

Report of Subsurface Exploration &
Stormwater Management Assessment

Atrium Drive Warehouse Development
Franklin Township, Somerset County, New Jersey



Mr. Kris Bauman
Woodmont Properties
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Fairfield, NJ 07004



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April 7, 2023

Mr. Kris Bauman

Woodmont Properties

100 Passaic Avenue, Suite 240
Fairfield, New Jersey, 07004

Re: Report of Subsurface Exploration &
Stormwater Management Assessment
Atrium Drive Warehouse Development
Block 468.01, Lots 21.06 & 21.14
Franklin Township, Somerset County, New Jersey
FPA No. 17038.001R2

Dear Mr. Bauman:

INTRODUCTION

This report presents the results of our Subsurface Exploration and Stormwater Management Assessment performed in connection with the proposed Warehouse Development to be constructed in Franklin Township, Somerset County, New Jersey. The property is designated as Block 468.01, Lots 21.06 & 21.14 on the Franklin Township Tax Map. The site is bound by Atrium Drive to the southwest and NJ State Route 287 to the northeast. The regional location of the project site is presented on Drawing No. 1, "Regional Location Plan."

Based on the site plan provided by the Client, the proposed project will include the construction of two warehouse buildings. The proposed buildings will have plan areas of approximately 294,400 and 132,000 square feet and will be supported on slab-on-grade foundations. Additional improvements will include paved driveways and parking areas as well as associated site utilities and stormwater management facilities. The site consists of approximately 30 acres. The southwesterly half of the site is occupied by paved parking lots and a five-story office building. The northeasterly half of the site consists of a moderately wooded area of undeveloped land.

A geotechnical subsurface exploration was performed at the project site by French and Parrello Associates (FPA) in April 2021. The subsurface conditions encountered across the entire site consisted primarily of fine-grained soils underlain by decomposed shale bedrock which exhibit very low permeability rates and are generally indicative of a site considered to be within Hydrologic Soil Group (HSG) D. Within the undeveloped portion of the site to the northeast (Lot 21.14), the soils currently mapped at the project site by the United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) presented on the Web Soil Survey are HSG DunB and PenC. These designations are within HSG A and HSG C, respectively, and represent soil with some level of infiltration capacity. As such, the current HSG mapping of the site relative to the USDA was in question and instigated the need for further study.



The purpose for our involvement on the project at this time was to perform an additional subsurface exploration and laboratory testing of the in-situ soils to verify the HSG for the development portion of the site to the northeast (Lot 21.14).

FPA 2021 SUBSURFACE EXPLORATION

The subsurface conditions within lot 21.14 were explored through the advancement of 6 test borings in April 2021 to characterize the subsurface and groundwater conditions. The approximate test boring locations are presented on Drawing No. 2, "Test Pit Location Plan." Details of the conditions encountered in the test boring are presented on the individual test boring logs included in Appendix A.

FPA 2022 SUBSURFACE EXPLORATION & LABORATORY TESTING

Subsurface Exploration

A total of 14 test pits were advanced within Lot 21.14 on March 17, 2023 and March 20, 2023 in order to assess the HSG of the site. The approximate test pit locations are presented on Drawing No. 2, "Test Pit Location Plan." Details of the conditions encountered in the test pits are presented on the individual test pit logs included in Appendix B. Undisturbed soil samples were collected during the advancement of the test pits utilizing thin-walled tube samplers in general accordance with ASTM-D1587.

Laboratory Testing

The collected soil samples were returned to our in-house soils laboratory and subjected to laboratory testing to assess the permeability rates of the in-situ soils. Flexible Wall Permeability Tests were performed in accordance with ASTM D-5084. A total of 13 permeability tests were performed to assess the HSG of the site. It is our opinion that the subsurface exploration and laboratory testing programs performed were appropriate to determine the sites HSG. The results of the laboratory testing are presented in Appendix C.

SITE CONDITIONS

Regional Geology

Based on our review of published geologic literature pertaining to the project region, and our prior experience in the area, the geologic conditions at the project site should consist of a thin layer of residual silt and silty clay overlying Shale Bedrock identified as Brunswick Shale on the Geologic Map of New Jersey. The depth to bedrock ranges from 2 to 6 feet in the immediate project vicinity.

Subsurface Conditions

The subsurface conditions encountered during our subsurface exploration were generally consistent with those reported in the published geologic literature. The test borings the test pits typically encountered cohesive residual soils underlain by decomposed and highly weathered Shale bedrock. The cohesive residual soils were encountered from the existing grade to depths ranging from approximately 1 foot to 6 feet below the existing grade and consisted of clay and silt intermixed with minor to moderate amounts of coarse to fine sand and varying amounts of coarse to fine gravel. The amount of gravel typically increased with depth. Decomposed and highly weathered Shale was encountered below the residual soils and may be described as clay and silt intermixed with moderate to significant amounts of coarse to fine gravel and coarse to fine sand as well as moderate amounts of cobble sized Shale pieces.



Based on the results of the Standard Penetration Testing, the consistency of the cohesive residual soils and decomposed Shale bedrock varied from firm to hard, typically increasing with depth.

The static groundwater table was not encountered within the test borings, although perched or trapped groundwater was encountered within test pits TP-2, TP-3, TP-6, and TP-7 at depths ranging from approximately 4 feet to 7.5 feet below the existing ground surface. The remaining test pits and test borings were dry. Seasonal and storm related fluctuations in the groundwater level, as well as the potential presence of perched groundwater, should be anticipated. For a more detailed description of the subsurface conditions encountered, please refer to the test boring logs in Appendix A and test pit logs in Appendix B.

DISCUSSION & RECOMMENDATIONS

Hydrologic Soil Group

The subsurface conditions observed within the test pits indicate a hydraulically restrictive soil horizon overlies the project site. As previously indicated, the soil consists of silt and clay overlying weathered Shale bedrock. The consistency of this horizon was stiff to very stiff. The permeability of the in-situ soils was assessed by performing Flexible Wall Permeability Tests in accordance with ASTM D-5084. Based on the results of the laboratory testing, permeability rates range from approximately 0.000036 inches per hour to 0.14 inches per hour. The results of the laboratory testing are presented in Appendix C.

Based on the guidance documents to establish a HSG, the permeability rate of the surficial soil horizon to be classified as a HSG D must be equal to or less than 0.14 inches per hour, indicating that very high surface runoff is occurring. Based on the results of our subsurface exploration and laboratory testing programs, we recommend that the site be classified as HSG D.

CLOSING & LIMITATIONS

The scope of our services did not include any environmental assessment or investigation for the presence or absence of wetlands, chemically hazardous, or biologically toxic materials in the soil, surface water, groundwater or air, on or below or around the site.

Services performed by FPA during this project have been conducted in a manner consistent with the level of care and skill ordinarily exercised by members of the profession currently practicing in the same locality under similar conditions. No other representation, expressed or implied, and no warranty or guarantee is included or intended in the services provided.

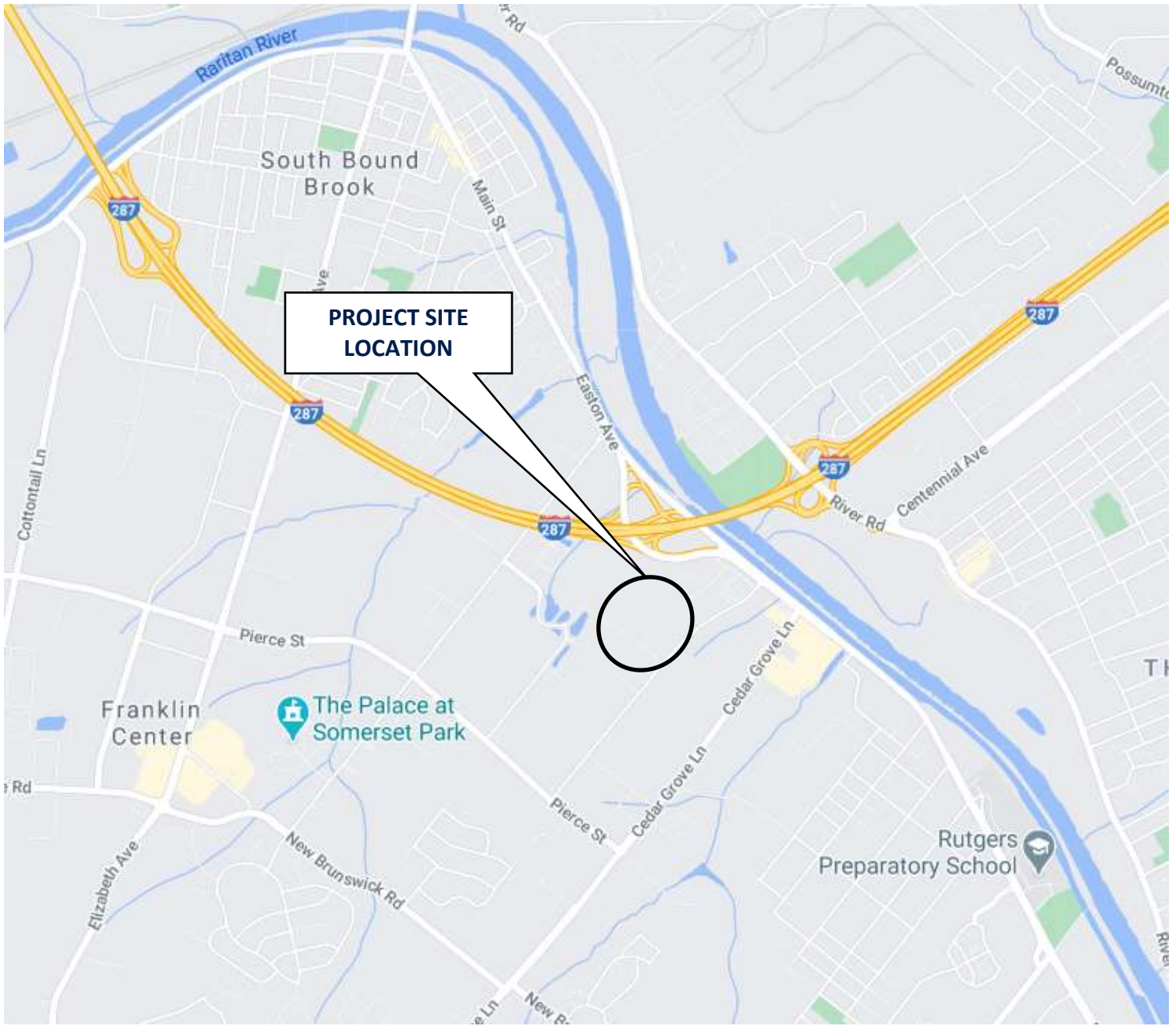
Should you have any questions or if we can be of service to you in the future, please feel free to contact us.

Sincerely,

FRENCH & PARRELLO ASSOCIATES

A handwritten signature in blue ink, appearing to read 'R. Knotz', is written over a light blue horizontal line.

Robert D. Knotz, PE
Project Consultant

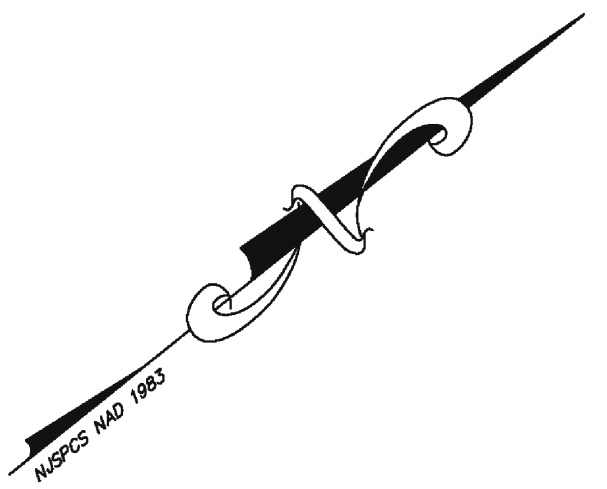
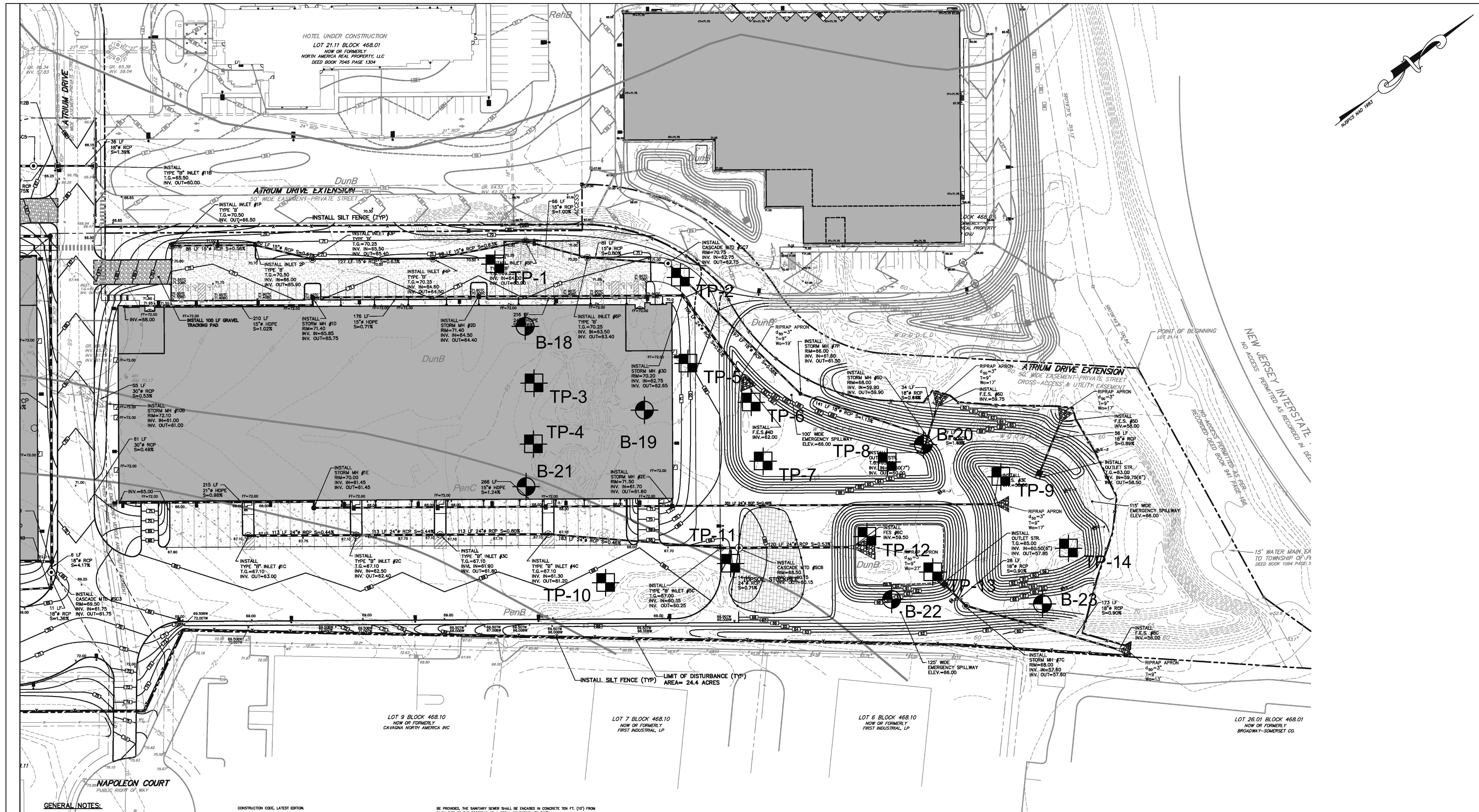


REGIONAL LOCATION PLAN

Copyright Google Maps, 2023

**ATRIUM DRIVE WAREHOUSE DEVELOPMENT
FRANKLIN TOWNSHIP, SOMERSET COUNTY, NEW JERSEY**

SCALE: NTS	DATE: April 2023	JOB NO.: 17038.001	DRAWING NO.: 1
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LEGEND:

B-1 2021 TEST BORING LOCATION

TP-1 2023 PIT LOCATION

No.	Date	Revision	Revised By	Checked By

SCALE IN FEET

0 50 100

FPA
FRENCH & PARRELLO ASSOCIATES
 New Jersey • New York • Pennsylvania • Georgia

Corporate Office:
 1800 Rt. 34, Suite 101
 Wall, New Jersey 07719
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TEST BORING & TEST PIT LOCATION PLAN
 FOR
ATRIUM DRIVE WAREHOUSE DEVELOPMENT

BLOCK 468.01
 LOTS 21.06 & 21.14
 FRANKLIN TOWNSHIP
 SOMERSET COUNTY NEW JERSEY

DATE:	MARCH 2023	DESIGNED BY:		SCALE:	1"=50'	PROJECT NUMBER:	17038.001
DRAWN BY:	DMR	CHECKED BY:	RDK	FIELD BOOK:		DRAWING NO.:	2

\P\17038\17038 - Atrium Drive Warehouse Development\CAD\17038.001 - Test Boring Location Plan.dwg 2023

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 DUE TO INHERENT ERRORS IN REPRODUCTION METHODS, ERRORS MAY OCCUR WHEN SCALING THIS DRAWING.



Appendix A

Test Boring Logs

BURMISTER SOIL CLASSIFICATION SYSTEM

A. Cohesionless Soils: Particle Size Definitions

Soil	Fraction	U.S. Standard Sieve	Actual Sizes
Gravel	coarse	3 in. to 1 in.	76 mm to 25 mm
	medium	1 in. to 3/8 in.	25 mm to 9.5 mm
	fine	3/8 in. to No. 10	9.5 mm to 2.0 mm
Sand	coarse	No. 10 to No. 30	2.0 mm to 0.6 mm
	medium	No. 30 to No. 60	0.6 mm to 0.25 mm
	fine	No. 60 to No. 200	0.25 mm to 0.075 mm
Silt		< No. 200	< 0.075 mm

B. Terms Describing Gradation of Cohesionless Soils

Written Description	Symbol/Designation	Defining Proportions
coarse, medium to fine	cmf	all fractions > 10%
coarse to medium	cm	< 10% fine
medium to fine	mf	< 10% coarse
coarse	c	< 10% medium and fine
medium	m	< 10% coarse and fine
fine	f	< 10% coarse and medium

Note: Use (+) for upper limit and (-) for lower limit.

C. Cohesive Soils: Terms Describing Plasticity

Soil	Plasticity Index	Workability	Plasticity Description
SILT	0	--	Non-Plastic
Clayey SILT	1 to 5	1/4 in. thread	Slightly Plastic
SILT & CLAY	5 to 10	1/8 in. thread	Low Plasticity
CLAY & SILT	10 to 20	1/16 in. thread	Medium Plasticity
Silty CLAY	20 to 40	1/32 in. thread	High Plasticity
CLAY	>40	1/64 in. thread	Very High Plasticity

D. Terms Describing Overall Composition of Soil

Written Proportion	Proportion Symbol	Proportion Percent by Weight
and	a	35 to 50
some	s	20 to 35
little	l	10 to 20
trace	t	1 to 10

Note: Use (+) for upper limit and (-) for lower limit.



TEST BORING LOG

**ATRIUM DRIVE WAREHOUSE DEVELOPMENT
FRANKLIN TOWNSHIP, SOMERSET COUNTY, NEW JERSEY
(FPA PROJECT NO. 17038.001)**

**BORING NO.: B-18
SHEET: 1 OF 1**

DATE STARTED: 4/2/2021
DATE FINISHED: 4/2/2021

DEPTH OF WATER: Dry
LOCATION: See Plan

GROUND ELEVATION: N/A
GROUND WATER ELEV.: N/A

DRILLING TECHNIQUE: Mud Rotary
HAMMER TYPE: 140 lb. Automatic Trip Hammer, 30 Inch Drop

DEPTH FEET	SAMPLE DEPTH	SPT BLOW COUNTS (PER 6")	STRATA	DESCRIPTION OF SOIL
---	S-1 0-2'	2 - 2 - 3 - 1		S-1 Red-Brown SILT & CLAY , little ⁺ cmf ⁺ Sand, trace f Gravel.
	S-2 2-4'	4 - 4 - 6 - 5		S-2 Brown CLAY & SILT , trace f Sand.
--- 5' ---	S-3 4-6'	25 - 41 - 41 - 43		S-3 Red-Brown SILT & CLAY , some ⁻ mf Sand, little ⁻ mf ⁺ Gravel.
	S-4 6-8'	50/4" - X - X - X		S-4 Red-Brown SILT & CLAY , some ⁺ cmf ⁺ Gravel, little ⁻ mf Sand. (completely weathered Shale)
	S-5 8-10'	38 - 50/1" - X - X		S-5 Same as S-4 .
--- 10' ---	S-6 10-12'	11 - 33 - 50/2" - X		S-6 Red-Brown CLAY & SILT , and cmf Gravel, trace ⁺ cmf ⁺ Sand. (completely weathered Shale)
	--- 15' ---	S-7 15-17'		
END OF BORING AT 15.1'				
--- 20' ---				
--- 25' ---				
--- 30' ---				
--- 35' ---				

SOILS ENGINEER: R. KNOTZ, PE
DRILLING INSPECTOR: M. MILGROM

CONTRACTOR: BORING BROTHERS
DRILLER: S. HEADLY

The information shown hereon indicates the subsurface conditions encountered at the specific boring location on the date(s) of drilling. Subsurface conditions are likely to vary across the project site. Interpretation of the subsurface data shall be at the discretion of the user.



TEST BORING LOG

**ATRIUM DRIVE WAREHOUSE DEVELOPMENT
FRANKLIN TOWNSHIP, SOMERSET COUNTY, NEW JERSEY
(FPA PROJECT NO. 17038.001)**

BORING NO.: B-19
SHEET: 1 OF 1

DATE STARTED: 4/2/2021
DATE FINISHED: 4/2/2021

DEPTH OF WATER: Dry
LOCATION: See Plan

GROUND ELEVATION: N/A
GROUND WATER ELEV.: N/A

DRILLING TECHNIQUE: Mud Rotary
HAMMER TYPE: 140 lb. Automatic Trip Hammer, 30 Inch Drop

DEPTH FEET	SAMPLE DEPTH	SPT BLOW COUNTS (PER 6")	STRATA	DESCRIPTION OF SOIL
	S-1 0-2'	6 – 8 – 9 – 7		S-1 Light Brown CLAY & SILT , trace f Sand.
	S-2 2-4'	9 – 14 – 17 – 16		S-2 Red-Brown SILT & CLAY , some mf+ Sand, trace f Gravel.
--- 5' ---	S-3 4-6'	30 – 30 – 50/6" – X		S-3 Red-Brown CLAY & SILT , some mf Gravel, trace+ cmf Sand. (completely weathered Shale)
	S-4 6-8'	50/5" – X – X – X		S-4 Same as S-3 .
	S-5 8-10'	35 – 50/3" – X – X		S-5 Same as S-3 .
--- 10' ---	S-6 10-12'	50/5" – X – X – X		S-6 Same as S-3 .
--- 15' ---	S-7 15-17'	50/2" – X – X – X		S-7 No Recovery.
				END OF BORING AT 15.2'
--- 20' ---				
--- 25' ---				
--- 30' ---				
--- 35' ---				

SOILS ENGINEER: R. KNOTZ, PE
DRILLING INSPECTOR: M. MILGROM

CONTRACTOR: BORING BROTHERS
DRILLER: S. HEADLY

The information shown hereon indicates the subsurface conditions encountered at the specific boring location on the date(s) of drilling. Subsurface conditions are likely to vary across the project site. Interpretation of the subsurface data shall be at the discretion of the user.



TEST BORING LOG

ATRIUM DRIVE WAREHOUSE DEVELOPMENT
FRANKLIN TOWNSHIP, SOMERSET COUNTY, NEW JERSEY
(FPA PROJECT NO. 17038.001)

BORING NO.: B-20
SHEET: 1 OF 1

DATE STARTED: 4/2/2021
DATE FINISHED: 4/2/2021

DEPTH OF WATER: Dry
LOCATION: See Plan

GROUND ELEVATION: N/A
GROUND WATER ELEV.: N/A

DRILLING TECHNIQUE: Mud Rotary
HAMMER TYPE: 140 lb. Automatic Trip Hammer, 30 Inch Drop

DEPTH FEET	SAMPLE DEPTH	SPT BLOW COUNTS (PER 6")	STRATA	DESCRIPTION OF SOIL
	S-1 0-2'	2 - 4 - 3 - 3		S-1 Brown CLAY & SILT , trace ⁺ mf Sand.
	S-2 2-4'	5 - 10 - 14 - 30		S-2 Red-Brown SILT & CLAY , little cmf Sand, trace ⁺ f Gravel.
--- 5' ---	S-3 4-6'	50/3" - X - X - X		S-3 Red-Brown CLAY & SILT , little ⁺ mf Sand, trace ⁺ mf ⁺ Gravel. (completely weathered Shale)
	S-4 6-8'	36 - 50/4" - X - X		S-4 Same as S-3 .
--- 10' ---	S-5 8-10'	44 - 50/4" - X - X		S-5 Red-Brown SILT & CLAY , little cmf ⁺ Gravel, trace f Sand. (completely weathered Shale)
	S-6 10-12'	70 - 50/1" - X - X		S-6 Same as S-5 .
--- 15' ---	S-7 15-17'	50/3" - X - X - X		S-7 Red-Brown SILT & CLAY , some ⁻ cmf Gravel, trace ⁺ cmf ⁺ Sand. (highly weathered Shale)
--- 20' ---				END OF BORING AT 15.3'
--- 25' ---				
--- 30' ---				
--- 35' ---				

SOILS ENGINEER: R. KNOTZ, PE
DRILLING INSPECTOR: M. MILGROM

CONTRACTOR: BORING BROTHERS
DRILLER: S. HEADLY

The information shown hereon indicates the subsurface conditions encountered at the specific boring location on the date(s) of drilling. Subsurface conditions are likely to vary across the project site. Interpretation of the subsurface data shall be at the discretion of the user.



TEST BORING LOG

**ATRIUM DRIVE WAREHOUSE DEVELOPMENT
FRANKLIN TOWNSHIP, SOMERSET COUNTY, NEW JERSEY
(FPA PROJECT NO. 17038.001)**

BORING NO.: B-21
SHEET: 1 OF 1

DATE STARTED: 4/2/2021
DATE FINISHED: 4/2/2021

DEPTH OF WATER: Dry
LOCATION: See Plan

GROUND ELEVATION: N/A
GROUND WATER ELEV.: N/A

DRILLING TECHNIQUE: Mud Rotary
HAMMER TYPE: 140 lb. Automatic Trip Hammer, 30 Inch Drop

DEPTH FEET	SAMPLE DEPTH	SPT BLOW COUNTS (PER 6")	STRATA	DESCRIPTION OF SOIL
--- 5' ---	S-1 0-2'	1 - 4 - 11 - 12		S-1 Red-Brown SILT & CLAY , and mf ⁺ Sand, trace ⁺ mf ⁺ Gravel. (completely weathered Shale)
	S-2 2-4'	35 - 103 - 50/1" - X		S-2 Same as S-1 .
	S-3 5-7'	50/1" - X - X - X		S-3 Red-Brown CLAY & SILT , some cmf Gravel, trace ⁺ cmf ⁺ Sand. (highly weathered Shale)
--- 10' ---				END OF BORING AT 5.1'
--- 15' ---				
--- 20' ---				
--- 25' ---				
--- 30' ---				
--- 35' ---				

SOILS ENGINEER: R. KNOTZ, PE **CONTRACTOR:** BORING BROTHERS
DRILLING INSPECTOR: M. MILGROM **DRILLER:** S. HEADLY

The information shown hereon indicates the subsurface conditions encountered at the specific boring location on the date(s) of drilling. Subsurface conditions are likely to vary across the project site. Interpretation of the subsurface data shall be at the discretion of the user.



TEST BORING LOG

**ATRIUM DRIVE WAREHOUSE DEVELOPMENT
FRANKLIN TOWNSHIP, SOMERSET COUNTY, NEW JERSEY
(FPA PROJECT NO. 17038.001)**

BORING NO.: B-22
SHEET: 1 OF 1

DATE STARTED: 4/2/2021
DATE FINISHED: 4/2/2021

DEPTH OF WATER: Dry
LOCATION: See Plan

GROUND ELEVATION: N/A
GROUND WATER ELEV.: N/A

DRILLING TECHNIQUE: Mud Rotary
HAMMER TYPE: 140 lb. Automatic Trip Hammer, 30 Inch Drop

DEPTH FEET	SAMPLE DEPTH	SPT BLOW COUNTS (PER 6")	STRATA	DESCRIPTION OF SOIL
	S-1 0-2'	8 – 10 – 5 – 5		S-1 Red-Brown SILT & CLAY , little ⁻ mf Sand.
	S-2 2-4'	3 – 5 – 8 – 8		S-2 Brown CLAY & SILT , trace ⁺ f Sand.
--- 5' ---	S-3 4-6'	49 – 66 – 50/2" – X		S-3 Red-Brown SILT & CLAY , some ⁻ mf Sand, trace ⁺ f Gravel. (completely weathered Shale)
	S-4 6-8'	50 – 50/3" – X – X		S-4 Brown & Red-Brown CLAY & SILT , little ⁺ cmf ⁺ Gravel, little ⁻ cmf ⁺ Sand. (completely weathered Shale)
--- 10' ---	S-5 8-10'	50/4" – X – X – X		S-5 Same as S-4 .
	S-6 10-12'	32 – 50/5" – X – X		S-6 Same as S-4 .
--- 15' ---	S-7 15-17'	50/2" – X – X – X		S-7 Red-Brown SILT & CLAY , some ⁺ cmf Gravel, trace f Sand. (highly weathered Shale)
--- 20' ---				END OF BORING AT 15.2'
--- 25' ---				
--- 30' ---				
--- 35' ---				

SOILS ENGINEER: R. KNOTZ, PE
DRILLING INSPECTOR: M. MILGROM

CONTRACTOR: BORING BROTHERS
DRILLER: S. HEADLY

The information shown hereon indicates the subsurface conditions encountered at the specific boring location on the date(s) of drilling. Subsurface conditions are likely to vary across the project site. Interpretation of the subsurface data shall be at the discretion of the user.



TEST BORING LOG

**ATRIUM DRIVE WAREHOUSE DEVELOPMENT
FRANKLIN TOWNSHIP, SOMERSET COUNTY, NEW JERSEY
(FPA PROJECT NO. 17038.001)**

BORING NO.: B-23
SHEET: 1 OF 1

DATE STARTED: 4/2/2021
DATE FINISHED: 4/2/2021

DEPTH OF WATER: Dry
LOCATION: See Plan

GROUND ELEVATION: N/A
GROUND WATER ELEV.: N/A

DRILLING TECHNIQUE: Mud Rotary
HAMMER TYPE: 140 lb. Automatic Trip Hammer, 30 Inch Drop

DEPTH FEET	SAMPLE DEPTH	SPT BLOW COUNTS (PER 6")	STRATA	DESCRIPTION OF SOIL
	S-1 0-2'	2 - 5 - 5 - 5		S-1 Red-Brown SILT & CLAY , little ⁻ mf Sand.
	S-2 2-4'	12 - 15 - 31 - 30		S-2 Red-Brown CLAY & SILT , little ⁺ cmf ⁺ Sand, little ⁻ mf Gravel.
--- 5' ---	S-3 4-6'	30 - 66 - 50/3" - X		S-3 Same as S-2 .
	S-4 6-8'	50/4" - X - X - X		S-4 Red-Brown CLAY & SILT , some ⁻ cmf Gravel, little ⁻ cmf ⁺ Sand. (completely weathered Shale)
--- 10' ---	S-5 8-10'	32 - 27 - 45 - 50/4"		S-5 Brown SILT & CLAY , little mf Gravel, trace ⁺ cmf Sand. (completely weathered Shale)
	S-6 10-12'	81 - 100/5" - X - X		S-6 Red-Brown CLAY & SILT , some ⁺ cmf ^f Gravel, trace cmf Sand. (completely weathered Shale)
--- 15' ---	S-7 15-17'	35 - 75/5" - X - X		S-7 Same as S-6 .
--- 20' ---				END OF BORING AT 15.9'
--- 25' ---				
--- 30' ---				
--- 35' ---				

SOILS ENGINEER: R. KNOTZ, PE
DRILLING INSPECTOR: M. MILGROM

CONTRACTOR: BORING BROTHERS
DRILLER: S. HEADLY

The information shown hereon indicates the subsurface conditions encountered at the specific boring location on the date(s) of drilling. Subsurface conditions are likely to vary across the project site. Interpretation of the subsurface data shall be at the discretion of the user.



Appendix B **Test Pit Logs**

BURMISTER SOIL CLASSIFICATION SYSTEM

A. Cohesionless Soils: Particle Size Definitions

Soil	Fraction	U.S. Standard Sieve	Actual Sizes
Gravel	coarse	3 in. to 1 in.	76 mm to 25 mm
	medium	1 in. to 3/8 in.	25 mm to 9.5 mm
	fine	3/8 in. to No. 10	9.5 mm to 2.0 mm
Sand	coarse	No. 10 to No. 30	2.0 mm to 0.6 mm
	medium	No. 30 to No. 60	0.6 mm to 0.25 mm
	fine	No. 60 to No. 200	0.25 mm to 0.075 mm
Silt		< No. 200	< 0.075 mm

B. Terms Describing Gradation of Cohesionless Soils

Written Description	Symbol/Designation	Defining Proportions
coarse, medium to fine	cmf	all fractions > 10%
coarse to medium	cm	< 10% fine
medium to fine	mf	< 10% coarse
coarse	c	< 10% medium and fine
medium	m	< 10% coarse and fine
fine	f	< 10% coarse and medium

Note: Use (+) for upper limit and (-) for lower limit.

C. Cohesive Soils: Terms Describing Plasticity

Soil	Plasticity Index	Workability	Plasticity Description
SILT	0	--	Non-Plastic
Clayey SILT	1 to 5	1/4 in. thread	Slightly Plastic
SILT & CLAY	5 to 10	1/8 in. thread	Low Plasticity
CLAY & SILT	10 to 20	1/16 in. thread	Medium Plasticity
Silty CLAY	20 to 40	1/32 in. thread	High Plasticity
CLAY	>40	1/64 in. thread	Very High Plasticity

D. Terms Describing Overall Composition of Soil

Written Proportion	Proportion Symbol	Proportion Percent by Weight
and	a	35 to 50
some	s	20 to 35
little	l	10 to 20
trace	t	1 to 10

Note: Use (+) for upper limit and (-) for lower limit.



TEST PIT LOG

ATRIUM DRIVE WAREHOUSE DEVELOPMENT
FRANKLIN TOWNSHIP, SOMERSET COUNTY, NEW JERSEY (FPA JOB NO. 17038.001)

TEST PIT NO.: TP-1
DATE: 3/17/2023

GROUND ELEV.: +66.4'±
DEPTH OF WATER: Dry
GROUNDWATER ELEV.: N/A
DEPTH TO EST. SEASONAL HIGH WATER: N/A

DEPTH	DESCRIPTION
0 – 42"	Dark Brown Clayey SILT , little ⁺ f Gravel, little m ^f Sand.
42 – 60"	Reddish-Brown m ^f SAND , some ⁺ Silt, little ⁻ Gravel. (decomposed Shale, cobbles ≈ 20% by volume)

END OF TEST PIT AT @ 5'

NOTES:

SOILS ENGINEER: R. Knotz, PE

CONTRACTOR: Renova Construction

TEST PIT OBSERVER: M. Milgrom

EXCAVATOR: Linkbelt 80

The information shown hereon indicates the subsurface conditions encountered at the specified test pit location on the date(s) of excavation. Subsurface conditions are likely to vary across the project site. Interpretation of the subsurface data shall be at the discretion of the user.



TEST PIT LOG

ATRIUM DRIVE WAREHOUSE DEVELOPMENT
FRANKLIN TOWNSHIP, SOMERSET COUNTY, NEW JERSEY (FPA JOB NO. 17038.001)

TEST PIT NO.: TP-2
DATE: 3/17/2023

GROUND ELEV.: +64.4'±
DEPTH OF WATER: 48"
GROUNDWATER ELEV.: +60.4'±
DEPTH TO EST. SEASONAL HIGH WATER: 48"

DEPTH	DESCRIPTION
0 – 19"	Dark Brown Clayey SILT , little f Sand. (w/ roots)
6 – 36"	Red-Brown Clayey SILT , and f Gravel, little mf Sand. (cobbles ≈ 5% by volume)
36 – 60"	Red-Brown Clayey SILT , some mf Sand, some cmf Gravel. (decomposed Shale, cobbles ≈ 30% by volume)

END OF TEST PIT AT @ 5'

NOTES:

SOILS ENGINEER: R. Knotz, PE

CONTRACTOR: Renova Construction

TEST PIT OBSERVER: M. Milgrom

EXCAVATOR: Linkbelt 80

The information shown hereon indicates the subsurface conditions encountered at the specified test pit location on the date(s) of excavation. Subsurface conditions are likely to vary across the project site. Interpretation of the subsurface data shall be at the discretion of the user.



TEST PIT LOG

ATRIUM DRIVE WAREHOUSE DEVELOPMENT
FRANKLIN TOWNSHIP, SOMERSET COUNTY, NEW JERSEY (FPA JOB NO. 17038.001)

TEST PIT NO.: TP-3
DATE: 3/17/2023

GROUND ELEV.: +64.8'±
DEPTH OF WATER: 54"
GROUNDWATER ELEV.: +60.3'±
DEPTH TO EST. SEASONAL HIGH WATER: 54"

DEPTH	DESCRIPTION
0 – 18"	Brown Clayey Silt , little mf+ Sand.
18 – 36"	Reddish-Brown Clayey SILT , some mf+ Sand, little+ mf Gravel.
36 – 60"	Red-Brown cmf GRAVEL , some+ Clayey Silt, little+ mf Sand. (decomposed Shale; cobbles ≈ 30% by volume)

END OF TEST PIT AT @ 5'

NOTES:

SOILS ENGINEER: R. Knotz, PE

CONTRACTOR: Renova Construction

TEST PIT OBSERVER: M. Milgrom

EXCAVATOR: Linkbelt 80

The information shown hereon indicates the subsurface conditions encountered at the specified test pit location on the date(s) of excavation. Subsurface conditions are likely to vary across the project site. Interpretation of the subsurface data shall be at the discretion of the user.



TEST PIT LOG

ATRIUM DRIVE WAREHOUSE DEVELOPMENT
FRANKLIN TOWNSHIP, SOMERSET COUNTY, NEW JERSEY (FPA JOB NO. 17038.001)

TEST PIT NO.: TP-4
DATE: 3/17/2023

GROUND ELEV.: +63.8'±
DEPTH OF WATER: Dry
GROUNDWATER ELEV.: NA
DEPTH TO EST. SEASONAL HIGH WATER: NA

DEPTH	DESCRIPTION
0 – 12"	Brown Clayey SILT , little mf ⁺ Sand.
12 – 24"	Red-Brown Clayey SILT , and f Gravel, little mf ⁺ sand. (decomposed Shale; cobbles ≈ 10% by volume)
24 – 60"	Red-Brown cmf SAND , some Clayey Silt, little mf Sand. (decomposed Shale, cobbles ≈ 25% by volume)

END OF TEST PIT AT @ 5'

NOTES: Difficult excavation after 2'.

SOILS ENGINEER: R. Knotz, PE

CONTRACTOR: Renova Construction

TEST PIT OBSERVER: M. Milgrom

EXCAVATOR: Linkbelt 80

The information shown hereon indicates the subsurface conditions encountered at the specified test pit location on the date(s) of excavation. Subsurface conditions are likely to vary across the project site. Interpretation of the subsurface data shall be at the discretion of the user.



TEST PIT LOG

ATRIUM DRIVE WAREHOUSE DEVELOPMENT
FRANKLIN TOWNSHIP, SOMERSET COUNTY, NEW JERSEY (FPA JOB NO. 17038.001)

TEST PIT NO.: TP-5
DATE: 3/17/2023

GROUND ELEV.: +63.4'±
DEPTH OF WATER: Dry
GROUNDWATER ELEV.: N/A
DEPTH TO EST. SEASONAL HIGH WATER: N/A

DEPTH	DESCRIPTION
0 – 24"	Red-Brown Clayey SILT , some ⁺ f Gravel, little mf Sand.
24 – 60"	Red-Brown cmf GRAVEL , some ⁺ Clayey Silt, little ⁺ mf Sand. (decomposed Shale; cobbles ≈ 25% by volume)

END OF TEST PIT AT @ 5'

NOTES:

SOILS ENGINEER: R. Knotz, PE

CONTRACTOR: Renova Construction

TEST PIT OBSERVER: M. Milgrom

EXCAVATOR: Linkbelt 80

The information shown hereon indicates the subsurface conditions encountered at the specified test pit location on the date(s) of excavation. Subsurface conditions are likely to vary across the project site. Interpretation of the subsurface data shall be at the discretion of the user.



TEST PIT LOG

ATRIUM DRIVE WAREHOUSE DEVELOPMENT
FRANKLIN TOWNSHIP, SOMERSET COUNTY, NEW JERSEY (FPA JOB NO. 17038.001)

TEST PIT NO.: TP-6
DATE: 3/17/2023

GROUND ELEV.: +64.3'±
DEPTH OF WATER: 90"
GROUNDWATER ELEV.: +56.8'±
DEPTH TO EST. SEASONAL HIGH WATER: 90"

DEPTH	DESCRIPTION
0 – 15"	Dark Brown CLAY & SILT , little f Sand. (w/ roots)
12 – 50"	Reddish-Brown SILT & CLAY , some ⁺ mf Gravel, little mf Sand.
50 – 90"	Red-Brown cmf GRAVEL , some ⁺ Clayey Silt, little mf Sand. (decomposed shale, cobbles ≈ 25% by volume)

END OF TEST PIT AT 7'6"

NOTES:

SOILS ENGINEER: R. Knotz, PE

CONTRACTOR: Renova Construction

TEST PIT OBSERVER: M. Milgrom

EXCAVATOR: Linkbelt 80

The information shown hereon indicates the subsurface conditions encountered at the specified test pit location on the date(s) of excavation. Subsurface conditions are likely to vary across the project site. Interpretation of the subsurface data shall be at the discretion of the user.



TEST PIT LOG

ATRIUM DRIVE WAREHOUSE DEVELOPMENT
FRANKLIN TOWNSHIP, SOMERSET COUNTY, NEW JERSEY (FPA JOB NO. 17038.001)

TEST PIT NO.: TP-7
DATE: 3/17/2023

GROUND ELEV.: +63.8'±
DEPTH OF WATER: 86"
GROUNDWATER ELEV.: +56.6'±
DEPTH TO EST. SEASONAL HIGH WATER: 86"

DEPTH	DESCRIPTION
0 – 20"	Dark Brown Clayey SILT , little mf Gravel, little mf Sand. (w/ roots)
20 – 50"	Reddish-Brown Clayey SILT , some ⁺ f Gravel, little mf Sand.
50 – 84"	Red-Brown Clayey SILT , and cmf Gravel, little mf Sand. (decomposed Shale, cobbles ≈ 25% by volume)

END OF TEST PIT AT @ 7'

NOTES:

SOILS ENGINEER: R. Knotz, PE

CONTRACTOR: Renova Construction

TEST PIT OBSERVER: M. Milgrom

EXCAVATOR: Linkbelt 80

The information shown hereon indicates the subsurface conditions encountered at the specified test pit location on the date(s) of excavation. Subsurface conditions are likely to vary across the project site. Interpretation of the subsurface data shall be at the discretion of the user.



TEST PIT LOG

ATRIUM DRIVE WAREHOUSE DEVELOPMENT
FRANKLIN TOWNSHIP, SOMERSET COUNTY, NEW JERSEY (FPA JOB NO. 17038.001)

TEST PIT NO.: TP-8
DATE: 3/20/2023

GROUND ELEV.: +60.5'±
DEPTH OF WATER: Dry
GROUNDWATER ELEV.: N/A
DEPTH TO EST. SEASONAL HIGH WATER: N/A

DEPTH	DESCRIPTION
0 – 16"	Reddish-Brown Clayey SILT , some c ⁺ mf Gravel, little ⁺ mf Sand.
16 – 40"	Brown Clayey SILT , little ⁺ mf Sand, little mf Gravel.
40 – 72"	Red-Brown cmf GRAVEL , some ⁺ Clayey Silt, little mf Sand. (decomposed Shale, cobbles ≈ 15% by volume)

END OF TEST PIT AT @ 9'

NOTES:

SOILS ENGINEER: R. Knotz, PE

CONTRACTOR: Renova Construction

TEST PIT OBSERVER: M. Milgrom

EXCAVATOR: Linkbelt 80

The information shown hereon indicates the subsurface conditions encountered at the specified test pit location on the date(s) of excavation. Subsurface conditions are likely to vary across the project site. Interpretation of the subsurface data shall be at the discretion of the user.



TEST PIT LOG

ATRIUM DRIVE WAREHOUSE DEVELOPMENT
FRANKLIN TOWNSHIP, SOMERSET COUNTY, NEW JERSEY (FPA JOB NO. 17038.001)

TEST PIT NO.: TP-9
DATE: 3/20/2023

GROUND ELEV.: +60.3'±
DEPTH OF WATER: Dry
GROUNDWATER ELEV.: N/A
DEPTH TO EST. SEASONAL HIGH WATER: N/A

DEPTH	DESCRIPTION
0 – 20"	Reddish-Brown Clayey SILT , some ⁺ cmf Gravel, trace mf Sand.
20 – 50"	Brown Clayey SILT , little ⁺ m ⁺ f Sand, little mf Gravel.
20 – 96"	Brown cmf GRAVEL , and Clayey Silt, little mf Sand. (cobbles ≈ 25% by volume)

END OF TEST PIT AT @ 8' (Refusal on Bedrock)

NOTES:

SOILS ENGINEER: R. Knotz, PE

CONTRACTOR: Renova Construction

TEST PIT OBSERVER: M. Milgrom

EXCAVATOR: Linkbelt 80

The information shown hereon indicates the subsurface conditions encountered at the specified test pit location on the date(s) of excavation. Subsurface conditions are likely to vary across the project site. Interpretation of the subsurface data shall be at the discretion of the user.



TEST PIT LOG

ATRIUM DRIVE WAREHOUSE DEVELOPMENT
FRANKLIN TOWNSHIP, SOMERSET COUNTY, NEW JERSEY (FPA JOB NO. 17038.001)

TEST PIT NO.: TP-10
DATE: 3/20/2023

GROUND ELEV.: +64.3'±
DEPTH OF WATER: Dry
GROUNDWATER ELEV.: N/A
DEPTH TO EST. SEASONAL HIGH WATER: N/A

DEPTH	DESCRIPTION
0 – 12"	Dark Brown SILT & CLAY , little cmf Gravel, little f Sand.
12 – 20"	Reddish-Brown Clayey SILT , little mf Sand.
20 – 60"	Red-Brown cmf GRAVEL some+ Clayey Silt, little mf Sand. (decomposed Shale, cobbles ≈ 25% by volume)

END OF TEST PIT AT @ 5'

NOTES:

SOILS ENGINEER: R. Knotz, PE

CONTRACTOR: Renova Construction

TEST PIT OBSERVER: M. Milgrom

EXCAVATOR: Linkbelt 80

The information shown hereon indicates the subsurface conditions encountered at the specified test pit location on the date(s) of excavation. Subsurface conditions are likely to vary across the project site. Interpretation of the subsurface data shall be at the discretion of the user.



TEST PIT LOG

ATRIUM DRIVE WAREHOUSE DEVELOPMENT
FRANKLIN TOWNSHIP, SOMERSET COUNTY, NEW JERSEY (FPA JOB NO. 17038.001)

TEST PIT NO.: TP-11
DATE: 3/20/2023

GROUND ELEV.: +63'±
DEPTH OF WATER: Dry
GROUNDWATER ELEV.: N/A
DEPTH TO EST. SEASONAL HIGH WATER: N/A

DEPTH	DESCRIPTION
0 – 10"	Dark Brown Clayey SILT , little+ Sand.
10 – 36"	Reddish-Brown SILT & CLAY , some+ f Gravel, little mf Sand.
36 – 60"	Red-Brown cmf GRAVEL , some+ Clayey Silt, little mf Sand. (decomposed Shale, cobbles ≈ 15% by volume)

END OF TEST PIT AT @ 5'

NOTES:

SOILS ENGINEER: R. Knotz, PE

CONTRACTOR: Renova Construction

TEST PIT OBSERVER: M. Milgrom

EXCAVATOR: Linkbelt 80

The information shown hereon indicates the subsurface conditions encountered at the specified test pit location on the date(s) of excavation. Subsurface conditions are likely to vary across the project site. Interpretation of the subsurface data shall be at the discretion of the user.



TEST PIT LOG

ATRIUM DRIVE WAREHOUSE DEVELOPMENT
FRANKLIN TOWNSHIP, SOMERSET COUNTY, NEW JERSEY (FPA JOB NO. 17038.001)

TEST PIT NO.: TP-12
DATE: 3/20/2023

GROUND ELEV.: +61.7'±
DEPTH OF WATER: Dry
GROUNDWATER ELEV.: N/A
DEPTH TO EST. SEASONAL HIGH WATER: N/A

DEPTH	DESCRIPTION
0 – 6"	Dark Brown CLAY & SILT , little mf Sand, little ⁺ mf Gravel.
6 – 16"	Reddish-Brown Clayey SILT , some ⁺ f Gravel, little mf Sand.
16 – 48"	Brown SILT & CLAY , little ⁺ f Gravel, little mf Gravel.
48 – 84"	Red-Brown cmf GRAVEL , some ⁺ Clayey Silt, little mf Sand. (decomposed Shale, cobbles ≈ 20% by volume)

END OF TEST PIT Ared-BT @ 7' (Refusal on Bedrock)

NOTES:

SOILS ENGINEER: R. Knotz, PE

CONTRACTOR: Renova Construction

TEST PIT OBSERVER: M. Milgrom

EXCAVATOR: Linkbelt 80

The information shown hereon indicates the subsurface conditions encountered at the specified test pit location on the date(s) of excavation. Subsurface conditions are likely to vary across the project site. Interpretation of the subsurface data shall be at the discretion of the user.



TEST PIT LOG

ATRIUM DRIVE WAREHOUSE DEVELOPMENT
FRANKLIN TOWNSHIP, SOMERSET COUNTY, NEW JERSEY (FPA JOB NO. 17038.001)

TEST PIT NO.: TP-13
DATE: 3/20/2023

GROUND ELEV.: +60.2'±
DEPTH OF WATER: Dry
GROUNDWATER ELEV.: N/A
DEPTH TO EST. SEASONAL HIGH WATER: N/A

DEPTH	DESCRIPTION
0 – 40"	Brown Clayey SILT , little mf Sand, trace mf Gravel.
40 – 84"	Red-Brown cmf GRAVEL , some Clayey Silt, little mf Sand. (decomposed Shale, cobbles ≈ 20% by volume)

END OF TEST PIT AT @ 7' (Refusal)

NOTES:

SOILS ENGINEER: R. Knotz, PE

CONTRACTOR: Renova Construction

TEST PIT OBSERVER: M. Milgrom

EXCAVATOR: Linkbelt 80

The information shown hereon indicates the subsurface conditions encountered at the specified test pit location on the date(s) of excavation. Subsurface conditions are likely to vary across the project site. Interpretation of the subsurface data shall be at the discretion of the user.



TEST PIT LOG

ATRIUM DRIVE WAREHOUSE DEVELOPMENT
FRANKLIN TOWNSHIP, SOMERSET COUNTY, NEW JERSEY (FPA JOB NO. 17038.001)

TEST PIT NO.: TP-14
DATE: 3/20/2023

GROUND ELEV.: +60.7'±
DEPTH OF WATER: Dry
GROUNDWATER ELEV.: N/A
DEPTH TO EST. SEASONAL HIGH WATER: N/A

DEPTH	DESCRIPTION
0 – 36"	Brown Clayey SILT , little+ mf Gravel, trace mf Sand.
36 – 60"	Brown cmf SAND , some mf Gravel, little+ Clayey Silt. (decomposed Shale, cobbles ≈ 5% by volume)
60 – 96"	Red-Brown cmf GRAVEL , some Clayey Silt, little+ mf Sand. (decomposed Shale, cobbles ≈ 25% by volume)

END OF TEST PIT AT @ 8'

NOTES:

SOILS ENGINEER: R. Knotz, PE

CONTRACTOR: Renova Construction

TEST PIT OBSERVER: M. Milgrom

EXCAVATOR: Linkbelt 80

The information shown hereon indicates the subsurface conditions encountered at the specified test pit location on the date(s) of excavation. Subsurface conditions are likely to vary across the project site. Interpretation of the subsurface data shall be at the discretion of the user.



Appendix C

Laboratory Testing



SUMMARY OF LABORATORY TESTING



PROJECT: Atrium Drive Warehouse Development

PROJECT #: 17038.001

DATE: 4/23

Boring & Sample Number	Depth (inches)	Classification	Natural Water Content %	Atterberg Limits		AASHTO T-290 Sulfate (ppm)	AASHTO T-291 Chloride (ppm)	Unit Dry Weight PCF	Specific Gravity	Permeability inches / hour @ 20 deg C	Compaction	Grain Size	Consolidation	Triaxial	% Passing #200	pH	Organic Content %
				Liquid Limit	Plastic Limit												
TP-1 S-1	19	Dark Brown Clayey SILT, little+ f Gravel, little mf+ Sand	23					78.6		0.14							
TP-2 S-1	34	Red-Brown Clayey SILT, and f Gravel, little mf Sand	15					109.1		1.1 X 10 ⁻³							
TP-3 S-1	24	Reddish-Brown Clayey SILT, some mf+ Sand, little+ mf Gravel	9					115.1		5.2 X 10 ⁻³							
TP-4 S-1	18	Red-Brown Clayey SILT, and- f Gravel, little mf+ sand	14					112.2		1.6 X 10 ⁻²							
TP-5 S-1	32	Red-Brown cmf GRAVEL, some+ Clayey Silt, little+ mf Sand	13					103.0		0.14							
TP-6 S-1	27	Reddish-Brown SILT & CLAY, some+ mf Gravel, little mf Sand	11					116.8		2.7 X 10 ⁻⁴							
TP-7 S-1	24	Reddish-Brown Clayey SILT, some+ f Gravel, little mf Sand	12					122.2		1.2 X 10 ⁻⁴							
TP-8 S-1	22	Brown Clayey SILT, little+ mf Sand, little mf Gravel	13					113.2		2.1 X 10 ⁻⁴							
TP-9 S-1	20	Brown Clayey SILT, little+ m+f Sand, little mf Gravel	14					107.7		9.0 X 10 ⁻⁴							
TP-11 S-1	14	Reddish-Brown SILT & CLAY, some+ f Gravel, little mf Sand	14					110.6		1.1 X 10 ⁻³							
TP-12 S-1	18	Brown SILT & CLAY, little+ f Gravel, little mf Gravel	19					104.5		8.4 X 10 ⁻⁴							
TP-13 S-1	14	Brown Clayey SILT, little mf Sand, trace mf Gravel	17					112.3		2.0 X 10 ⁻⁴							
TP-14 S-1	20	Brown Clayey SILT, little+ mf Gravel, trace mf Sand	13					119.8		3.6 X 10 ⁻⁵							

* SEE TEST CURVES

Supervising Professional Engineer: Michael W. Schappert, PE