



4405 South Clinton Avenue, Suite-A

South Plainfield, NJ 07080-1213

Tel. (844) 287-5958

Fax (908) 754-1359

E-mail: ansgeoinc@yahoo.com

Soil Boring, Environmental Services, Applied Soil Mechanics & Laboratory Testing, Soil Boring, Environmental Services, Applied Soil Mechanics & Laboratory Testing

November 20, 2020

The Nader Group, LLC
111 Mill Street
Hackettstown, NJ 07840

Attn.: Mr. Paul A. Couvrette, PE, CME
Director of Civil Engineering

Re: **Subsurface Soil Investigation & Foundation Recommendation Report**
Proposed New Building near the existing building
Byram Municipal Building
10 Mansfield Drive
Stanhope, NJ

Dear Mr. Couvrette:

Enclosed, please find three (3) copies of the Subsurface Soil Investigation & Foundation Recommendation Report for the total of three (3) Soil Borings performed on October 30, 2020 at the project referenced above.

Soil Samples collected during soil boring program will be discarded after thirty (30) days from the date of this report, if not requested in advance to do otherwise. We thank you very much for providing us an opportunity to service you on this project.

Should you have any questions or require additional information, please do not hesitate to contact the undersigned at (908)754-8383.

Sincerely,
ANS Geo, Inc.

A handwritten signature in blue ink, appearing to read 'Atul N. Shah', is written over a horizontal blue line.

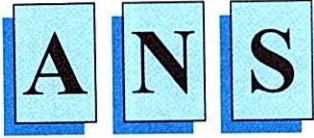
Atul N. Shah, PE
President
NJ PE License #24GE03443900
ANS/RM

Reported: The Nader Group, LLC – (3); File – (1)

File: GEO-269_01.SB

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Dear Mr. Couvrette:

Enclosed, please find three (3) copies of the Subsurface Soil Investigation & Foundation Recommendation Report for the total of three (3) Soil Borings performed on October 30, 2020 at the project referenced above. The soil boring work was performed in accordance with our signed proposal dated October 02, 2020.

Our **Scope of Services** included the following:

1. Drilling and fulltime inspection of total of three (3) soil borings, down to maximum 27'-0" depth or to refusal, including recording of groundwater level, if encountered in the contracted depth.
2. Performance of engineering evaluation to determine the stratification and physical properties of the subsurface materials.
3. Preparation of a written report summarizing all findings and recommendations.

PROPOSED CONSTRUCTION:

The project site is located at 10 Mansfield drive, Stanhope, New Jersey in Sussex County. At the present time, the subject property consists of a Municipal Building, Court and a Police Station. We understand that the new building is proposed at the subject site near the existing building. Since, detailed construction drawings were not provided, our recommendations are based upon IBC-2018- ASCE 7-16 and construction material loads for the Building Construction based upon American National Standards. Please see soil boring location plan in Appendix-A for the exact location of the soil borings and photographs in Appendix-C for the existing site conditions.

SITE CONDITIONS:

The subject site is located towards southside of Mansfield Drive. The site was noted to be fairly level during soil boring activities. The subject site is primarily surrounded by commercial properties. It is at Latitude N 40° 56' 11.51", Longitude W 74° 42' 23.98" on the USGS Digital

Elevation Model. It is at an approximate elevation of 716' above mean sea level. See the site location plan in Appendix-A for more details.

FIELD INVESTIGATION

The soil boring locations were selected and marked by an ANS field representative based upon the equipment access. Surface utility mark-out was performed by New Jersey One-Call System. Once, cleared the soil boring work began on October 30, 2020.

A total of three (3) soil borings, B-1 to B-3 were drilled during the geo-technical investigation at the site on October 30, 2020. All the soil boring locations are shown in the Soil Boring Location Plan which is included in Appendix-A. Soil boring work was performed under the direction and supervision of field Engineer Mr. Syed Abbas. The borings were drilled using a 3" diameter hollow stem auger. Soil encountered was sampled continuously down to a depth of 12'-0" and then at a distance of 5'-0" intervals down to augur refusal noted between 14.75 feet to 19.16 feet depth in all the borings B-1 to B-3. Soil samples were extracted using a 2" diameter split spoon sampler as per the procedure specified in ASTM 1586-99.

Samples for both the borings were obtained by the Standard Penetration Test (SPT) Method (ASTM D 1586), which consists of driving a 2-inch outside-diameter split-spoon sampler into the soil with a 140-pound weight falling freely from a distance of 30 inches. The samplers were driven in four successive 6-inch increments, with the number of blows per increment being recorded. The number of blows required to advance the sampler in the middle 12 inches is termed as the Standard Penetration Resistance (N-value) and is presented on the Field Test Boring Logs in Appendix-A.

During drilling operations, extracted soil samples were visually examined and classified by our Field Engineer. The soil sample description, Standard penetration test (SPT) blow counts and locations, strata changes, groundwater depth and other pertinent information were recorded on a detailed field log. Soil samples obtained from the split spoon sampler were visually classified according to the Unified Soil Classification System (USCS). Samples were later returned to our laboratory for further review and testing.

LABORATORY TESTING:

A total of three (3) soil samples, one each from borings B-1 to B-3 were laboratory tested to determine in-place moisture content and to classify the soil as per Unified Soil Classification System, ASTM-D2487-93. The findings are summarized below. Laboratory test reports are enclosed in Appendix -B.

Soil Boring Number	Soil Sample Number	Depth Sample collected	% Moisture Content	Fines thru #200 Sieve	USCS Classification Symbol
B-1	S-1	4'- 6'	11.3	14.0	SM
B-2	S-2	6'- 8'	12.9	13.6	SM
B-3	S-3	8'- 10'	12.5	11.2	SP-SM

SM: silty sands SP-SM: A mixture of Poorly graded Sands and Silty Sands

SUBSURFACE CONDITIONS:

Detailed description of the soil encountered in the test boring is documented in the boring log which is presented in Appendix-A. The following gives a general description of the subsurface conditions encountered at the borings. While the borings may indicate that the

subsurface conditions appear to be relatively uniform across the site, it should be recognized that the size of borings were small compared to the size of the site, and that the existence of anomalies cannot be precluded.

According to NJ Geoweb website, the geological formation is Late Wisconsinan Glaciofluvial Deposits and geologic age is late Pleistocene, late Wisconsinan. It consists of Sand and pebble-to-cobble gravel, minor silt; yellowish brown to reddish brown. As much as 50 feet thick.

Based on the results of soil borings and our geo-technical laboratory testing, we estimate the general stratigraphy of the site to consist of the following major units, in an increasing order of depth.

Stratum-1: Fill material containing DGA and Asphalt- Gray & Black f/c sand, trace silt, some f/c gray crushed stones was noted under this stratum in top 5 inches in boring B-1 & B-2 and in top 9 inches in boring B-3. The relative density of this material was noted to be in medium dense condition.

Stratum-2: Greenish orange/dark brown & orange clayey silt, trace f/c sand, trace f/c gravel was noted between 2 feet to 4 feet in boring B-1, down to 4 feet in B-2. This stratum was not noted in B-3. The relative stiffness of this material varies from soft to medium stiff condition.

Stratum-3: Greenish orange f/c sand and f/c gravel, trace silt was noted under this stratum between 4 feet to 8 feet depth in boring B-1, between 8 feet to 10 feet in B-2. The relative density of this material was noted to be in medium dense condition.

Stratum-4: Greenish/grayish orange f/c sand, trace silt, some f/c gravel was noted under this stratum between 8 feet to 10 feet in boring B-1, between 6 feet to 8 feet in B-2, between 8 feet to 12 feet in B-3. The relative density of this material was noted to be in loose condition.

Stratum-5: Augur Refusal indicating possible bedrock was encountered at 14.75 feet in B-1, at 19.16 feet in B-2 and at 15 feet in B-3.

SUMMARY OF FINDINGS:

Boring Number	Depth in feet	Penetration Resistance N-Value	Soil Type	In-Place Soil Bearing Capacity (PSF)	Recommended Safe Bearing Capacity (PSF)
B-1	0 – 2	14	FILL/SM-ML	2800	2000
B-1	2 – 4	8	CL-ML	1600	2000
B-1	4 – 6	19	SP/GP	3800	3500
B-1	6 – 8	21	SP/GP	4200	3500
B-1	8 – 10	15	SP-SM	3000	3500
B-1	10 – 12	16	ML	3200	3500
B-1	@ 14'-9"	Augur Refusal	-	+5000	5000

Boring Number	Depth in feet	Penetration Resistance N-Value	Soil Type	In-Place Soil Bearing Capacity (PSF)	Recommended Safe Bearing Capacity (PSF)
B-2	0 – 2	23	FILL/CL-ML	4600	2000
B-2	2 – 4	6	CL-ML	1200	1500
B-2	4 – 6	15	CL-ML	3000	3000
B-2	6 – 8	15	SP-SM	3000	3000

B-2	8 – 10	13	SP/GP	2600	2500
B-2	10 – 12	6	ML	1200	1500
B-2	15 – 17	8	ML	1600	2000
B-2	@ 19'-2"	Augur Refusal	-	+5000	5000

Boring Number	Depth in feet	Penetration Resistance N-Value	Soil Type	In-Place Soil Bearing Capacity (PSF)	Recommended Safe Bearing Capacity (PSF)
B-3	0 – 2	13	FILL	2600	2000
B-3	2 – 4	16	SP-SC	3200	3000
B-3	4 – 6	15	SC	3000	3000
B-3	6 – 8	14	SM-ML	2800	3000
B-3	8 – 10	16	SP-SM	3200	3000
B-3	10 – 12	28	SP-SM	+5000	4500
B-3	@ 15'-0"	Augur Refusal	-	+5000	5000

GROUNDWATER:-

Groundwater was not encountered in any of the borings B-1 to B-3. However, perched water was noted between 6 inches to 1'-2" depth in all the three borings. It should be noted that groundwater level will fluctuate due to variations in rainfall or other factors not evident at the time of our investigation.

CONCLUSIONS:

- Groundwater was not encountered in any of the borings B-1 to B-3. However, perched water was noted between 6 inches to 1'-2" depth in all the three borings. Consequently, we anticipate that some groundwater management during construction will be required.
- Fill was noted in top 5 inches to 9 inches in all the borings B-1 to B-3. The on-site soils consist of silty sands. On-site soil will be suitable as structural fill. Depending upon the time of the year when the actual construction takes place, drying of excavated soil and aeration may be required to reduce the moisture content. In-situ moisture content of soil varies in between 11.3% to 12.9% which is generally considered moist.
- The following parameters should be used for seismic design of the building in accordance with IBC-2018- ASCE 7-16:

Description	Parameter	Recommended value
Mapped Spectral Acceleration for short periods:	S _s	0.233
Mapped Spectral Acceleration for 1-sec period:	S ₁	0.055
Site Class:	C	Medium Dense Soil
Site Coefficient:	F _a	1.3
Site Coefficient :	F _v	1.5
5 percent damped Design spectral response acceleration at short periods:	S _{DS}	0.202
5 percent damped Design spectral response acceleration at 1-sec periods:	S _{D1}	0.055

- Any fill used as backfill material within the building and pavement areas should consist of approved portions of the on-site granular soils, which have been maintained at moisture contents suitable for compaction or select fill should be imported. All fill should be placed in

lift in the order of twelve (12) inches in loose thickness and be uniformly compacted to at least 95% of its maximum dry density as determined by the modified proctor density values derived based upon ASTM D-1557-98 test procedure.

In addition, we recommend that backfill soil placed in confined areas, such as foundation or utility excavations, should be spread in lifts in the order of six (6) to eight (8) inches in loose thickness and it should be compacted to the same degree using manually operated vibratory compaction equipment. We recommend that temporary construction slopes be established at one vertical to two horizontal, or flatter, or as required by the governing safety codes.

FOUNDATION DESIGN CRITERIA:

We recommend that the foundation for the proposed new building near the existing building may be supported by conventional shallow foundations established on the medium dense soil at 4'-0" feet depth below grade. Foundation should be designed to impose maximum allowable net bearing pressure of up to 3,000 pounds per square foot. A complete removal of fill is recommended.

Any pockets of localized unsuitable soil encountered during foundation excavation should be completely removed. The over excavated area should be backfilled utilizing either controlled compacted fill or 3/4" size clean gravels. Any footing or slab placed in this area will require over excavation, removal of unsuitable material and backfilling with 3/4 size stones or controlled compacted fill. Placing additional reinforcing steel to strength the footing over soft soil may be required.

We recommend that exterior foundations be established at least three feet six inches below the adjacent exterior grade, or as required by local ordinance, to provide protection from frost penetration. The maximum post-construction settlements of foundations designed and constructed in accordance with our recommendations will be in the order of 3/4" or less.

FLOOR SLAB DESIGN CRITERIA:

Removal of fill from top 5 inches to 9 inches from all the borings is required. The floor slab may be supported directly on the compacted sub-grade of onsite material or controlled compacted structural fill. Compaction of the sand below the floor slab sub-grade to 95% of its optimum density will be required. We recommend performing compaction test at the rate of one test per 200-sq.ft area. Recommended Modulus of Sub-Grade reaction is 100 pci.

To minimize dampness, we recommend that the floor should be underlain by a six (6) mil polyethylene moisture barrier and six (6) inch thick layer of clean 3/4 inch crushed stone to provide a stable working area during construction and serve as a capillary break between the base of the slab and the underlying silty sub-grade soils.

Any back fill required for the structural area to be off site or 3/4" clean crushed stones may be utilized to minimize the influence of moisture on the first fill layer. All off-site fill should composed of relatively well graded sand and gravel containing less than 15% by weight passing U.S. Standard #200 sieve and having a maximum particle size of six inches. Acceptable soil materials for backfill and fill should be free of clay, rock or gravel larger than six (6) inches in any dimension, debris, waste, frozen materials, vegetable and other deleterious matter and it should comply with ASTM D-2487-91 soil classification groups GW, GP, SM, SW and SP.

All fill should be placed in lifts in the order of twelve (12) inches in loose thickness and it should be uniformly compacted to at least 95% of its maximum dry density as determined by the modified proctor density values derived based upon ASTM D-1557-93 test procedure. In addition, we recommend that backfill soils placed in confined areas, such as foundation or utility excavations, should be spread in lifts in the order of six to eight inches in loose thickness and be compacted to the same degree using manually operated vibratory compaction equipment.

BELOW GRADE WALLS:

We recommend that the exterior building walls should be constructed with a continuous perimeter foundation drain to convey localized groundwater seepage away from the building and prevent the hydrostatic pressures built-up against the walls. The drain could consist of a 6 to 8 inch diameter PVC pipe surrounded on all sides by a minimum of six (6) inches of clean 3/8" crushed gravel. The pipe should drain by gravity to the site storm water system, if feasible, or should be connected to a sump pit where any water could be removed by pumping.

Soil Unit weight (total):	120 pcf
Angle of Internal Friction:	31 degrees
Coefficient of sliding friction:	0.4
Coefficient of active earth pressure:	0.28
Coefficient of passive earth pressure:	3.57

RECOMMENDATIONS FOR THE EARTHWORK FOUNDATION CONSTRUCTION:

Clearing and Stripping: Clearing and stripping would include removing vegetation and any boulders or any loose or unsuitable soil at the distance of 5 feet beyond the limits of the proposed building excavation, structure and paved areas. Limits of stripping should conform to construction permit limitations.

Soil Erosion and Sediment Control: Clearing and stripping should be performed in accordance with the requirements of the soil erosion and sediment control plan and environment permits.

Drainage and Dewatering: Site runoff during construction should be controlled in accordance with the soil erosion and sediment control plan. Interim grading during earthwork should be planned to prevent ponding of water in the prepared subgrade.

Protection of Utilities: Existing utilities, in the area of construction should be marked to protect from damage during excavation and foundation construction. Excavations should be stopped if they could potentially undermine existing utilities.

Excavation & side slope: An unbraced excavation slope of 2.0 horizontal to 1 vertical or flatter may be considered in the planning for construction. Sheeting and bracing, and or slope stabilization systems should be used wherever the unbraced slope pass beneath utilities or structures, the active roadway arrears and/or where it is found to be necessary or more cost effective to use sheeting in order to limit the size of the excavations and maintain traffic. Sheeting and bracing systems and excavation slopes may be designed using the soil properties presented in summary table provided earlier.

Proof rolling and compaction of Pavement and Fill Subgrades: Following stripping or excavation to plan elevations, all subgrades for placement of new foundation or parking lot pavement should be proof rolled using a vibratory roller with minimum 1 ton static weight in confined areas along side walls and 10 tons static weight in the footprint of the building and general roadway paved areas. Footing subgrades should be compacted with small area vibratory plate compactors. Proof rolling should be observed and evaluated by a qualified Geotechnical engineer or technician familiar with site conditions.

MINIMUM PAVEMENT DESIGN SECTIONS:

ACCESS ROAD AND TRUCK TRAFFIC AREAS

Bituminous Concrete Surface Course	2 inches
Bituminous Concrete Base Course	4 inches
Quarry Process Base Course (NJ DOT DGA)	<u>5 inches</u>
TOTAL SECTION THICKNESS	11 inches

AUTOMOBILE PARKING AREAS

Bituminous Concrete Surface Course	2 inches
Bituminous Concrete Base Course	3 inches
Quarry Process Base Course (NJ DOT DGA)	<u>3 inches</u>
TOTAL SECTION THICKNESS	8 inches

As previously discussed, it is recommended that the loose soils at the surface should be proof rolled and densified with a heavy vibratory compactor. With this recommended compaction, a CBR value of six (6) would be appropriate for use in the design of flexible pavements over site soils with imported granular fill, the CBR could be about eight (8).

RECOMMENDED SERVICES:

It is recommended that we should be retained to provide continuous observation and Soil engineering services during the excavation and foundation construction phases of the work. This is to observe compliance with the design concepts, specifications and recommendations, and to allow design charges in the event that subsurface conditions differ from those anticipated prior to start of construction.


LIMITATIONS:

The recommendations contained in this report are our best professional judgment as to be followed in the design and construction of the proposed project. There may be subsurface conditions not disclosed by the explorations adequately identify subsurface conditions for the purpose of this study. If during construction any differences are found between the report of the explorations and the actual subsurface conditions, they should be brought to our attention immediately so that the effect in our recommendations can be evaluated.

This report has been prepared in accordance with generally accepted Geo-technical Engineering practices for the exclusive use of our client The Nader Group LLC and their designated representative(s). No other warranty, express or implied is made. Contractor's wishes to use the soil boring information may do at their own risk. Unless specifically indicated to the contrary in this report, this report does not address environmental considerations, which may affect the site development. The conclusions and recommendations of this report are not intended to supersede or overlook any N.J.D.E.P. Environmental conditions, which should be reflected in the site planning.

Should you have any questions or require additional information, please do not hesitate to contact the undersigned at (908)754-8383.

Sincerely,
ANS Geo, Inc.

A handwritten signature in blue ink, appearing to read "Atul N. Shah", is written over a horizontal blue line.

Atul N. Shah, PE
President
NJ PE License #24GE03443900
ANS/RM

Reported: The Nader Group, LLC-(3); File – (1)

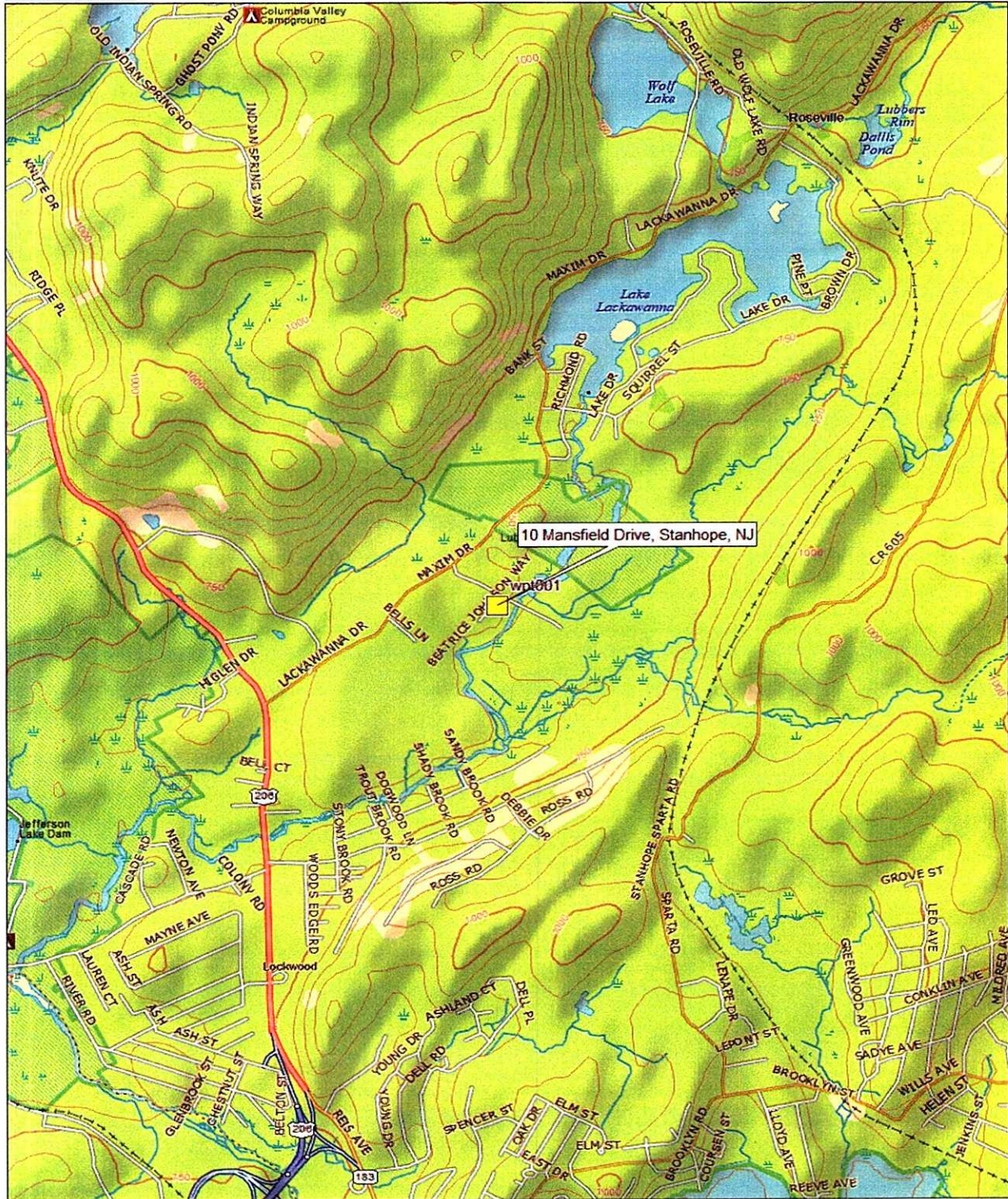
Appendix-A

GOOGLE MAP

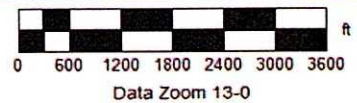


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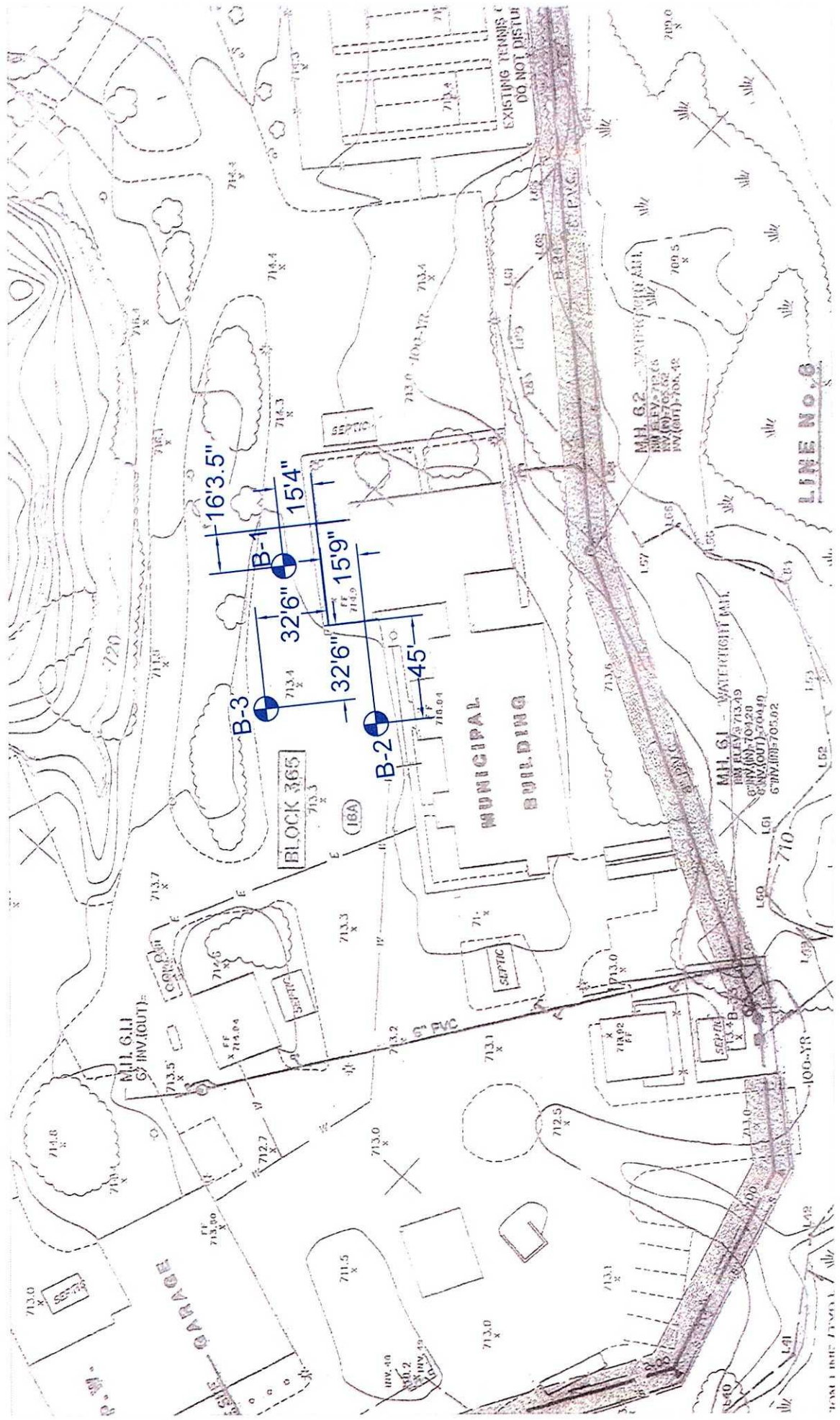


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SITE LOCATION MAP
 10 Mansfield Drive, Stanhope, NJ

ANS Geo, Inc.
 4405 South Clinton Avenue, Suite-
 South Plainfield, NJ 07080-121



CLIENT: The Nader Group, LLC
 PROJECT: 10 Mansfield Dr, Stanhope, NJ
 ANS CONSULTANTS INC.
 4405 SOUTH CLINTON AVE
 SO. PLAINFIELD, NJ, 07080
 PHONE: (908) 754 8383 FAX: (908) 754 8633
 BY: Dharmin Parekh DATE: 11/17/2020
 Project No: GEO-269

SOIL BORING LOCATION PLAN
 SCALE: N.T.S.

LEGEND:
 Soil Boring Location

DRILL HOLE LOG

BORING NO.: B-1

PROJECT: Byram Municipal Building
CLIENT: The Nader Group, LLC
LOCATION: 10 Mansfield Dr, Stanhope, NJ
DRILLER: JESUS, EDWIN & A. SHAH
DRILL RIG: ACKER XLS
DEPTH TO WATER > INITIAL ∇ :

PROJECT NO.: Geo-269
DATE: 10-30-2020
ELEVATION: N/A
LOGGED BY: Syed Abbas

AT COMPLETION ∇ :

ELEVATION/ DEPTH	WELL DETAIL	SOIL SYMBOLS, SAMPLERS AND TEST DATA	USCS	Description	NM	DD	STANDARD PENETRATION TEST		
							DEPTH	N	CURVE
0			16- 9- 5- 2	FILL			0'-2'	14	10 30 50
			4- 3- 5- 7	CL-ML			2'-4'	8	
3			8- 8- 11- 11	SP/GP			4'-6'	19	
6			10- 11-	SP/GP			6'-8'	21	
9			5- 5- 10- 13	SP-SM			8'-10'	15	
12			11- 10- 6- 4	ML			10'-12'	16	
15				Augur down. Augur refusal @ 14'-9".					
18				End of boring.					
21									

Perched water @ 1'-2"

This information pertains only to this boring and should not be interpreted as being indicative of the site.

DRILL HOLE LOG

BORING NO.: B-2

PROJECT: Byram Municipal Building
CLIENT: The Nader Group, LLC
LOCATION: 10 Mansfield Dr, Stanhope, NJ
DRILLER: JESUS, EDWIN & A. SHAH
DRILL RIG: ACKER XLS
DEPTH TO WATER > INITIAL ∇ :

PROJECT NO.: Geo-269
DATE: 10-30-2020
ELEVATION: N/A
LOGGED BY: Syed Abbas

AT COMPLETION ∇ :

ELEVATION/ DEPTH	WELL DETAIL	SOIL SYMBOLS, SAMPLERS AND TEST DATA	USCS	Description	NM	DD	STANDARD PENETRATION TEST		
							DEPTH	N	CURVE
0			FILL	6" Thick Asphalt Pavement. Fill: DGA: gray f/c sand, trace silt, some f/c gray crushed stones, s/wet. @ 0-6": Dark brown and orange clayey silt, trace f/c sand, trace fine gravel, s/wet, stiff. Purged water @ 0-10".			0'-2'	23	
3			CL-ML	Orange clayey silt, little f/m sand, trace fine gravel, s/wet, soft.			2'-4'	6	
6			CL-ML	Gray-orange-brown clayey silt, some f/m sand, little f/c gravel, moist, medium stiff.			4'-6'	15	
9			SP-SM	Grayish orange f/c sand, trace silt, some f/m gravel, wet, s/compact.			6'-8'	15	
9			SP/GP	Grayish orange f/c sand and f/c gravel, trace silt, wet, s/compact.			8'-10'	13	
12			ML	Gray silt, wet, soft.			10'-12'	6	
15			ML	Gray silt, wet, soft.			15'-17'	8	
18				Augured down. Augur refusal @ 19'-2".					
21				End of boring.					

Perched water @ 0 -10"

This information pertains only to this boring and should not be interpreted as being indicative of the site.

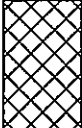
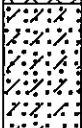
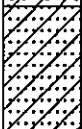



DRILL HOLE LOG

BORING NO.: B-3

PROJECT: Byram Municipal Building
 CLIENT: The Nader Group, LLC
 LOCATION: 10 Mansfield Dr, Stanhope, NJ
 DRILLER: JESUS, EDWIN & A. SHAH
 DRILL RIG: ACKER XLS
 DEPTH TO WATER> INITIAL ∇ :

PROJECT NO.: Geo-269
 DATE: 10-30-2020
 ELEVATION: N/A
 LOGGED BY: Syed Abbas

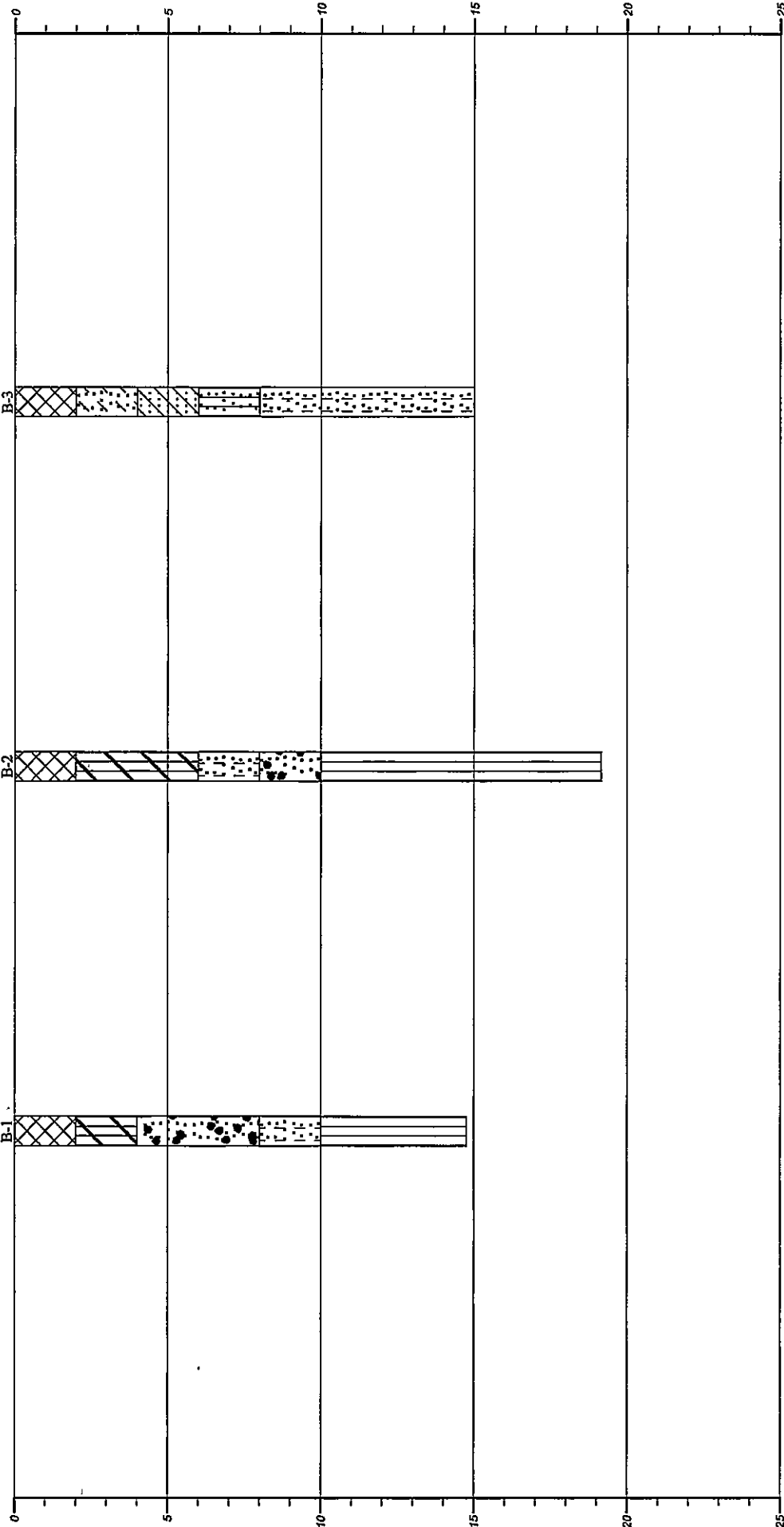
AT COMPLETION ∇ :

ELEVATION/ DEPTH	WELL DETAIL	SOIL SYMBOLS, SAMPLERS AND TEST DATA	USCS	Description	NM	DD	STANDARD PENETRATION TEST		
							DEPTH	N	CURVE
0			20- 9- 4- 5-	FILL 5" Thick Asphalt Pavement. Fill: DGA and asphalt: Gray and black f/c sand, trace silt, some f/c gray crushed stones, s/wet, medium dense.			0'-2'	13	10 30 50
3			7- 7- 9- 11	SP-SC @ 0'-10": Dark gray-dark brown and orange clayey silt, little f/c sand, little f/c gravel, s/wet, soft. Purged water @ 0-6".			2'-4'	16	
6			11- 8- 7- 14	SC Gray and dark orange brown f/c sand, trace clayey silt, some f/c gravel, s/ wet, s/compact.			4'-6'	15	
6			6- 7- 7- 7	SM-ML Grayish orange clayey f/c sand, little f/ m gravel, s/wet, s/compact. Grayish orange silty f/c sand, some f/c gravel, wet, s/compact.			6'-8'	14	
9			8- 8- 8- 9	SP-SM Grayish orange f/c sand, trace silt, some f/c gravel, wet, s/compact.			8'-10'	16	
12			8- 12- 16- 17-	SP-SM @ 10'-6": Gray silt, wet, stiff.			10'-12'	28	
15				Augur refusal. End of boring.					
18									
21									

Perched water @ 0-6"

This information pertains only to this boring and should not be interpreted as being indicative of the site.










Depth in Feet



Depth in Feet

Plan View

Strata symbols

-  Fill
-  Silty low plasticity clay
-  Poorly graded sand and gravel
-  Poorly graded sand with silt
-  Silt
-  Blank
-  Poorly graded sand with clay
-  Clayey sand/ Low plasticity clay
-  Poorly graded silty fine sand










ANS CONSULTANTS, INC.
GENERALIZED SOIL PROFILE

DRAWN BY/APPROVED BY	PPP	DATE DRAWN	
HORIZONTAL SCALE: 1"=5'		11/19/2020	
Byram Municipal Building			
PROJECT NO. Geo-269		FIGURE NUMBER	

KEY TO SYMBOLS

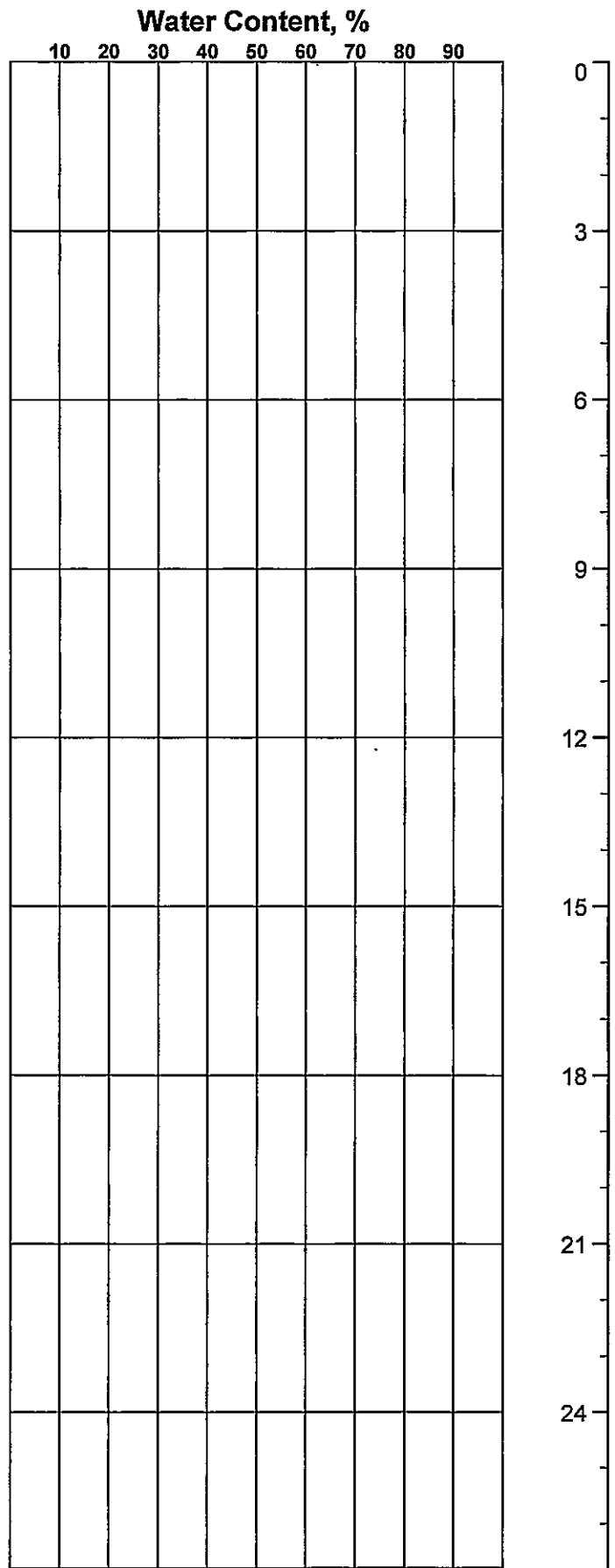
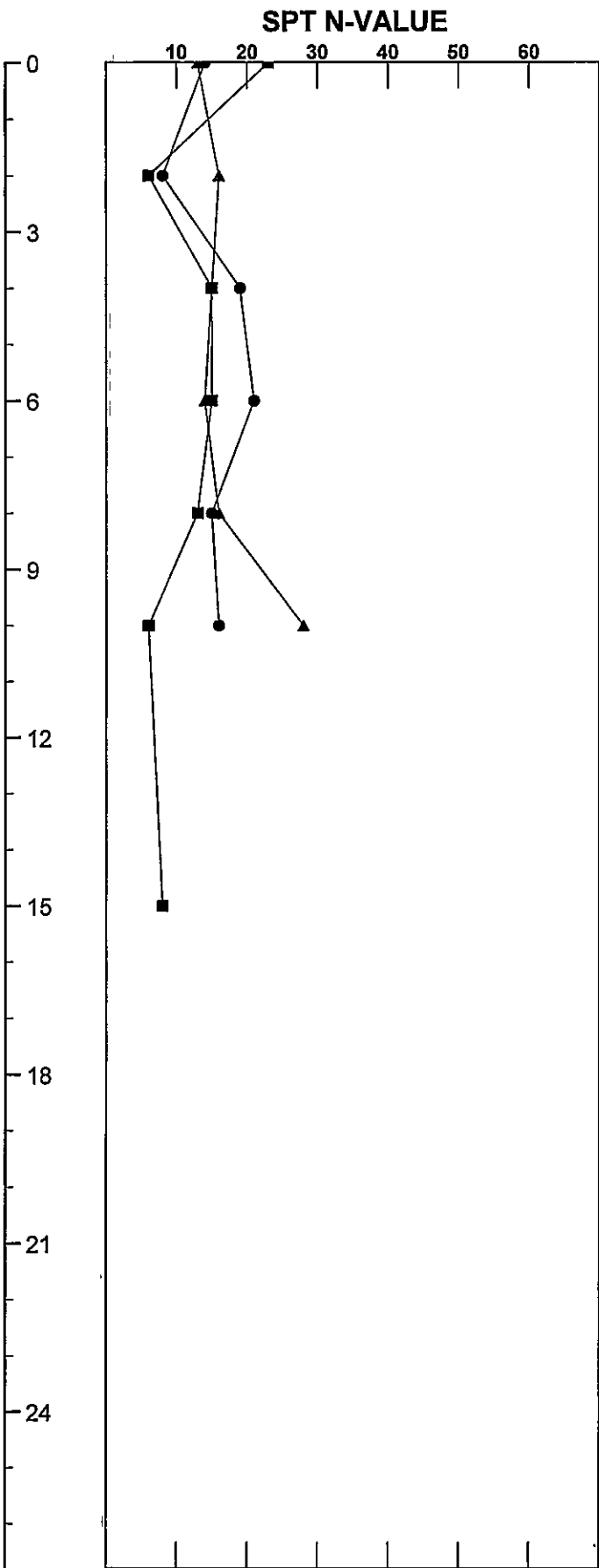
Symbol Description

Strata symbols

	Fill
	Silty low plasticity clay
	Poorly graded sand and gravel
	Poorly graded sand with silt
	Silt
	Blank
	Poorly graded sand with clay
	Clayey sand/ Low plasticity clay
	Poorly graded silty fine sand

Notes:

1. Exploratory borings were drilled on 10-30-2020 using a 4-inch diameter continuous flight power auger.
2. No free water was encountered at the time of drilling or when re-checked the following day.
3. Boring locations were taped from existing features and elevations extrapolated from the final design schematic plan.
4. These logs are subject to the limitations, conclusions, and recommendations in this report.
5. Results of tests conducted on samples recovered are reported on the logs.



Key to Borings

- B-1 ▲ B-3
- B-2

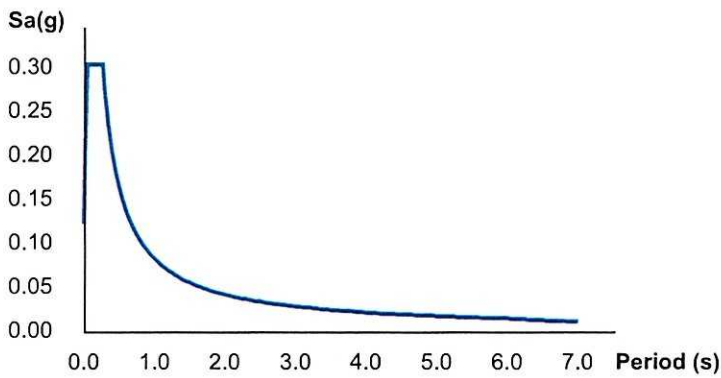
ANS CONSULTANTS, INC.	
Byram Municipal Building	
Vertical Scale: 1 to 3	Figure:

Search Information

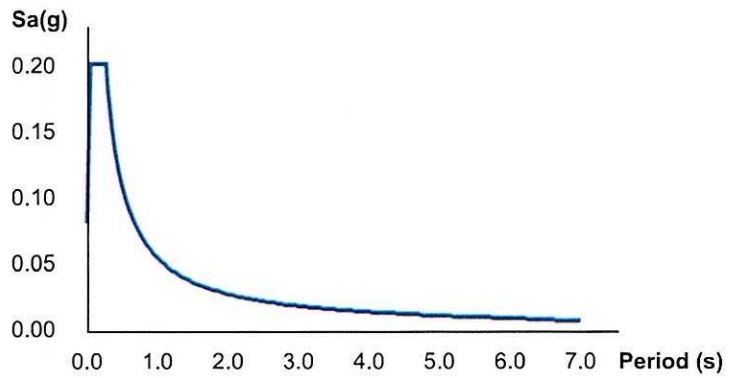
Address: 10 Mansfield Dr, Stanhope, NJ 07874, USA
Coordinates: 40.9365668, -74.7066787
Elevation: 715 ft
Timestamp: 2020-11-10T18:36:05.411Z
Hazard Type: Seismic
Reference Document: ASCE7-16
Risk Category: II
Site Class: C



MCE_R Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S_S	0.233	MCE _R ground motion (period=0.2s)
S_1	0.055	MCE _R ground motion (period=1.0s)
S_{MS}	0.303	Site-modified spectral acceleration value
S_{M1}	0.082	Site-modified spectral acceleration value
S_{DS}	0.202	Numeric seismic design value at 0.2s SA
S_{D1}	0.055	Numeric seismic design value at 1.0s SA

Additional Information

Name	Value	Description
SDC	B	Seismic design category
F_a	1.3	Site amplification factor at 0.2s
F_v	1.5	Site amplification factor at 1.0s

CR _S	0.943	Coefficient of risk (0.2s)
CR ₁	0.937	Coefficient of risk (1.0s)
PGA	0.137	MCE _G peak ground acceleration
F _{PGA}	1.263	Site amplification factor at PGA
PGA _M	0.173	Site modified peak ground acceleration
T _L	6	Long-period transition period (s)
SsRT	0.233	Probabilistic risk-targeted ground motion (0.2s)
SsUH	0.247	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	1.5	Factored deterministic acceleration value (0.2s)
S1RT	0.055	Probabilistic risk-targeted ground motion (1.0s)
S1UH	0.058	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	0.6	Factored deterministic acceleration value (1.0s)
PGAd	0.5	Factored deterministic acceleration value (PGA)

The results indicated here DO NOT reflect any state or local amendments to the values or any delineation lines made during the building code adoption process. Users should confirm any output obtained from this tool with the local Authority Having Jurisdiction before proceeding with design.

Disclaimer

Hazard loads are provided by the U.S. Geological Survey [Seismic Design Web Services](#).

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FIELD SOIL CLASSIFICATION SYSTEM

PARTICLE SIZE IDENTIFICATION

Boulders 8 inch diameter or greater
Cobbles 3 to 8 inch diameter
Gravel Coarse -- 1 to 3 inch
Medium -- 1/2 to 1 inch
Fine -- 4.75 mm to 1/2 inch
Sand Coarse -- 2.0 mm to 4.75 mm
(dia. of pencil lead)
Medium -- 0.425 mm to 2.0 mm
(dia. of broom straw)
Fine -- 0.075 mm to 0.425 mm
(dia. of human hair)
Silt & Clay. . . Smaller than 0.075 mm

RELATIVE PORTIONS

Descriptive Term	Percent
Trace - tr	1 - 10
Some - sm	11 - 20
Adjective - ly	21 - 35
And - &	36 - 50

ABBREVIATIONS

Bn - Brown	
Gy - Gray	
Blk - Black	
Rd - Red	
Or - Orange	
Bl - Blue	
Lt - Light	Coarse grained - c
Dk - Dark	Medium grained - m
Multi - Multi colored	Fine grained- f

COHESIONLESS SOIL

(Gravel, Sand, Silt and Combinations)

DENSITY

Very Loose 05 blows / ft or less
Loose 06 to 10 blows / ft
Medium Dense 11 to 30 blows / ft
Dense 31 to 50 blows / ft
Very Dense 51 blows / ft or more

COHESIVE SOIL

(Clay Silt and Combinations)

CONSISTENCY

Very Soft 01 blow / ft or less
Soft 02 to 4 blows / ft
Medium Stiff 05 to 8 blows / ft
Stiff 09 to 15 blows / ft
Very Stiff 16 to 30 blows / ft
Hard 31 blows / ft or greater

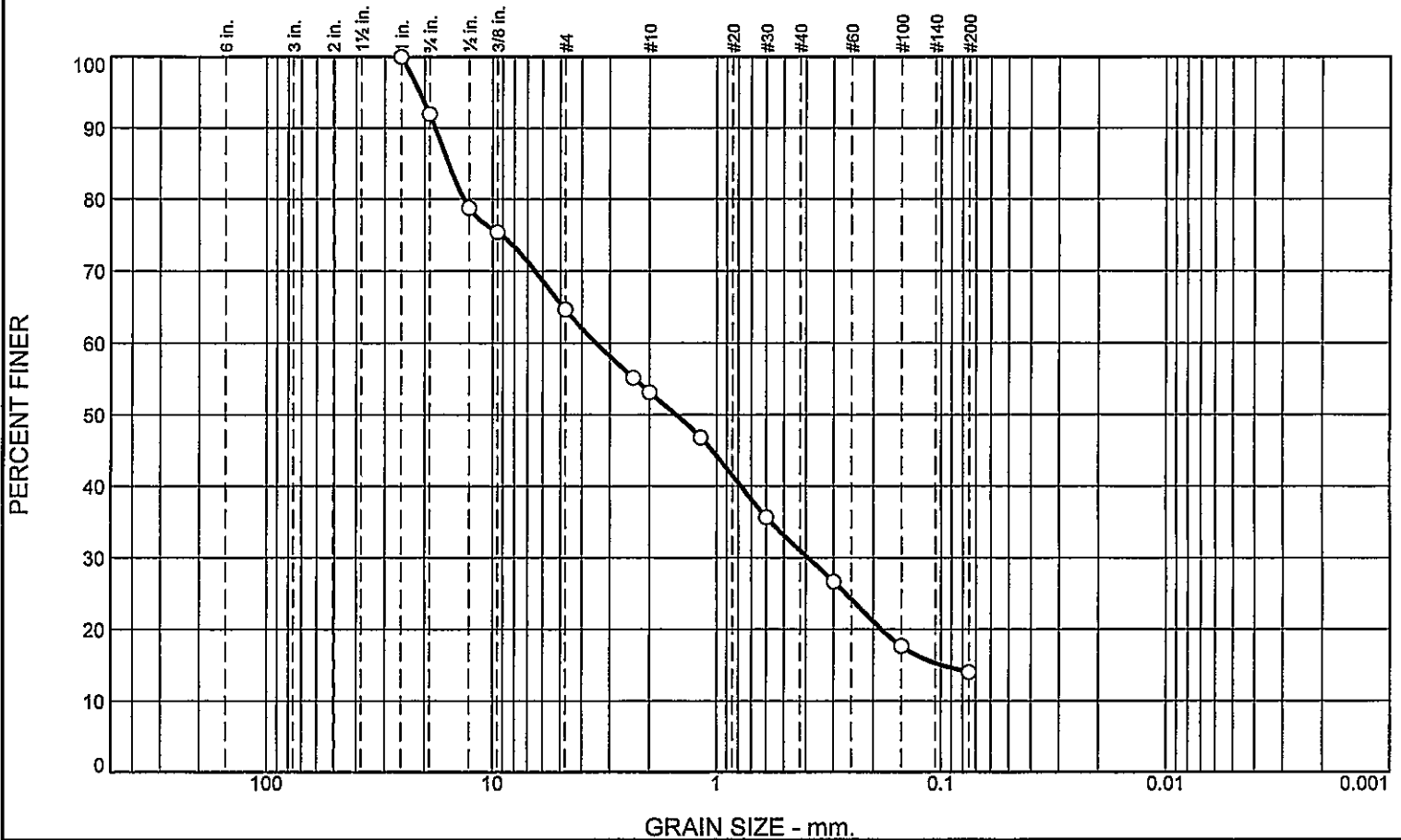
ROCK

R.Q.D.	Rock Quality
00 - 25	Very Poor
25 - 50%	Poor
50 - 75%	Fair
75 - 90%	Good
90 - 100%	Excellent

HSA - Hollow Stem Auger
SS- Split Spoon Sampler
WOR - Weight of Rods
WOH - Weight of Hammer
NR - No Recovery of Sample

Appendix-B

Particle Size Distribution Report As per ASTM D-422



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	8.1	27.3	11.5	22.1	17.0	14.0	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1	100.0		
3/4	91.9		
1/2	78.8		
3/8	75.4		
#4	64.6		
#8	55.2		
#10	53.1		
#16	46.8		
#30	35.7		
#50	26.7		
#100	17.7		
#200	14.0		

Material Description

Brown in color. silty sand with gravel

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₉₀= 17.9996 D₈₅= 15.6727 D₆₀= 3.4643
D₅₀= 1.5212 D₃₀= 0.3903 D₁₅= 0.0998
D₁₀= C_u= C_c=

Classification

USCS= SM AASHTO= A-1-b

Remarks

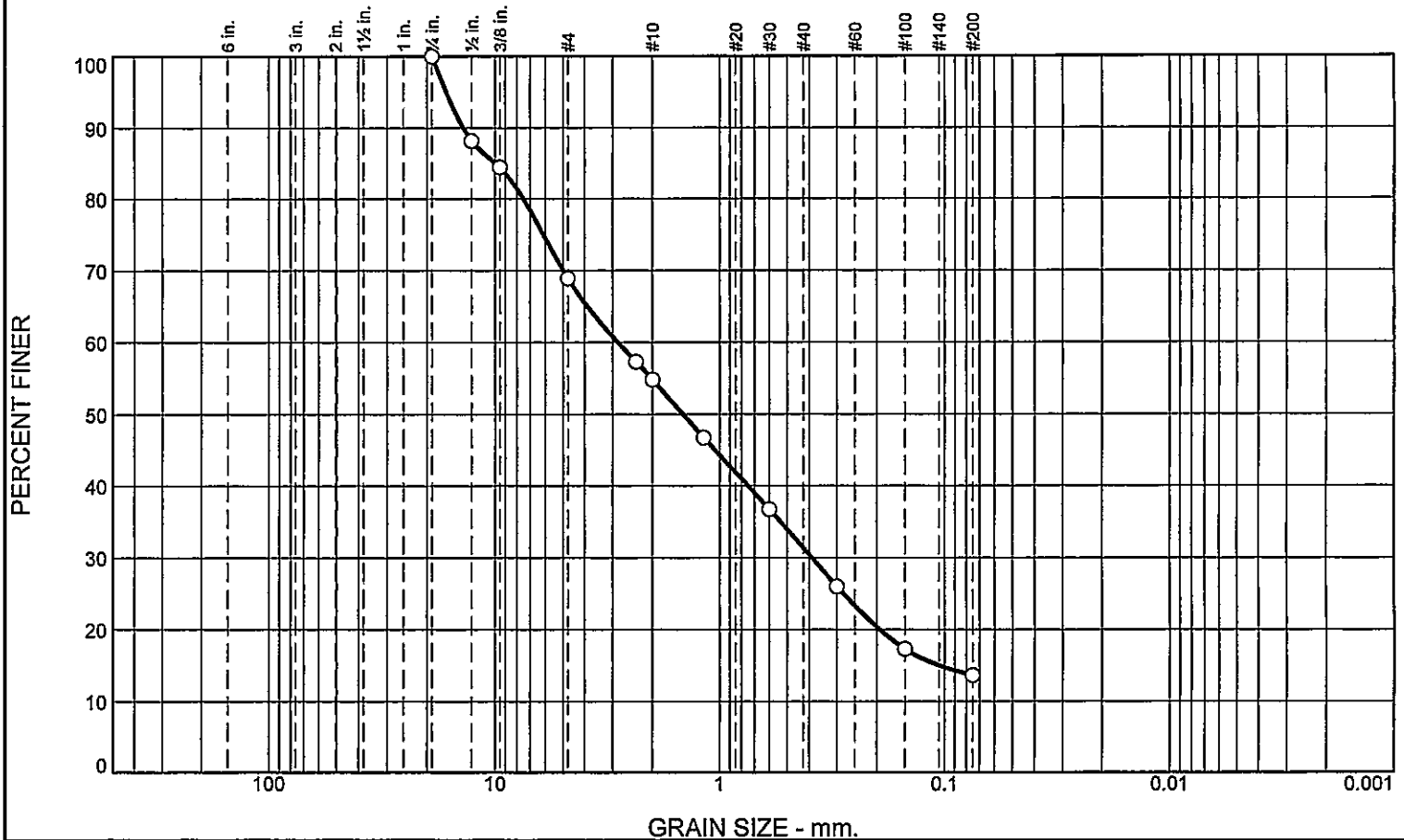
Sample was collected on 10/30/20 and tested on 11/05/20. In-Situ
%MC=11.3
F.M.=3.86

* (no specification provided)

Location: B-1, 4'-6" Sample Number: S-1 Depth: 4'-6" Date: 11/06/2020

ANS CONSULTANTS, INC.	Client: The Nader Group, LLC
South Plainfield, New Jersey	Project: Byram municipal building, 10 Mansfield Drive, Stanhope, NJ
Project No: GEO-269	Figure 1 F 1

Particle Size Distribution Report As per ASTM D-422



GRAIN SIZE - mm.

% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	31.1	14.1	23.4	17.8	13.6	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/4	100.0		
1/2	88.2		
3/8	84.5		
#4	68.9		
#8	57.3		
#10	54.8		
#16	46.7		
#30	36.7		
#50	26.0		
#100	17.3		
#200	13.6		

* (no specification provided)

Material Description

Brown in color, silty sand with gravel

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₉₀= 13.8370 D₈₅= 9.9266 D₆₀= 2.8466
 D₅₀= 1.4635 D₃₀= 0.3881 D₁₅= 0.1060
 D₁₀= C_u= C_c=

Classification

USCS= SM AASHTO= A-1-b

Remarks

Sample was collected on 10/30/20 and tested on 11/05/20. In-Situ
 %MC=12.9
 F.M.=3.63

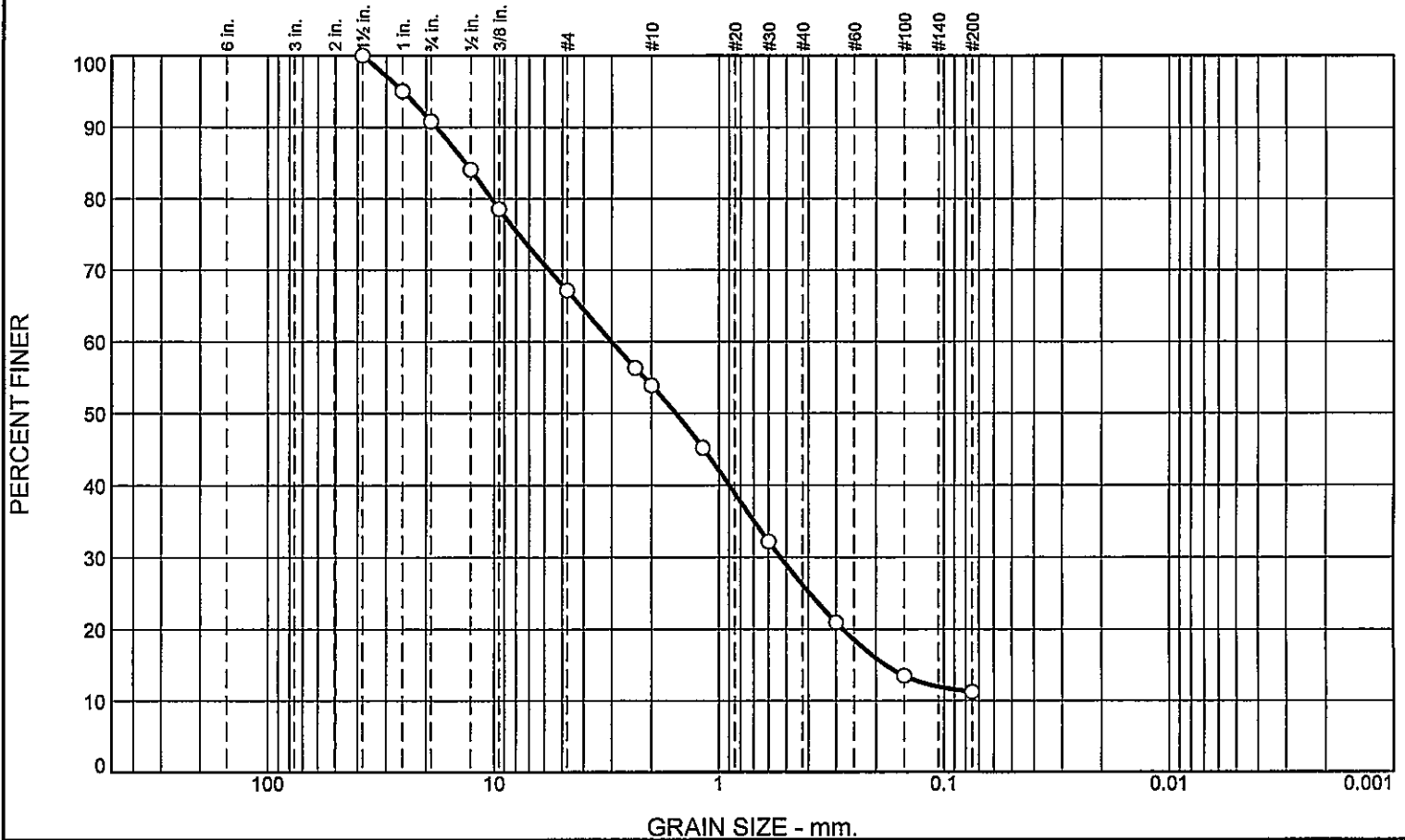
Location: B-2, 6'-8'
 Sample Number: S-2

Depth: 6'-8'

Date: 11/06/2020

<p>ANS CONSULTANTS, INC.</p> <p>South Plainfield, New Jersey</p>	<p>Client: The Nader Group, LLC</p> <p>Project: Byram municipal building, 10 Mansfield Drive, Stanhope, NJ</p> <p>Project No: GEO-269</p>	<p>Figure 2 F 1</p>
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Particle Size Distribution Report As per ASTM D-422



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	9.2	23.6	13.3	27.7	15.0	11.2	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5	100.0		
1	95.0		
3/4	90.8		
1/2	84.1		
3/8	78.6		
#4	67.2		
#8	56.3		
#10	53.9		
#16	45.2		
#30	32.2		
#50	20.9		
#100	13.5		
#200	11.2		

Material Description

Brown in color, poorly graded sand with silt and gravel

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₉₀= 18.0572 D₈₅= 13.3621 D₆₀= 3.0089
D₅₀= 1.5589 D₃₀= 0.5320 D₁₅= 0.1811
D₁₀= C_u= C_c=

Classification

USCS= SP-SM AASHTO= A-1-b

Remarks

Sample was collected on 10/30/20 and tested on 11/05/20. In-Situ
%MC=12.5
F.M.=3.95

* (no specification provided)

Location: B-3, 8'-10'
Sample Number: S-3

Depth: 8'-10'

Date: 11/06/2020

<p>ANS CONSULTANTS, INC.</p> <p>South Plainfield, New Jersey</p>	<p>Client: The Nader Group, LLC</p> <p>Project: Byram municipal building, 10 Mansfield Drive, Stanhope, NJ</p> <p>Project No: GEO-269</p>
<p>Figure 3 F 1</p>	

Appendix-C



Sample procurement using split spoon samplers and augurs



Sample recovery from split spoon samplers



Sample procurement using split spoon samplers and augurs



Bore hole



Sample recovery from split spoon samplers



Sample procurement using split spoon samplers and augurs



Bore hole



Sample procurement using split spoon samplers and augurs



Repatched bore hole