

November 23, 2022

Project # 22-08-0652

Meridian Engineering, Inc.
1199 Amboy Avenue, Suite 1D
Edison, NJ 08837

Attention: Mr. Leslie Walker P.E.
President

Reference: House of Worship
Neptune, NJ

Subject: Soil Profile Pits and Soil Permeability Testing

Dear Mr. Walker:

Per the request of Meridian Engineering, Inc, Atlantic Engineering Laboratories, LLC (AEL) has completed a subsurface exploration program and soil permeability testing. The study was undertaken to provide subsurface information relating to the expansion of an existing asphalt car parking lot and the onsite storm water management feature. The subsurface exploration was conducted on Tuesday, September 20, 2022.

Scope 1 – Stormwater Management Feature

As requested by Meridian Group, Inc, a total of two (2) soil profile pits, noted as Test Pit 1 and Test Pit 2, were excavated at the locations shown on the attached plan. The test pits were excavated using a Ford 535C rubber tired excavator. The test pits were excavated to depths of 8' and 6' below existing surface grades respectively.

An AEL field engineer was present during the excavation of the soil profile pits. The engineer classified the soils encountered and documented the findings on written test pit logs. Groundwater Elevations (if encountered) and Estimated Seasonal High Water Levels (if encountered) were also documented on the logs.

The following is a summary of our findings:

Soil Permeability Testing:

Soil permeability tests were conducted in the bottom of each profile pit using the percolation test method outlined in Chapter 12 of the BMP Manual.

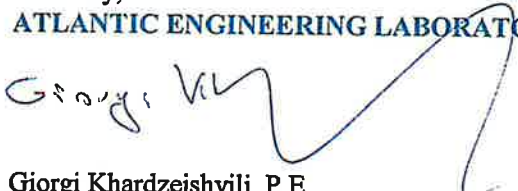
Soil permeability test results are presented in the following table:

Test Pit	Test Depth	Estimated Seasonal High Water Levels	Ground Water Level	Soil Permeability Rate (Inches Per Hour)
1	8'	Not encountered	Not encountered	7.5
2	6'	Not encountered	Not encountered	6.0

For design purposes, it is recommended that a factor of safety of 2 be applied to the permeability test results.

We hope that this information is helpful. Should you have any questions or require any additional information please do not hesitate to contact our office.

Sincerely,
ATLANTIC ENGINEERING LABORATORIES, LLC



Giorgi Khardzeishvili, P.E.
Vice President
GK/lt



Christopher T. O'Malley, P.E.
President

ATTACHMENTS

Site Location Map.....*Figure 1*

Site Plan/Location of Exploratory Test Pits..... *Figure 2*

Field Exploration..... *Appendix A*

Laboratory Testing..... *Appendix B*

Figure 1
SITE LOCATION MAP



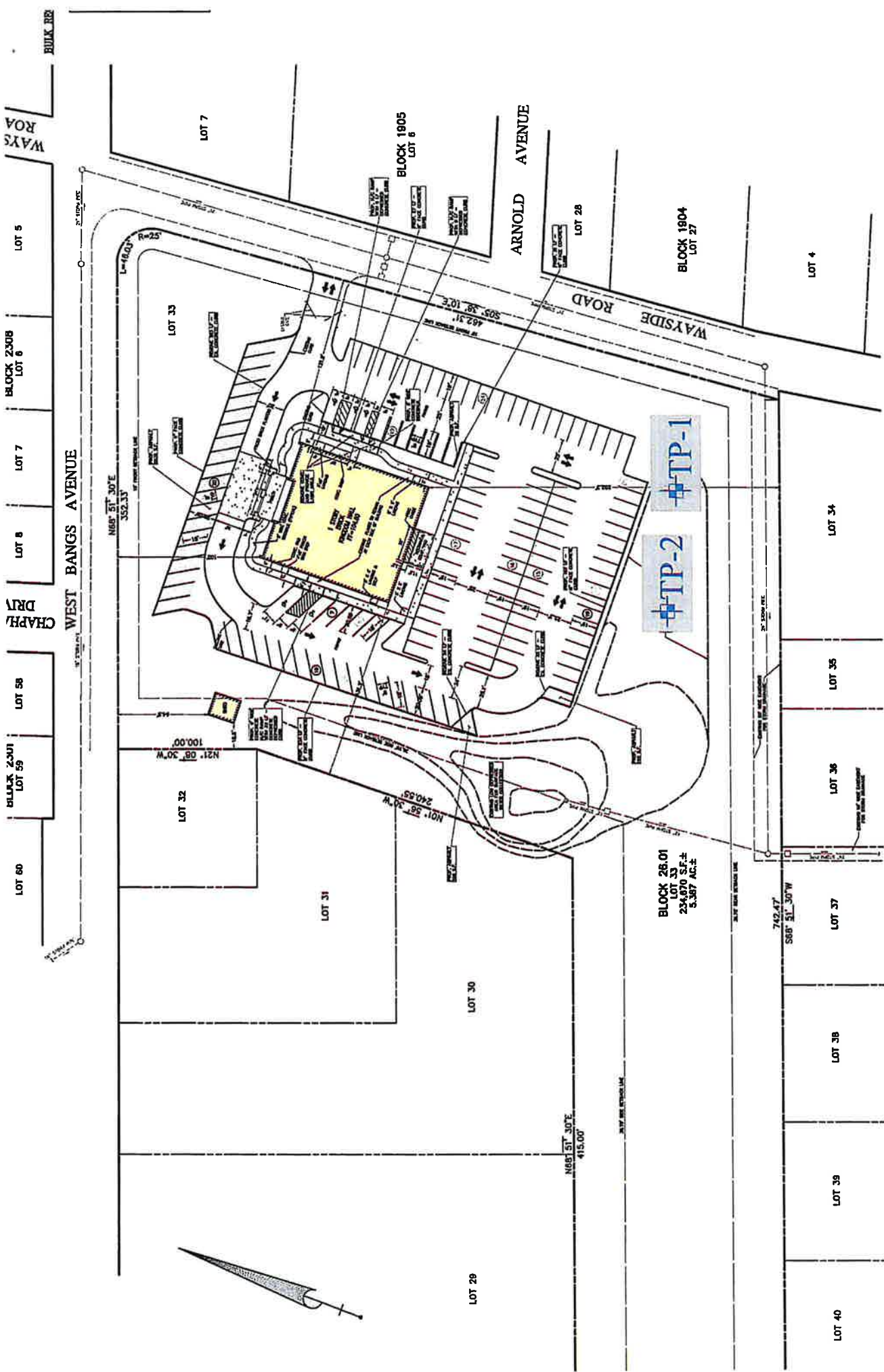
**HOUSE OF WORSHIP
NEPTUNE, NEW JERSEY
PROJECT: 22-08-0652**

NOVEMBER 2022

SITE LOCATION MAP

Figure 2

SITE PLAN/LOCATION OF EXPLORATORY TEST PITS



	<p>SOIL PERMEABILITY TESTING LOCATION PLAN</p>	<p>Project Title</p>	<p>HOUSE OF WORSHIP NEPTUNE, NEW JERSEY</p>
<p>Soil Permeability Location Plan:</p>			

APPENDIX A
FIELD EXPLORATION

Atlantic Engineering Laboratories, LLC

21 Randolph Avenue
Avenel, NJ 07001

TEST PIT LOG

PROJECT House of Worship - Neptune	TEST PIT NO. TP-1
CLIENT Meridian Engineering Group, Inc.	PROJECT NO. 22-08-0652
LOCATION 2900 West Bangs Avenue, Neptune, NJ	GROUND ELEV. N/A
EXCAVATION METHOD Ford 535C	ENGINEER C. Patel
DEPTH TO - Water: N/A When checked: N/A Caving: N/A	DATE 9/20/22
	SHEET 1 of 1

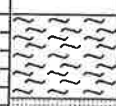
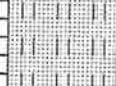

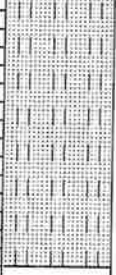
DEPTH (ft)	SOIL SYMBOLS AND SAMPLERS		MATERIAL DESCRIPTION	U.S.C.S. DESIGNATION	Comments
	GRAPHIC	BULK			
0			Ground Surface		
0			10 YR 5/2 5" Topsoil		
1			10 YR 7/8 Yellowish Brown fine to coarse SAND, trace to little Silt.		
4			10 YR 6/8 Yellow fine to medium SAND, trace to little Silt.		Groundwater Not Encountered
5					SHWL Not Observed
6					Soil Permeability Test was Performed at a Depth of 8'
7			10 R 7/1 Light Gray fine to medium SAND, trace Silt.		The Infiltration Rate at this Depth was Determined to Be 7.5 Inches per Hour
8			Test Pit Terminated @ 8'.		
9					
10					

Atlantic Engineering Laboratories, LLC

21 Randolph Avenue
Avenel, NJ 07001

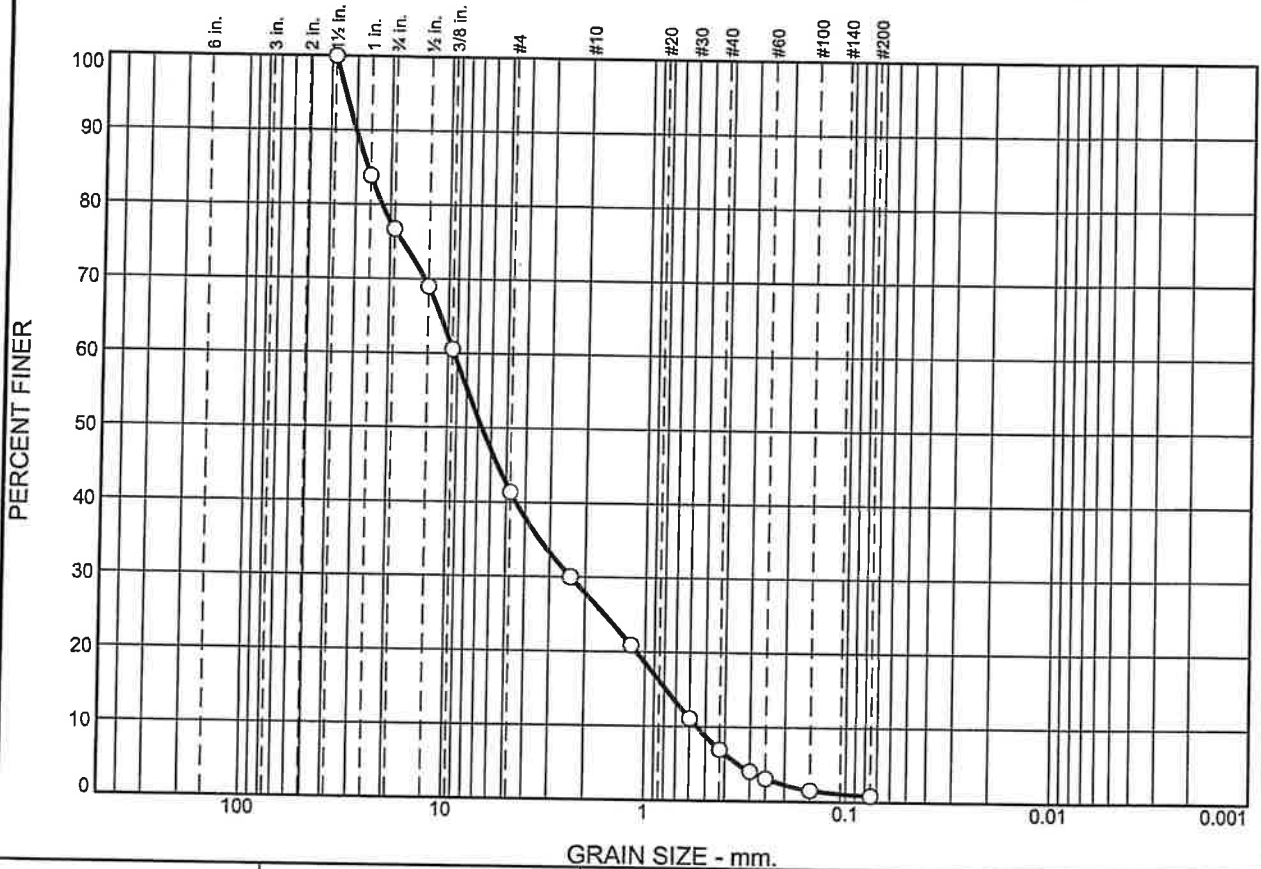
TEST PIT LOG

PROJECT House of Worship - Neptune	TEST PIT NO. TP-2
CLIENT Meridian Engineering Group, Inc.	PROJECT NO. 22-08-0652
LOCATION 2900 West Bangs Avenue, Neptune, NJ	GROUND ELEV. N/A
EXCAVATION METHOD Ford 535C	ENGINEER C. Patel
DEPTH TO - Water: N/A When checked: N/A Caving: N/A	DATE 9/20/22
	SHEET 1 of 1

DEPTH (ft)	SOIL SYMBOLS AND SAMPLERS		MATERIAL DESCRIPTION	U.S.C.S. DESIGNATION	Comments
	GRAPHIC	BULK			
0			Ground Surface		
0 - 1			10 YR 5/2 11" Topsoil		
1 - 3			10 YR 7/8 Yellowish Brown fine to coarse SAND, little Silt.		
3 - 6			10 YR 6/8 Yellow fine to medium SAND, trace to little Silt.		Groundwater Not Encountered SHWL Not Observed Soil Permeability Test was Performed at a Depth of 6'
6			Test Pit Terminated @ 6'.		The Infiltration Rate at this Depth was Determined to Be 6.0" Inches per Hour
7					
8					
9					
10					

APPENDIX B
LABORATORY TESTING

Particle Size Distribution Report



% +3"	% Gravel	% Sand		% Fines	
0.0	72.1	Coarse	Fine	Silt	Clay
		21.0	6.0	0.9	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1-1/2"	100.0		
1"	83.9		
3/4"	76.7		
1/2"	69.0		
3/8"	60.6		
#4	41.4		
#8	30.0		
#16	20.9		
#30	11.1		
#40	6.9		
#50	4.1		
#60	3.1		
#100	1.6		
#200	0.9		

Material Description

Grayish Black well-graded GRAVEL with Sand (Asphalt)

Atterberg Limits

PL= NP LL= NV PI=

Coefficients

D₉₀= 30.0674 D₈₅= 26.2536 D₆₀= 9.3509
D₅₀= 6.6902 D₃₀= 2.3582 D₁₅= 0.7864
D₁₀= 0.5510 C_u= 16.97 C_c= 1.08

Classification

USCS= GW AASHTO= A-1-a

Remarks

Natural Moisture Content = 5.4%

* (no specification provided)

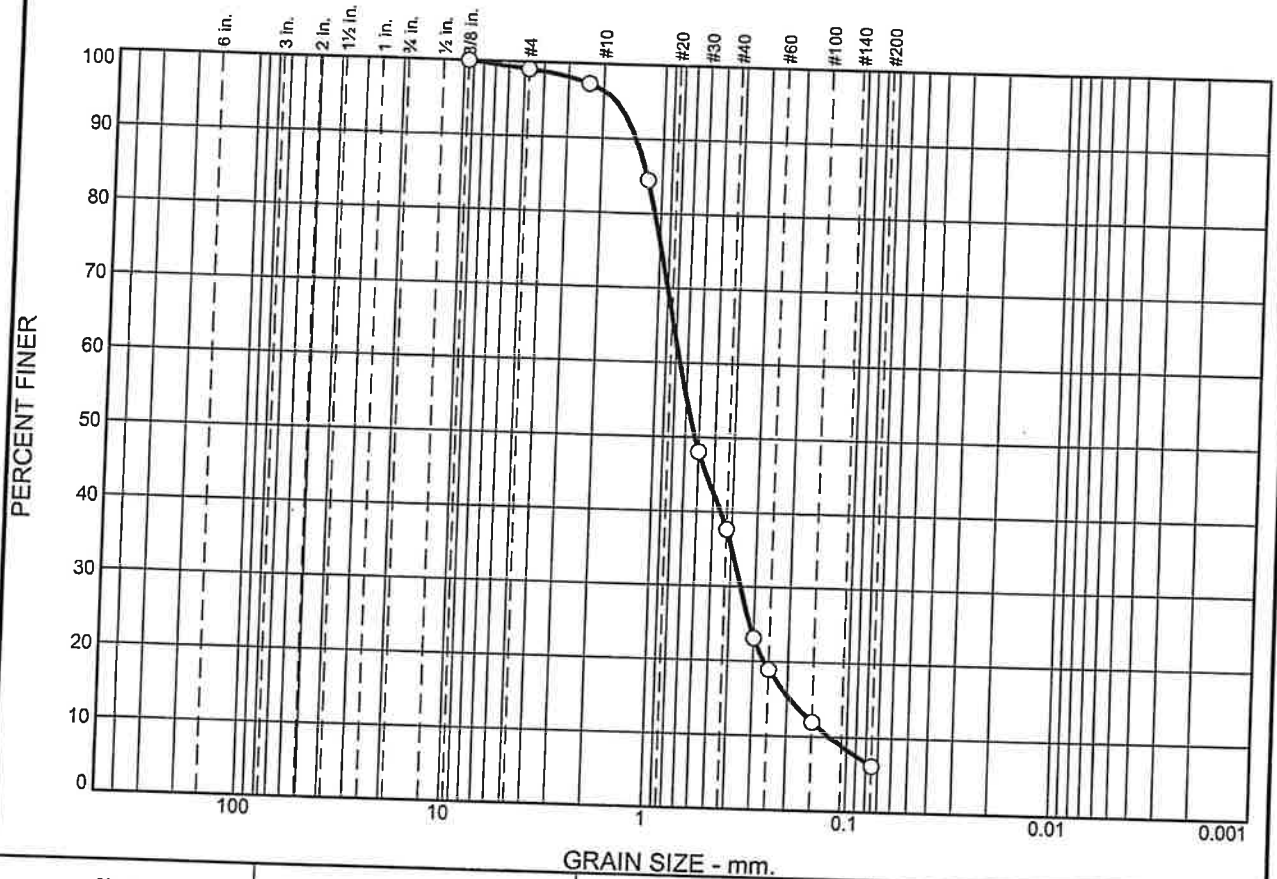
Source of Sample: TP-1 (Pavement Subbase)
Sample Number: 11405

Date: 09/27/2022

Atlantic Engineering Laboratories Avenel, NJ	Client: Meridian Engineering Group, Inc. Project: House of Worship - Parking Lot Expansion - 2900 West Bangs Avenue, Neptune, NJ Project No: Meridian Engineering Figure
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Tested By: L. Perez Checked By: CTO

Particle Size Distribution Report



% +3"	% Gravel	% Sand		% Fines	
		Coarse	Fine	Silt	Clay
0.0	3.7	58.7	31.4	6.2	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/8"	100.0		
#4	99.0		
#8	97.3		
#16	84.5		
#30	48.0		
#40	37.6		
#50	23.1		
#60	18.9		
#100	11.9		
#200	6.2		

* (no specification provided)

Material Description

Yellowish Tan well-graded SAND with Silt

Atterberg Limits
 PL= NP LL= NV PI=

Coefficients
 D₉₀= 1.3732 D₈₅= 1.1944 D₆₀= 0.7645
 D₅₀= 0.6303 D₃₀= 0.3554 D₁₅= 0.1946
 D₁₀= 0.1224 C_u= 6.24 C_c= 1.35

Classification
 USCS= SW-SM AASHTO= A-1-b

Remarks
 Natural Moisture Content = 3.3%

Source of Sample: TP-1 (1'-4')
 Sample Number: 11406

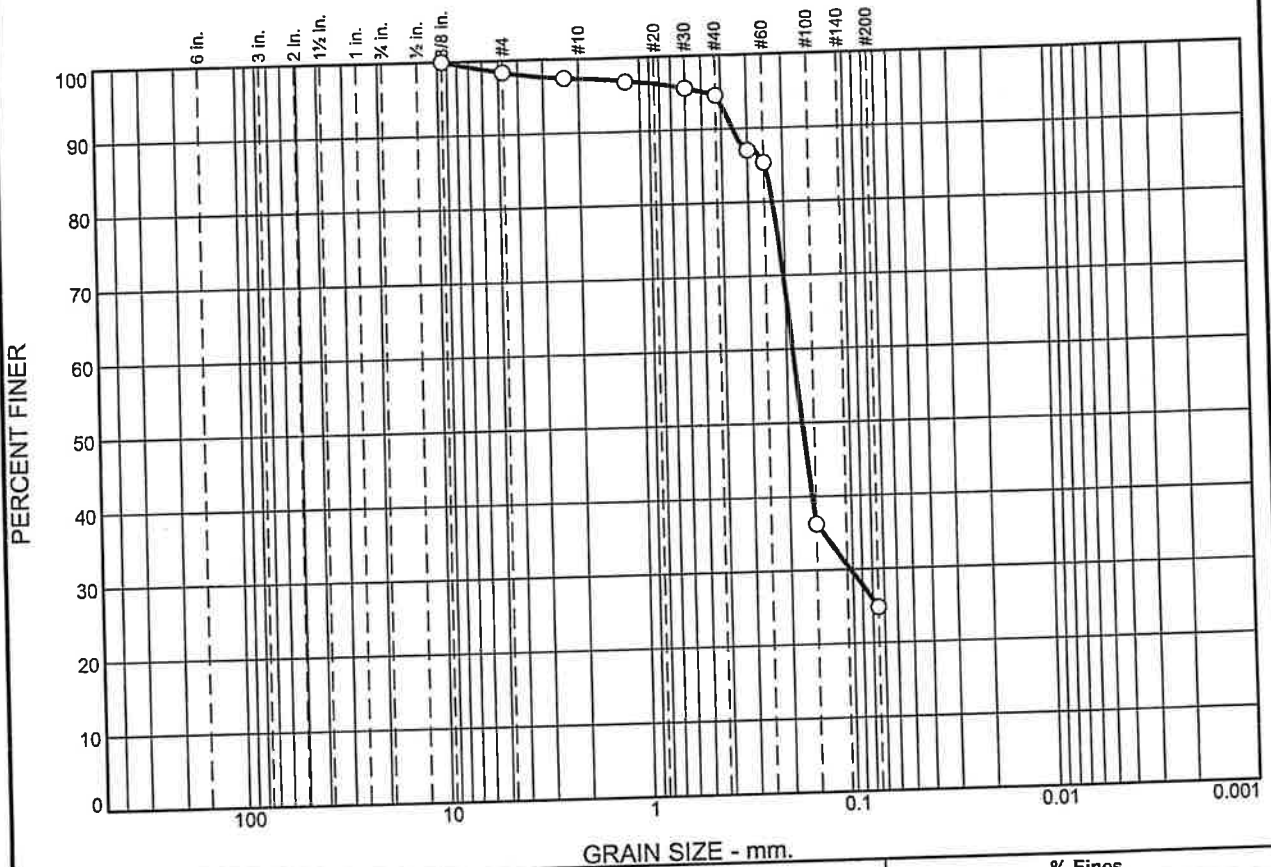
Date: 09/27/2022

Atlantic Engineering Laboratories Avenel, NJ	Client: Meridian Engineering Group, Inc. Project: House of Worship - Parking Lot Expansion - 2900 West Bangs Avenue, Neptune, NJ Project No: Meridian Engineering
	Figure

Tested By: L. Perez

Checked By: CTO

Particle Size Distribution Report



% +3"	% Gravel	% Sand		% Fines	
		Coarse	Fine	Silt	Clay
0.0	2.7	2.8	69.7	24.8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/8"	100.0		
#4	98.4		
#8	97.4		
#16	96.7		
#30	95.6		
#40	94.5		
#50	87.0		
#60	85.3		
#100	36.3		
#200	24.8		

Material Description

Yellowish Tan silty SAND

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₉₀= 0.3533 D₈₅= 0.2478 D₆₀= 0.1867
D₅₀= 0.1713 D₃₀= 0.1025 D₁₅=
D₁₀= C_u= C_c=

Classification

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

Remarks

Natural Moisture Content = 13.9%

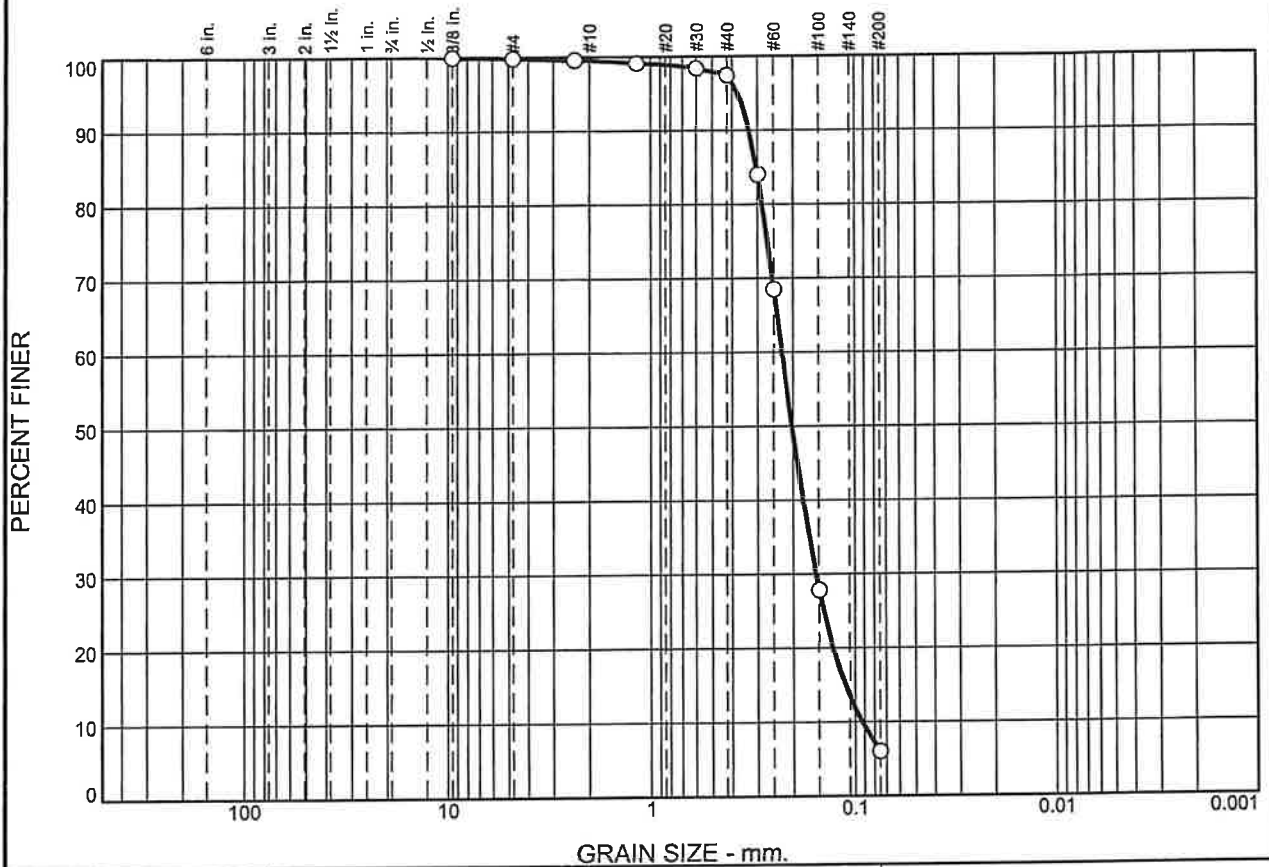
* (no specification provided)

Source of Sample: TP-1 (4'-7')
Sample Number: 11400

Date: 09/22/2022

Atlantic Engineering Laboratories Avenel, NJ	Client: Meridian Engineering Group, Inc. Project: House of Worship - Parking Lot Expansion - 2900 West Bangs Avenue, Neptune, NJ Project No: Meridian Engineering Figure
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Particle Size Distribution Report



% +3"	% Gravel	% Sand		% Fines	
		Coarse	Fine	Silt	Clay
0.0	0.5	2.1	91.4	6.0	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/8"	100.0		
#4	99.8		
#8	99.6		
#16	99.1		
#30	98.3		
#40	97.4		
#50	84.0		
#60	68.5		
#100	27.8		
#200	6.0		

Material Description

Light Yellowish Tan poorly graded SAND with Silt

Atterberg Limits

PL= NP LL= NV PI=

Coefficients

D₉₀= 0.3313 D₈₅= 0.3044 D₆₀= 0.2277
D₅₀= 0.2031 D₃₀= 0.1555 D₁₅= 0.1120
D₁₀= 0.0924 C_u= 2.47 C_c= 1.15

Classification

USCS= SP-SM AASHTO= A-3

Remarks

Natural Moisture Content = 6.2%

* (no specification provided)

Source of Sample: TP-1 (7'-8')
Sample Number: 11401

Date: 09/26/2022

Atlantic Engineering Laboratories Avenel, NJ	Client: Meridian Engineering Group, Inc. Project: House of Worship - Parking Lot Expansion - 2900 West Bangs Avenue, Neptune, NJ Project No: Meridian Engineering Figure
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Definition of Soil Components and Fractions

1. Grain Size

Material	Fraction	Sieve Size
Boulders		12"+
Cobbles		3" – 12"
Gravel	Coarse Fine	¾" – 3" #4 to ¾"
Sand	Coarse Medium Fine	#10 to #4 #40 to #10 #200 to #40
Fines (Silt & Clay)		Passing #200

2. Coarse-Grained and Fine-Grained Soils

Description Adjective	Percentage Requirement
Trace	1-10%
Little	10-20%
Some	20-35%
And	35-50%

3. Fine-Grained Soils. Identify in accordance with plasticity characteristics, dry strength, and toughness as described in Table 3

Stratified Soils	Descriptive Term	Thickness
	Alternating thick thin with parting	0 to 1/16" thickness
	Seam	1/16" to ½" thickness
	Layer	½" to 12" thickness
	Stratum	Greater than 12" thickness
	Varved clay	Alternating seams of layers of sand, silt and clay
	Pocket	Small, erratic deport, usually less than 1' foot
	Lens	Lenticular deposit
	Occasional	One or less per foot of thickness
	Frequent	More than one foot of thickness

End of Report

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