Engineer:** MO

**Test Depth (Elevation):** NS

Reading No.	Time		Water Level Reading (inches)		Water Level Fall (Inches)	Time Interval (Hours)	Rate of Flow (Inches/Hour)
	Start	Finish	Start	Finish			
PS	10:33	11:33	3.0	3.0	0.0	1.0	0.0
1	11:33	12:03	3.0	3.0	0.0	0.5	0.0
2	12:03	12:33	3.0	3.0	0.0	0.5	0.0

**Remarks:**

Field  $i = 0.0$  in/hr

NOTES: PS = Pre Soak; NS = Not Surveyed



# INFILTRATION TEST

Client: 522 Valley Estates, LLC

Test Hole No.: I-3@SPP-3

Project: Proposed Residential Redevelopment

Date: 12/5/2022

Location: 522 Valley Road

Weather: Clear

Clifton, Passaic County, NJ

Surface Elevation: 325.0

File No. GJ2219439.001

Test Depth (Feet): 5.2

Field Engineer: MO

Test Depth (Elevation): NS

Reading No.	Time		Water Level Reading (inches)		Water Level Fall (Inches)	Time Interval (Hours)	Rate of Flow (Inches/Hour)
	Start	Finish	Start	Finish			
PS	9:26	10:26	3.0	3.0	0.0	1.0	0.0
1	10:26	10:56	3.0	3.0	0.0	0.5	0.0
2	10:56	11:26	3.0	3.0	0.0	0.5	0.0
<b>Remarks:</b>						Field <i>i</i> = 0.0 in/hr	

NOTES: PS = Pre Soak; NS = Not Surveyed



# INFILTRATION TEST

**Client:** 522 Valley Estates, LLC

**Test Hole No.:** I-4@SPP-4

**Project:** Proposed Residential Redevelopment

**Date:** 12/5/2022

**Location:** 522 Valley Road  
Clifton, Passaic County, NJ

**Weather:** Clear

**Surface Elevation:** 325.0

**File No.** GJ2219439.001

**Test Depth (Feet):** 5.0

**Field Engineer:** MO

**Test Depth (Elevation):** NS

Reading No.	Time		Water Level Reading (inches)		Water Level Fall (Inches)	Time Interval (Hours)	Rate of Flow (Inches/Hour)
	Start	Finish	Start	Finish			
PS	12:43	1:43	3.0	2.75	0.25	1.0	0.25
1	1:43	2:13	3.0	3.0	0.0	0.5	0.0
2	2:13	2:43	3.0	3.0	0.0	0.5	0.0
<b>Remarks:</b>						Field <i>i</i> = 0.0 in/hr	

NOTES: PS = Pre Soak; NS = Not Surveyed



# INFILTRATION TEST

**Client:** 522 Valley Estates, LLC

**Project:** Proposed Residential Redevelopment

**Location:** 522 Valley Road  
Clifton, Passaic County, NJ

**File No.** GJ2219439.001

**Field Engineer:** MO

**Test Hole No.:** I-5@SPP-5

**Date:** 12/5/2022

**Weather:** Clear

**Surface Elevation:** 325.0

**Test Depth (Feet):** 5.0

**Test Depth (Elevation):** NS

Reading No.	Time		Water Level Reading (inches)		Water Level Fall (Inches)	Time Interval (Hours)	Rate of Flow (Inches/Hour)
	Start	Finish	Start	Finish			
PS	1:28	2:28	3.0	2.875	0.125	1.0	0.1
1	2:28	2:58	3.0	3.0	0.0	0.5	0.0
2	2:58	3:28	3.0	3.0	0.0	0.5	0.0

**Remarks:** Field *i* = 0.0 in/hr

NOTES: PS = Pre Soak; NS = Not Surveyed



# INFILTRATION TEST

**Client:** 522 Valley Estates, LLC

**Test Hole No.:** I-6@SPP-6

**Project:** Proposed Residential Redevelopment

**Date:** 12/6/2022

**Location:** 522 Valley Road

**Weather:** Clear

Clifton, Passaic County, NJ

**Surface Elevation:** 335.0

**File No.** GJ2219439.001

**Test Depth (Feet):** 5.2

**Field Engineer:** MO

**Test Depth (Elevation):** NS

Reading No.	Time		Water Level Reading (inches)		Water Level Fall (Inches)	Time Interval (Hours)	Rate of Flow (Inches/Hour)
	Start	Finish	Start	Finish			
PS	8:42	9:42	3.0	2.75	0.25	1.0	0.3
1	9:42	10:12	3.0	3.0	0.0	0.5	0.0
2	10:12	10:42	3.0	3.0	0.0	0.5	0.0
<b>Remarks:</b>							Field <i>i</i> = 0.0 in/hr

NOTES: PS = Pre Soak; NS = Not Surveyed





**APPENDIX C**  
**Supplemental Information**  
**(USCS, Terms & Symbols)**

## UNIFIED SOIL CLASSIFICATION SYSTEM

### SOIL CLASSIFICATION CHART

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

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS FOR SAMPLES WITH 5% TO 12% FINES

#### GRADATION\*

% FINER BY WEIGHT

TRACE..... 1% TO 10%  
LITTLE..... 10% TO 20%  
SOME..... 20% TO 35%  
AND..... 35% TO 50%

#### COMPACTNESS\*

Sand and/or Gravel

RELATIVE DENSITY

LOOSE..... 0% TO 40%  
MEDIUM DENSE.... 40% TO 70%  
DENSE..... 70% TO 90%  
VERY DENSE..... 90% TO 100%

#### CONSISTENCY\*

Clay and/or Silt

RANGE OF SHEARING STRENGTH IN POUNDS PER SQUARE FOOT

VERY SOFT..... LESS THAN 250  
SOFT..... 250 TO 500  
MEDIUM..... 500 TO 1000  
STIFF..... 1000 TO 2000  
VERY STIFF..... 2000 TO 4000  
HARD..... GREATER THAN 4000

\* VALUES ARE FROM LABORATORY OR FIELD TEST DATA, WHERE APPLICABLE. WHEN NO TESTING WAS PERFORMED, VALUES ARE ESTIMATED.

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## GEOTECHNICAL TERMS AND SYMBOLS

### SAMPLE IDENTIFICATION

The Unified Soil Classification System is used to identify the soil unless otherwise noted.

### SOIL PROPERTY SYMBOLS

- N: Standard Penetration Value: Blows per ft. of a 140 lb. hammer falling 30" on a 2" O.D. split-spoon.  
 Qu: Unconfined compressive strength, TSF.  
 Qp: Penetrometer value, unconfined compressive strength, TSF.  
 Mc: Moisture content, %.  
 LL: Liquid limit, %.  
 PI: Plasticity index, %.  
 δd: Natural dry density, PCF.  
 ▽: Apparent groundwater level at time noted after completion of boring.

### DRILLING AND SAMPLING SYMBOLS

- NE: Not Encountered (Groundwater was not encountered).  
 SS: Split-Spoon - 1 3/8" I.D., 2" O.D., except where noted.  
 ST: Shelby Tube - 3" O.D., except where noted.  
 AU: Auger Sample.  
 OB: Diamond Bit.  
 CB: Carbide Bit  
 WS: Washed Sample.

### RELATIVE DENSITY AND CONSISTENCY CLASSIFICATION

<u>Term (Non-Cohesive Soils)</u>	<u>Standard Penetration Resistance</u>
Very Loose	0-4
Loose	4-10
Medium Dense	10-30
Dense	30-50
Very Dense	Over 50

<u>Term (Cohesive Soils)</u>	<u>Qu (TSF)</u>
Very Soft	0 - 0.25
Soft	0.25 - 0.50
Firm (Medium)	0.50 - 1.00
Stiff	1.00 - 2.00
Very Stiff	2.00 - 4.00
Hard	4.00+

### PARTICLE SIZE

Boulders	8 in.+	Coarse Sand	5mm-0.6mm	Silt	0.074mm-0.005mm
Cobbles	8 in.-3 in.	Medium Sand	0.6mm-0.2mm	Clay	-0.005mm
Gravel	3 in.-5mm	Fine Sand	0.2mm-0.074mm		

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