SESI CONSULTING ENGINEERS

FINAL GEOTECHNICAL INVESTIGATION REPORT

FOR

Proposed Self-Storage Building
1060 Nepperhan Avenue
Yonkers, NY

PREPARED FOR:

JCT Development
P. O. Box 1242
Dunedin, Florida 34697

PREPARED BY:

SESI CONSULTING ENGINEERS
12A Maple Avenue
Pine Brook, NJ 07058

Job No.: 11016

DATE:

August 7, 2020
Revised: March 24, 2021

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INTRODUCTION AND PROPOSED CONSTRUCTION

In accordance with our Addendum, we have completed our final geotechnical investigation for the proposed seven-story self-storage building located at 1060 Nepperhan Avenue in Yonkers, NY. The building will have a footprint area of approximately 14,300 square feet. We also understand that the Owner is contemplating designing the building such that four additional stories may be added to the building at a later date. The proposed building will not have a basement or cellar and will be offset approximately 5 feet from the southern property line.

The northern half of the site is currently occupied by a one-story masonry commercial building, which will be demolished to allow the new building to be constructed. According to the Client, this building does not have a basement or cellar. The site is bounded by Neperham Avenue on the west, a parking lot on the north, the Saw Mill River Parkway on the east, and a two-story masonry commercial building on the south. The building to the south appears to abut the southern property line of the site, and it is unknown if this building has a basement or cellar. The Saw Mill River lies just to the east of the parkway. We do not have a survey of the site; however, based on visual observations during our field investigation, the site is relatively flat with little change in surface elevation. The site elevation using Google Earth is approximately 104.

FIELD INVESTIGATION

Our engineering study consisted of performing a site reconnaissance, reviewing existing subsurface soils and geologic data, and performing two field investigations. The first field investigation consisted of two geotechnical soil borings and six environmental borings. Both types of borings were drilled by AARCO on January 8, 2020, using a Geoprobe 7822DT drill rig. The geotechnical borings were drilled using hollow-stem augers, and the soil samples were obtained using an automatic hammer. All environmental borings were terminated at a depth of 5 feet except for SB-4, which terminated at a depth of 10 feet. Both geotechnical borings terminated at a depth of 29 feet below grade. Temporary wells were installed in both geotechnical borings to measure the groundwater level and to obtain groundwater samples for environmental testing. Once the groundwater level readings had been obtained, the temporary wells were removed. Before leaving the site, the driller backfilled the boreholes and patched the pavement.

The second geotechnical investigation consisted of two geotechnical borings drilled on the site on July 15 and 16, 2020. These two borings were also drilled by AARCO using a Diedrich D50 drill rig. The borings were drilled using mud-rotary drilling techniques, and the soil samples were obtained using an automatic hammer. These borings terminated at depths ranging from approximately 65 to 70 feet below grade. A 5-foot long rock core was obtained in boring GB3 in accordance with the procedures specified in ASTM D 2113. Before leaving the site, the driller also backfilled the boreholes and patched the pavement.

The locations of the soil borings are shown on the *Boring Location Plan*, which is included as *Figure 1*. The geotechnical boring logs are presented in *Figures 2* through *5,* and the environmental boring logs are presented in *Figures 6* through *11.* The environmental logs are also included in SESI's environmental report for this site. A key to soil terminology is included as *Figure 12.*

All soil samples in both investigations were obtained according to the procedures specified in ASTM D 1586. All fieldwork, including the environmental sampling, was performed under the full-time technical observation of an engineer/technician from SESI Consulting Engineers. Our representative located the soil borings in the field, maintained continuous logs of the explorations as work proceeded, and coordinated the soil sampling operations in order to develop the required subsurface information.

All soil samples from both investigations were taken to our soils laboratory for classification and appropriate geotechnical testing. The combined laboratory testing for both investigations consisted of performing five tests of the percent passing a No. 200 sieve and five sieve tests performed in accordance with the procedures specified in ASTM D 422. The results of the percent passing a No. 200 sieve tests are included on the boring logs, and the sieve test results are shown in *Figures 13* through *17*.

SUBSURFACE CONDITIONS

Most of the site south of the existing building is paved with asphalt. Beneath the asphalt, a thin layer of fill was encountered in most borings. The fill was about 2 feet thick, and generally consisted of silty sands, with some samples in this layer containing small amounts of gravel. In boring GB-2, concrete and brick fragments were encountered in the fill.

Below the fill, the soils at the site consisted of a glacial alluvium. The upper part of the glacial alluvium consisted primarily of a mix of silty sand and clayey silt. The relative density of the upper part of the glacial alluvium ranged from loose to compact. A clay layer approximately 5 feet thick was also encountered in the upper part of the alluvium in boring GB-3. The upper part of the glacial alluvium was predominately classified as ML and SM soil types according to the Unified Soil Classification System (USCS). The lower part of the glacial alluvium primarily consisted of clean to silty medium to fine to fine sand with a relative density ranging from loose to medium compact, with the lower part of the glacial alluvium being classified as SP and SM.

A thin layer of dense glacial till was encountered in borings GB-3 and GB-4 at a depth of approximately 60 to 65 feet below grade. Fordham Gneiss was encountered at a depth of 65 feet in the 5-foot long rock core run in boring GB-3. The recovery in the rock core was 91%, and the RQD was 65%.

The groundwater level was measured at a depth of approximately 9 to 13 feet below grade. The groundwater level can be expected to fluctuate seasonally, according to recent precipitation, and likely with the water level in the nearby Saw Mill River.

RECOMMENDATIONS

General

Based on the site conditions and the building loads, we evaluated several options for support of both the seven and eleven-story buildings. For the seven-story building, it may be possible to construct the building on a combination of spread footings and a mat foundation with a moderate allowable bearing capacity; however, this option will depend on the final column loads and should be evaluated by the structural engineer. The seven-story building could also be supported entirely on a mat foundation if the column loads require large spread footings.

Another option for support of the seven-story building with a higher allowable bearing capacity would be to construct the building on spread footings or mat supported on rigid inclusions. The rigid inclusions would allow for a higher bearing capacity and help control the anticipated building settlement.

If the eleven-story option is planned, we recommend that the eleven-story building be supported on a mat foundation due to the higher loads. If the allowable bearing capacity is not sufficient or the Client deems the estimated mat settlement to be too large for the eleven-story building, the bearing capacity could be increased, and the settlements may be reduced by installing rigid inclusions beneath the mat foundation.

Demolition

Prior to beginning the construction, the existing building on site should be demolished. The remnant foundations of the existing building, existing pavement, vegetation, topsoil, and any utilities to be abandoned that lie within the new building footprint should be removed. We advise that remnant foundations outside the new building footprint be cut off at least 3 feet below grade to prevent “hard spots” in future paved areas and to sufficient depth so as to not interfere with any proposed utility excavations. The existing concrete and asphalt to be removed may be recycled and reused on site, subject to the approval of the environmental engineer.

Specific Building Area Preparation Recommendations

After the demolition and site clearing is completed as described above, and prior to placing any new fill, the entire building area should be proofrolled using a minimum 10-ton vibratory compactor making a minimum of 4 coverages of the area under the observation of a qualified geotechnical engineer. If any soft areas are observed during the proofrolling, they should be removed and replaced as discussed in the fill section of this report. After the proofrolling is completed, any fill required to be placed to reach the proposed subgrade elevation should be placed in maximum 12-inch thick lifts compacted to a minimum of 92 percent with an average of greater than 95 percent of Modified Proctor density (ASTM D1557).

Foundation Recommendations

After satisfactory completion of the above building area preparation procedures, spread/strip footings and a slab-on-grade floor system may be constructed within the natural soils or controlled compacted fill. If any existing fills are encountered at the footing or mat subgrade, they should be removed and replaced under full-time inspection by a qualified geotechnical engineer. The footings may be designed for a maximum net allowable soil bearing pressure of 1.5 tsf (3,000 psf). Regardless of the loads, the minimum plan dimension of isolated footings should be 36 inches and the minimum width of continuous footings should be 24 inches.

Based on the anticipated column loads, the seven-story building could be constructed on a combination of spread footings and a mat foundation. It is anticipated that up to 2 inches of settlement could occur with this option, with most of the settlement occurring relatively quickly as the load is applied. The differential settlement between adjacent columns would need to be analyzed based on the final column loads to determine if it is acceptable for the proposed structure. A higher bearing capacity could be achieved, and the amount of settlement controlled following a ground improvement program consisting of rigid inclusions (discussed later in this report).

We recommend that a minimum 6-inch thick layer of sand and gravel (DGA) or recycled concrete be placed beneath the floor slab. The material should have a maximum particle size of 1.5 inches and a maximum of 12 percent non-plastic fines (percent passing a number 200 mesh sieve). The subgrade modulus for floor slab design may be 175 pci assuming that a minimum 6-inch layer of granular material is placed. If the rigid inclusion option is chosen, a thicker load transfer platform, on the order of 2 to 3 feet thick, may be required.

Based on the anticipated column loads (up to 450 kips), it will be necessary to support the eleven-story building on a mat foundation. A higher bearing capacity could be achieved, and the amount of settlement controlled following a ground improvement program consisting of rigid inclusions (discussed later in this report).

The bottom of some footing excavations may soften if left open to the weather and construction activity. Any area that becomes softened should be excavated to stable material and backfilled with 3/4-inch clean crushed stone.

The exterior and interior frost-exposed footings should be placed at least 4.0 feet below the adjacent finished grade. Interior footings within heated building areas may be founded at conventional shallow depths below the floor slab. If the neighboring building to the south has a basement or cellar, it will be necessary to drop the footings down to match the elevation of the neighboring foundations.

Mat Foundation

If the mat foundation option is chosen, the mat foundation may be designed using a modulus of subgrade reaction of 100 kips/ft^3. Unless the perimeter subgrade is protected from frost, the exterior portion of the mat should be founded at a minimum depth of 4 feet below grade. If the neighboring building to the south has a basement or cellar, it will be necessary to step the mat down to match the elevation of the neighboring foundations. After any unsuitable material has been removed and replaced, the mat should be founded on a 6-inch thick layer of compacted, crushed stone.

For the seven-story building, settlement at the center of the mat will be approximately 3.8 inches and settlement at the center of the edge of the mat will be approximately 1.9 inches. For the eleven-story building, the equivalent settlements will be approximately 6 inches and 3 inches, respectively. While these settlements are large, the mat foundation will be better able to tolerate large settlements and minimize differential settlements than the spread footings option. If the Client deems these settlements to be too large, rigid inclusions beneath the mat may be used to reduce the settlement.

Settlement at the neighboring building to the south will be comparable to the settlement experienced at the southern edge of the mat, and settlement at the southern building may cause cracking and other distress to this building. Based on the large settlement expected at the edge of the mat, it may be desirable to move the building somewhat farther away from the southern property line to prevent potentially damaging settlement from occurring to the building to the south.

Rigid Inclusions

Rigid inclusions consist of grouted or concrete rigid elements which are constructed under low pressure in augered holes. The holes are advanced using a non-displacement auger, therefore the spoils from the auger are minimal. The holes are drilled on a grid pattern throughout the building footprint down to suitable bearing materials. As the augers are withdrawn from the hole, the grout/concrete is pumped under low head through the augers to the bottom of the augered hole. The augers are withdrawn from the hole and moved to the next location and the process repeated. Once all the grout/concrete inclusions have been installed and load tested, a load transfer platform is constructed over the inclusions to distribute the buildings loads to the inclusions (note: a load transfer platform probably would not be needed if the rigid inclusions are used to reduce the mat settlement). The result is a composite system, where the soil and the alternate foundation/floor slab elements share the new fill and building loads. Some advantages that this system has over a traditional pile foundation are that pile caps and a structural floor system are not required; vibrations and noise levels are substantially less; and it generally takes less time to install then a piled foundation.

Based on our experiences with rigid inclusions, the rigid inclusions would likely extend to approximately 60 feet below grade, and derive support from the glacial till and Fordham Gneiss bedrock. At least one rigid inclusion would be installed at each column, with the more heavily loaded columns requiring additional rigid inclusions. The diameter would probably range from between 15 to 18 inches, and the typical load capacity would be about 150 kips. If the rigid inclusions are used to support the footings, a Load Transfer Platform (LTP) on the order of 2 to 3 feet might be required to transfer the building loads to the rigid elements. The LTP materials generally need to meet a very strict gradation requirement and compaction criteria. The LTP material typically consists of recycled concrete aggregate or dense-graded aggregate materials placed in controlled compacted lifts.

Following the installation of the rigid inclusions, the seven-story building may be supported by conventional spread foundations and utilize a ground floor slab constructed on-grade. Allowable net bearing pressures on the order of 7,000 to 8,000 pounds per square foot will likely be available in proportioning the building foundations. The design team would need to contact at specialty contractor to provide a design-build price and specific design specifications.

Seismic Design and Liquefaction Potential

Based on the blow counts obtained during the initial field investigation, the soils on the site were classified as Site Class F due to their potential for liquefaction. Liquefaction occurs when a loose, saturated, sand is subject to a large shock or vibration such as a seismic event. The saturated soils temporarily lose their strength, and large settlement can occur. Liquefaction is typically assumed to potentially occur down to a depth of 50 feet below grade.

Because of the liquefaction potential on the site, a Multi-Channel Analysis of Surface Waves (MASW) survey was performed on the site on April 22, 2020. Based on the MASW survey, the site was reclassified to Site Class D as defined by the 2020 Building Code of New York State and ASCE 7-16. The following seismic design criteria should be used for this project:

Mapped Spectral Response Acceleration for Short Periods	$S_S = 0.297g$
Mapped Spectral Response Acceleration for 1-Second Period	$S_1 = 0.061g$
Site Coefficient	$F_a = 1.563$
Site Coefficient	$F_V = 2.400$
Spectral Response for short periods	$S_{MS} = 0.463g$
Spectral Response for 1 second period	$S_{M1} = 0.147g$
Design Spectral Response Acceleration for Short Periods	$S_{DS} = 0.309g$
Design Spectral Response Accelerations for 1-Second Period	$S_{D1} = 0.098g$

Further details about the MASW survey may be found in our letter report dated May 1, 2020.

Fill Placement

The excavated soils at the site may be used as structural fill; however, if the rigid inclusion option is chosen, it may not meet the strict gradation requirements for the load transfer platform (LTP). This will need to be confirmed by the specialty contractor. Durable concrete foundation elements may be crushed and reused as compacted fill, provided they are approved by the environmental engineer. Wetting or drying of the fill soils may be required prior to their reuse. Fill should be placed in maximum 12-inch thick lifts, with each layer compacted to the required density using 10-ton vibratory roller. Building area fills should be compacted to a minimum of 92 percent and an average of greater than 95 percent of the Modified Proctor density (ASTM D 1557). Areas which will not have any foundations or other structural loads may be compacted to a minimum of 90 percent of the maximum Modified Proctor density (ASTM D 1557). Backfill in utility trenches located beneath paved areas, the floor slab, or footings and backfill placed around footings should be placed in maximum 6-inch thick layers and compacted to a minimum of 95 percent of Modified Proctor density.

Fill materials may be obtained from on-site sources or from offsite sources. Offsite borrow material, if required, should have a maximum particle size of 6 inches, and the maximum percentage fines (percentage passing a No. 200 mesh sieve) should be 15% to help facilitate construction during wet weather. The “fines” should be non-plastic.

Utility Lines

The site soils will provide suitable support for utility lines. Cobbles greater than 4 inches in diameter should be removed from the utility line subgrade or a minimum 4-inch thick sand layer placed beneath the utility lines. If the bottom of the excavation for any utility lines falls within soft or organic soils, the excavation should be extended an additional 12-inches and replaced with ¾-inch clean crushed stone or clean sand and gravel. It may be desirable to use flexible couplings where utility lines enter building areas if mat foundations are used.

Backfill material placed around utility lines to 6 inches above the utility lines should have a maximum particle size of 1.5 inches. Backfill of utility trenches beneath paved areas, the floor slab, or footings should be placed in maximum 6-inch thick lifts and compacted to a minimum of 92 percent and average of 95 percent of Modified Proctor density (ASTM D 1557). Trench backfill in other areas should be compacted to 90 percent of Modified Proctor density (ASTM D 1557).

Temporary Slopes and Excavations

Temporary soil cut and fill slopes should be limited to a maximum of 1.5 horizontal to 1 vertical for slopes up to 15 feet high and 2 horizontal to 1 vertical for slopes greater than 15 feet high. Slopes higher than 15 feet or those with surcharge loads should also be evaluated by a qualified geotechnical engineer.

All temporary excavations greater than 4 feet in depth should have the sides sloped back or be appropriately sheeted and braced in accordance with all applicable codes. All excavations should be performed in accordance with OSHA requirements, including but not limited to, temporary shoring, trench boxes, and benching and be evaluated by a qualified Geotechnical Engineer.

<u>Monitoring</u>

Since the new building will be located close to the existing building to the south, we recommend that a pre-condition survey be performed for the existing building. The pre-condition survey should consist of photographing this building inside and out to document the condition of the building prior to construction commencing. We recommend that vibration monitors be installed in the neighboring building during construction operations that could potentially generate large vibrations such as proofrolling. Optical monitoring points could also be placed on the neighboring building to monitor settlement and changes in any existing cracks while the new building is constructed.

LIMITATIONS

The subsurface investigation performed identifies the subsurface conditions only at the locations of the explorations and at the depths where the samples were taken. SESI Consulting Engineers reviews the published geologic data and the field and laboratory data and uses their professional judgment and experience to render an opinion on the subsurface conditions throughout the site. Because the actual subsurface conditions may differ, we recommend that SESI be retained to provide construction inspection in order to minimize the risks associated with unanticipated conditions.

This report should not be used:

1. When the nature of the proposed building is changed;
2. When the size or configuration of the proposed building is altered;
3. When the location or orientation of the proposed building is modified;
4. When there is a change in ownership; or
5. For application to an adjacent or any other site.

SESI shall not accept any responsibility for problems, which may occur if SESI is not consulted when there are changes to the factors considered in this report's development. The soil logs should not be separated from the Engineering Report in order to minimize the possibility of soil log misinterpretation.

DISCLAIMER

This Report was prepared by SESI for the sole and exclusive use of JCT Development. Nothing under the Professional Services Agreement between SESI and its client JCT Development shall be construed to give any rights or benefits to anyone other than Client and SESI, and all duties and responsibilities undertaken pursuant to the Agreement will be for the sole and exclusive benefit of Client and SESI and not for the benefit of any other party. This Report has been prepared and issued subject to the express condition that same is not to be disseminated to anyone other than Client, without the advance written consent of SESI (which SESI, in its sole discretion, is free to grant or withhold). Use of the Report by any other person is unauthorized and such use is at the sole risk of the user.

TABLE I

SUMMARY OF SOIL DESIGN PARAMETERS

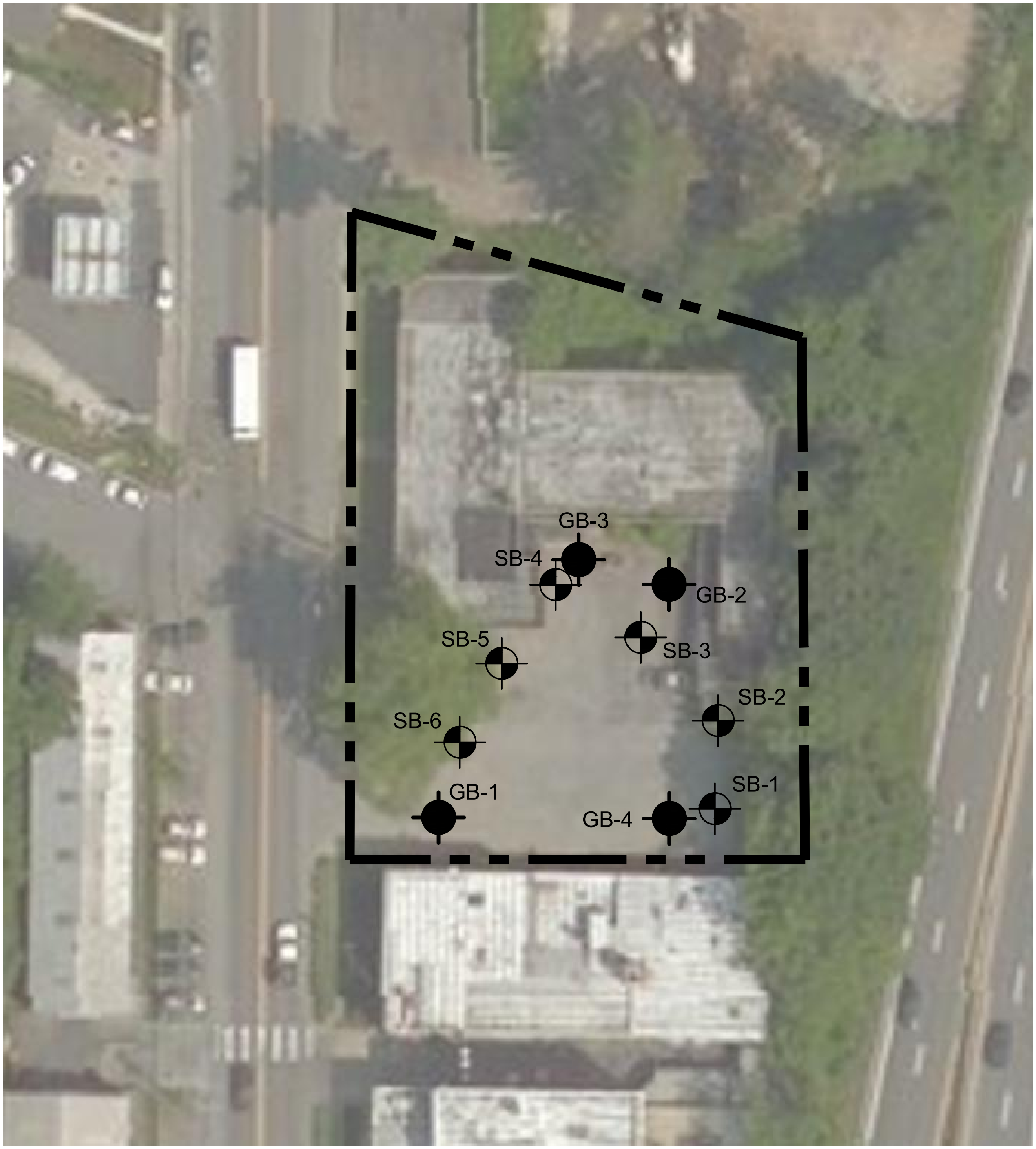
	PARAMETER	VALUE
1.	Total Unit Weight	120 pcf
2.	Angle of Internal Friction - Backfill against Structures	32 degrees
3.	Earth Pressure Coefficient (See Note 1)	
	Active Earth Pressure (Ka)	0.31
	Earth Pressure @ Rest (Ko)	0.47
	Passive Earth Pressure (Kp)	3.25
4.	Coefficient of Sliding (concrete over soil)	0.35
5.	Subgrade Modulus for Floor Slab Design	100 pci
6.	Subgrade Modulus for Mat Design	58 pci
7.	Permanent Slopes (above groundwater)	
	Maximum Cut Slope in Soil	2.0 H:1V
	Maximum Fill Slope in Soil	2.0 H:1V
8.	Seismic Design Criteria – Site Class	D
9.	Minimum Footing Depth (exterior footings)	4 feet

Notes:

1.) A drainage medium should be installed along all retaining walls to avoid hydrostatic pressures from developing.

2.) Compaction equipment used within 5± feet of permanent walls should not weigh more than 5,000 pounds.

3.) Recommended slopes in #8 above do not consider surcharge loadings above the slope. Any slope greater than 15 feet high and/or have surcharge loadings above the wall should be evaluated by a geotechnical engineer



SCALE: 1"=50'

0 50 100

LEGEND:

- PROPERTY LINE

GB-1 - GEOTECHNICAL BORINGS

SB-1 - ENVIRONMENTAL BORINGS

NOTE:
THIS PLAN IS FOR LOCATING BORINGS ONLY.

REFERENCE
AERIAL MAP TAKEN FROM BING MAPS, DATED 2020.

FIG-1

1060 NEPPERHAN AVENUE
YONKERS, NY 10703

BORING LOCATION PLAN

SESI CONSULTING ENGINEERS D.P.C.

SOILS / FOUNDATIONS
SITE DESIGN
ENVIRONMENTAL

12A MAPLE AVE. PINE BROOK, N.J. 07058 PH: 973-808-9050

DRAWN BY:	YY
CHECKED BY:	ERK
SCALE:	AS NOTED
DATE:	08/06/2020
JOB NO.:	11016

N:\ACAD\11016\CAD\11016 FIG-1 BORING LOCATION PLAN.DWG 08/06/20 10:07:47AM, Stevepan, LAYOUT:FIG-1

SESI CONSULTING ENGINEERS	PROJECT NAME:	1060 Neperham Avenue	BORING NO.	GB-1
	LOCATION:	Yonkers, NY	JOB NO.	11016
	METHOD:	4.25" Augers/Split Spoons	GROUND ELEVATION:	104 ±
BORING BY: AARCO	DATE STARTED:	1/8/2020	GROUNDWATER TABLE DEPTH	
INSPECTOR: JWK	DATE COMPLETED:	1/8/2020	0 Hr. 12' Date 1/8/2020	24 Hr. NE Date NE

DEPTH (ft) 0	SAMPLE No.	REC (in)	DEPTH FROM (ft)	DEPTH TO (ft)	Blows on Spoon 0/6	6/12	12/18	18/24	N (bl/ft)	SOIL DESCRIPTION AND STRATIFICATION	Symbol USCS
	S-1	18	0	2	33	18			28	Fill: Tan-brown fine SAND, some Silt	FILL
							10	6			
	S-2	18	2	4	7	8			16	Tan-brown fine Sand, some Silt	
							8	8			SM
5											
	S-3A	18	5	6	3	3			5	Tan-brown medium to fine SAND, little Silt	
	S-3B		6	7			2	1		Brown SILT, and fine Sand (WC) = 9.2% (-200) = 50.7%	ML
	S-4	18	7	9	WHO	2			5	Tan-brown medium to fine SAND, some Silt	
							3	4			
10											
	S-5	20	10	12	6	6			12	Tan-brown medium to fine SAND, little Silt	SM
							6	5			
15											
	S-6	20	15	17	1	1			2	Light brown SILT, little fine Sand	ML
							1	3			
20											
	S-7	20	20	22	4	2			3	Light brown medium to fine SAND, little Silt with occasional seams	
							1	3		of Clayey Silt	
										(WC) = 19.4% (-200) = 16.2%	
											SM
25											
	S-8	18	25	27	6	6			9	Light brown medium to fine SAND, little Silt	
							3	4			
	S-9	18	27	29	4	5			11	Light brown SILT, and medium to fine Sand	ML
							6	7			
30										BORING COMPLETE AT 29'-0" ±	
35											
40											

Nominal I.D. of Hole	in
Nominal I.D. of Split Barrel Sampler	1⅜ in
Weight/type of Hammer on Drive Pipe	300 lb
Weight/type of Hammer on Split Barrel	140 lb
Drop of Hammer on Drive Pipe	in
Core Size	in

The subsurface information shown hereon was obtained for the design and estimating purposes for our client. It is made available to authorized users only that they may have access to the same information available to our client. It is presented in good faith, but it is not intended as a substitute for investigations, interpretations or judgment of such authorized users. Information on the logs should not be relied upon without the geotechnical engineers recommendations contained in the report from which these logs were extracted.

Pp: Pocket Penetrometer; WOH: Weight of Hammer; WOR: Weight of Rod

Approximate Change in Strata: ____________ Inferred Change in Strata: _ _ _ _ _ _ _ _ _ _ _ _ _

Soil descriptions represent a field identification after D. M. Burmister unless otherwise noted.

FIGURE 2

SESI CONSULTING ENGINEERS	PROJECT NAME:	1060 Neperham Avenue	BORING NO.	**GB-2**
	LOCATION:	Yonkers, NY	JOB NO.	11016
	METHOD:	4.25" Augers/Split Spoons	GROUND ELEVATION:	104 ±
BORING BY: AARCO	DATE STARTED:	1/8/2020	GROUNDWATER TABLE DEPTH	
INSPECTOR: JWK	DATE COMPLETED:	1/8/2020	0 Hr. 13.2' Date 1/8/2020	24 Hr. NE Date NE

DEPTH (ft) 0	SAMPLE No.	REC (in)	DEPTH FROM (ft)	DEPTH TO (ft)	Blows on Spoon 0/6	6/12	12/18	18/24	N (bl/ft)	SOIL DESCRIPTION AND STRATIFICATION	Symbol USCS
	S-1	20	0	2	24	9			15	Fill: Tan-brown fine SAND, some Silt, trace fine Gravel	FILL
							6	5			
	S-2	18	2	4	4	3			5	Brown Clayey SILT, little fine Sand	
							2	4			ML
5											
	S-3	1	5	7	1	2			4		
							2	2			
	S-4	18	7	9	5	7			12	Olive-gray medium to fine SAND, and Silt, trace fine Gravel	
							5	5		(WC) = 16.3% (-200) = 46.2%	
10											SM
	S-5	20	10	12	2	2			10	Olive-gray to brown medium to fine SAND, some Silt	
							8	9			
15											
	S-6	2	15	17	3	5			12	Gray coarse to fine GRAVEL, some silt, little fine Sand	GM
							7	10			
20											SM
	S-7A	20	20	21	5	6			15	Tan coarse to fine SAND, little Silt	
	S-7B		21	22			9	12		Tan Clayey SILT, little medium to fine Sand	ML
											SM
25											
	S-8	20	25	27	3	6			10	Tan-brown medium to fine SAND, little Silt	
							4	4			SP-SM
	S-9	22	27	29	2	3			6	Same as above…	
							3	3			
30										BORING COMPLETE AT 29'-0" ±	
35											
40											

Nominal I.D. of Hole	in
Nominal I.D. of Split Barrel Sampler	1⅜ in
Weight/type of Hammer on Drive Pipe	300 lb
Weight/type of Hammer on Split Barrel	140 lb
Drop of Hammer on Drive Pipe	in
Core Size	in

The subsurface information shown hereon was obtained for the design and estimating purposes for our client. It is made available to authorized users only that they may have access to the same information available to our client. It is presented in good faith, but it is not intended as a substitute for investigations, interpretations or judgment of such authorized users. Information on the logs should not be relied upon without the geotechnical engineers recommendations contained in the report from which these logs were extracted.

Pp: Pocket Penetrometer; WOH: Weight of Hammer; WOR: Weight of Rod

Approximate Change in Strata: ____________ Inferred Change in Strata: _ _ _ _ _ _ _ _ _ _ _ _ _

Soil descriptions represent a field identification after D. M. Burmister unless otherwise noted.

FIGURE 3

SESI CONSULTING ENGINEERS

PROJECT NAME:	1060 Nepperhan Avenue	BORING NO.	**GB-3**
LOCATION:	Yonkers, NY	JOB NO.	11016
METHOD:	Mud Rotary Drilling	GROUND ELEVATION:	104 ±
BORING BY: AARCO	DATE STARTED: 7/15/2020	GROUNDWATER TABLE DEPTH	
INSPECTOR: DA	DATE COMPLETED: 7/15/2020	0 Hr. 9'± Date 7/15/20	24 Hr. NE Date NE

DEPTH (ft) 0	SAMPLE No.	REC (in)	DEPTH FROM (ft)	DEPTH TO (ft)	Blows on Spoon 0/6	6/12	12/18	18/24	N (bl/ft)	SOIL DESCRIPTION AND STRATIFICATION	Symbol USCS
	S-1	14	0	2	12	5			9	(5" Asphalt, 5" Stone) Brown coarse to fine SAND, some Silt, trace	
							4	7		fine Gravel	SM
	S-2	24	2	4	10	12			28	Brown Clayey SILT, little medium to fine Sand, trace fine Gravel	
							16	14		W.C. = 23.3% (-200) = 80.2%	
5											
	S-3	18	5	7	8	7			14	Same as above…	ML
							7	7			
	S-4	14	7	9	7	6			10	Gray Clayey SILT, some fine Sand, trace fine Gravel	
							4	10		W.C. = 23.0% (-200) = 63.4%	
10										- - - - - - - - - - - - - - - -	
	S-5	10	10	12	8	10			14	Olive-brown fine SAND, trace Silt	SP
							4	5			
	S-6	8	12	14	WOH	2			5	Tan Silty CLAY, little fine Sand	
							3	3			
15											CL
	S-7	14	15	17	8	10			22	Same as above…	
							12	11			
	S-8	14	17	19	12	11			21	Brown Clayey SILT, little fine Sand	
							10	9			ML
20										- - - - - - - - - - - - - - - -	
	S-9	15	20	22	3	3			5	Brown fine SAND, some Silt	
							2	4			
25											
	S-10	13	25	27	8	5			10	Same as above…	SM
							5	4			
	S-11	14	27	29	9	3			6	Same as above…	
							3	3			
30											
	S-12	15	30	32	2	3			7	Same as above…	
							4	7			
	S-13	17	32	34	4	4			12	Brown medium to fine SAND, trace Silt	
							8	8			
35											
	S-14	14	35	37	4	4			9	Same as above…	SP
							5	6			
40											

Nominal I.D. of Hole	in
Nominal I.D. of Split Barrel Sampler	1⅜ in
Weight/type of Hammer on Drive Pipe	300 lb
Weight/type of Hammer on Split Barrel	140 lb
Drop of Hammer on Drive Pipe	in
Core Size	in

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Pp: Pocket Penetrometer; WOH: Weight of Hammer; WOR: Weight of Rod

Approximate Change in Strata: ____________ Inferred Change in Strata: _ _ _ _ _ _ _ _ _ _ _ _ _

Soil descriptions represent a field identification after D. M. Burmister unless otherwise noted.

FIGURE 4

SESI CONSULTING ENGINEERS

PROJECT NAME:	1060 Nepperhan Avenue	BORING NO.	**GB-3**
LOCATION:	Yonkers, NY	JOB NO.	11016
METHOD:	Mud Rotary Drilling	GROUND ELEVATION:	104 ±
BORING BY: AARCO	DATE STARTED 7/15/2020	GROUNDWATER TABLE DEPTH	
INSPECTOR: DA	DATE COMPLETED 7/15/2020	0 Hr. 9'± Date 7/15/20	24 Hr. NE Date NE

DEPTH (ft)	SAMPLE No.	REC	DEPTH FROM	DEPTH TO	Blows on Spoon 0/6	6/12	12/18	18/24	N	SOIL DESCRIPTION AND STRATIFICATION	Symbol
40		(in)	(ft)	(ft)					(bl/ft)		USCS
	S-15	17	40	42	4	4			10	Brown medium to fine SAND, trace Silt	
							6	6			
											SP
45											
	S-16	14	45	47	4	10			20	Same as above…	
							10	10			
										- - - - - - - - - -	
50											
	S-17	21	50	52	3	3			6	Brown fine SAND, little Silt	
							3	4			
55											
	S-18	12	55	57	11	12			23	Same as above…	SM
							11	12			
60											
	S-19	8	60	60.3	20	100/3"				Brown medium to fine SAND, little Silt, trace fine Gravel	
										- - - - - - - - - -	
65											
	S-20	0	65	65	50/0"					Spoon Refusal, rock coring from 65ft to 70ft	
	C1	60	65			REC = 55"/60" = 91%					
						RQD = 39"/60" = 65%				Fordham Gneiss	
70				70						- - - - - - - - - -	
										BORING COMPLETED AT 70'-0" ±	
75											
80											

Nominal I.D. of Hole	in
Nominal I.D. of Split Barrel Sampler	1⅜ in
Weight/type of Hammer on Drive Pipe	300 lb
Weight/type of Hammer on Split Barrel	140 lb
Drop of Hammer on Drive Pipe	in
Core Size	in

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Pp: Pocket Penetrometer; WOH: Weight of Hammer; WOR: Weight of Rod

Approximate Change in Strata: ____________ Inferred Change in Strata: _ _ _ _ _ _ _ _ _ _ _ _ _

Soil descriptions represent a field identification after D. M. Burmister unless otherwise noted.

FIGURE 4

SESI CONSULTING ENGINEERS

PROJECT NAME:	1060 Nepperhan Avenue	BORING NO.	**GB-4**
LOCATION:	Yonkers, NY	JOB NO.	11016
METHOD:	Mud Rotary Drilling	GROUND ELEVATION:	104 ±
BORING BY: AARCO	DATE STARTED: 7/16/2020	GROUNDWATER TABLE DEPTH	
INSPECTOR: DA	DATE COMPLETED: 7/16/2020	0 Hr. NE, Date 7/16/20	24 Hr. NE, Date NE

DEPTH (ft)	SAMPLE No.	REC	DEPTH FROM	DEPTH TO	Blows on Spoon				N	SOIL DESCRIPTION AND STRATIFICATION	Symbol
0		(in)	(ft)	(ft)	0/6	6/12	12/18	18/24	(bl/ft)		USCS
		0	0	2	18	10			15	(5" Asphalt, 5" Stone) No recovery	
							5	5			
	S-1	11	2	4	8	14			40	Brown coarse to fine Sand, and Silt, trace fine Gravel	SM
							26	15		W.C. = 13.6% (-200) = 47.4%	
5											
	S-2	20	5	7	12	13			28	Same as above…	
							15	24		W.C. = 13.1% (-200) = 48%	
	S-3	20	7	9	23	23			42	Olive-brown to dark olive Clayey SILT, trace fine Sand	ML
							19	14			
10											
	S-4	16	10	12	2	7			20	Olive-brown fine SAND, little Silt, trace Gravel	SM
							13	12			
	S-5	16	12	14	9	8			19		
							11	14		Tan Clayey SILT, trace fine Sand	
15											
	S-6	9	15	17	14	18			37	Brown Clayey SILT, trace fine Sand	ML
							19	19			
	S-7	10	17	19	10	14			43	Same as above…	
							29	27			
20											
	S-8	10	20	22	14	21			46	Brown fine SAND, trace Silt	
							25	26			
25											
	S-9	16	25	27	3	6			11	Same as above…	
							5	6			
30											
	S-10	15	30	32	3	3			7	Same as above…	SP
							4	4			
	S-11	16	32	34	3	4			9	Same as above…	
							5	8			
35											
	S-12	10	35	37	4	3			7	Same as above…	
							4	4			
40											

Nominal I.D. of Hole	in
Nominal I.D. of Split Barrel Sampler	1⅜ in
Weight/type of Hammer on Drive Pipe	300 lb
Weight/type of Hammer on Split Barrel	140 lb
Drop of Hammer on Drive Pipe	in
Core Size	in

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Pp: Pocket Penetrometer; WOH: Weight of Hammer; WOR: Weight of Rod

Approximate Change in Strata: ____________ Inferred Change in Strata: _ _ _ _ _ _ _ _ _ _ _ _ _

Soil descriptions represent a field identification after D. M. Burmister unless otherwise noted.

FIGURE 5

SESI CONSULTING ENGINEERS	PROJECT NAME:	1060 Nepperhan Avenue	BORING NO.	**GB-4**
	LOCATION:	Yonkers, NY	JOB NO.	11016
	METHOD:	Mud Rotary Drilling	GROUND ELEVATION:	104 ±

BORING BY:	DATE STARTED	7/16/2020	GROUNDWATER TABLE DEPTH					
INSPECTOR:	DATE COMPLETED	7/16/2020	0 Hr.	NE	Date 7/16/20	24 Hr.	NE	Date NE

DEPTH (ft)	SAMPLE No.	REC (in)	DEPTH FROM (ft)	DEPTH TO (ft)	Blows on Spoon 0/6	6/12	12/18	18/24	N (bl/ft)	SOIL DESCRIPTION AND STRATIFICATION	Symbol USCS
40	S-13	18	40	42	3	3			7	Same as above…	
							4	4			
45	S-14	15	45	47	4	3			7	Same as above…	
							4	5			
50		0	50	52	3	5			10	No Recovery	SP
							5	5			
55	S-15	20	55	57	3	3			8	Brown fine SAND, trace Silt	
							5	6			
60	S-16	16	60	62	6	6			13	Same as above…	
							7	7			
65	S-17	9	65	66.2	25	29				Brown fine to medium GRAVEL, and fine Sand, trace Silt	GP
							50/2"			Possible bedrock encountered (Fordham Gneiss)	
										BORING COMPLETED AT 65'-2" ±	
70											
75											
80											

Nominal I.D. of Hole	in
Nominal I.D. of Split Barrel Sampler	1⅜ in
Weight/type of Hammer on Drive Pipe	300 lb
Weight/type of Hammer on Split Barrel	140 lb
Drop of Hammer on Drive Pipe	in
Core Size	in

The subsurface information shown hereon was obtained for the design and estimating purposes for our client. It is made available to authorized users only that they may have access to the same information available to our client. It is presented in good faith, but it is not intended as a substitute for investigations, interpretations or judgment of such authorized users. Information on the logs should not be relied upon without the geotechnical engineers recommendations contained in the report from which these logs were extracted.

Pp: Pocket Penetrometer; WOH: Weight of Hammer; WOR: Weight of Rod

Approximate Change in Strata: ____________ Inferred Change in Strata: _ _ _ _ _ _ _ _ _ _ _ _ _

Soil descriptions represent a field identification after D. M. Burmister unless otherwise noted.

FIGURE 5

SESI CONSULTING ENGINEERS

PROJECT NAME:	Nepperhan Ave	GEOPROBE NO.	**SB-1**
LOCATION:	Yonkers, NY	JOB NO.	11016:5
METHOD:	Direct Push	GROUND ELEVATION:	

GEOPROBE BY:	AARCO	DATE STARTED:		GROUNDWATER TABLE DEPTH: @15 feet		
INSPECTOR:	John Norgard	DATE COMPLETED:	1/8/2020	0 Hr.	24 Hr.	Date

DEPTH (ft) 0	RECOVERY (in)	SAMPLE TUBE No.	DEPTH FROM (ft)	DEPTH TO (ft)	ENVIRONMENTAL SOIL SAMPLE NAME	SOIL DESCRIPTION AND STRATIFICATION	PID
		1-5'	1			DGA gravel, 1" cyan discoloration	0
					SB-1 (0.5'-1.5')	Gray-brown, medium to fine SAND and Silt, trace fine Gravel	0
					9:20		0
							0
5	57"			5			0
10							
15							
20							
25							
30							
35							
40							

Nominal I.D. of Hole	in.
Nominal I.D. of Barrel Sampler	1⅜ in

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Pp: Pocket Penetrometer; DP: Direct Push

Approximate Change in Strata: ____________ Inferred Change in Strata: _ _ _ _ _ _ _ _ _ _ _ _ _

Soil descriptions represent a field identification after D. M. Burmister unless otherwise noted.

FIGURE 6

SESI CONSULTING ENGINEERS

PROJECT NAME:	Nepperhan Ave	GEOPROBE NO.	**SB-2**
LOCATION:	Yonkers, NY	JOB NO.	11016:5
METHOD:	Direct Push	GROUND ELEVATION:	

GEOPROBE BY:	AARCO	DATE STARTED:		GROUNDWATER TABLE DEPTH: @15 feet			
INSPECTOR:	John Norgard	DATE COMPLETED:	1/8/2020	0 Hr.		24 Hr.	Date

DEPTH (ft)	RECOVERY (in)	SAMPLE TUBE No.	DEPTH FROM (ft)	DEPTH TO (ft)	ENVIRONMENTAL SOIL SAMPLE NAME	SOIL DESCRIPTION AND STRATIFICATION	PID
0							
		1-5'	1			Black asphalt/DGA gravel	0
						Concrete & brick fragments, gray-brown medium to fine SAND, some Silt	0
					SB-2 (2'-3')	Alternating Gray-brown medium to fine SAND and light brown clayey Silt	0
					9:35		0
5	58"			5		Tan-brown medium to fine SAND, little gray-brown Silt/Clayey Silt	0
10							
15							
20							
25							
30							
35							
40							

Nominal I.D. of Hole	in.
Nominal I.D. of Barrel Sampler	1⅜ in

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Pp: Pocket Penetrometer; DP: Direct Push

Approximate Change in Strata: ____________ Inferred Change in Strata: _ _ _ _ _ _ _ _ _ _ _ _ _

Soil descriptions represent a field identification after D. M. Burmister unless otherwise noted.

FIGURE 7

SESI CONSULTING ENGINEERS

PROJECT NAME:	Nepperhan Ave	GEOPROBE NO.	**SB-3**
LOCATION:	Yonkers, NY	JOB NO.	11016:5
METHOD:	Direct Push	GROUND ELEVATION:	

GEOPROBE BY:	AARCO	DATE STARTED:		GROUNDWATER TABLE DEPTH: @15 feet		
INSPECTOR:	John Norgard	DATE COMPLETED:	1/8/2020	0 Hr.	24 Hr.	Date

DEPTH (ft) 0	RECOVERY (in)	SAMPLE TUBE No.	DEPTH FROM (ft)	DEPTH TO (ft)	ENVIRONMENTAL SOIL SAMPLE NAME	SOIL DESCRIPTION AND STRATIFICATION	PID
		1-5'	1			Black coarse to fine GRAVEL, and coarse to fine Sand	0
						Gray medium to fine SAND, some fine Gravel (Fill)	0
					SB-3 (2'-3')	Tan-brown clayey SILT with occasional 2" layer of medium to fine SAND, some Silt	0
					9:40		0
5	43"			5			0
10							
15							
20							
25							
30							
35							
40							

Nominal I.D. of Hole	in.
Nominal I.D. of Barrel Sampler	1⅜ in

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Pp: Pocket Penetrometer; DP: Direct Push

Approximate Change in Strata: ____________ Inferred Change in Strata: _ _ _ _ _ _ _ _ _ _ _ _ _

Soil descriptions represent a field identification after D. M. Burmister unless otherwise noted.

FIGURE 8

SESI CONSULTING ENGINEERS	PROJECT NAME:	Nepperhan Ave	GEOPROBE NO.	**SB-4**
	LOCATION:	Yonkers, NY	JOB NO.	11016:5
	METHOD:	Direct Push	GROUND ELEVATION:	
GEOPROBE BY: AARCO	DATE STARTED:		GROUNDWATER TABLE DEPTH: @15 feet	
INSPECTOR: John Norgard	DATE COMPLETED:	1/8/2020	0 Hr. / 24 Hr.	Date

DEPTH (ft) 0	RECOVERY (in)	SAMPLE TUBE No.	DEPTH FROM (ft)	DEPTH TO (ft)	ENVIRONMENTAL SOIL SAMPLE NAME	SOIL DESCRIPTION AND STRATIFICATION	PID
		1-5'	1			Black coarse to fine GRAVEL, and coarse to fine Sand	0
					SB-4a (1'-2')	Gray medium to fine SAND, some fine Gravel (Fill)	0
					9:50	Tan-brown clayey SILT with occasional 2" layer of tan medium to fine SAND, some Silt	0
							0
5	52"			5			0
			5				0
							0
							0
							0
10	33"			10	SB-4b (9'-10')	Olive green fine SANd and Silt, occasional root hair	0
					9:55		
15							
20							
25							
30							
35							
40							

Nominal I.D. of Hole	in.
Nominal I.D. of Barrel Sampler	1⅜ in

The subsurface information shown hereon was obtained for the design and estimating purposes for our client. It is made available to authorized users only that they may have access to the same information available to our client. It is presented in good faith, but it is not intended as a substitute for investigations, interpretations or judgment of such authorized users. Information on the logs should not be relied upon without the geotechnical engineers recommendations contained in the report from which these logs were extracted.

Pp: Pocket Penetrometer; DP: Direct Push

Approximate Change in Strata: ____________ Inferred Change in Strata: _ _ _ _ _ _ _ _ _ _ _ _ _

Soil descriptions represent a field identification after D. M. Burmister unless otherwise noted.

FIGURE 9

SESI CONSULTING ENGINEERS

PROJECT NAME:	Nepperhan Ave	GEOPROBE NO.	**SB-5**
LOCATION:	Yonkers, NY	JOB NO.	11016:5
METHOD:	Direct Push	GROUND ELEVATION:	

GEOPROBE BY:	AARCO	DATE STARTED:		GROUNDWATER TABLE DEPTH: @15 feet		
INSPECTOR:	John Norgard	DATE COMPLETED:	1/8/2020	0 Hr.	24 Hr.	Date

DEPTH (ft) 0	RECOVERY (in)	SAMPLE TUBE No.	DEPTH FROM (ft)	DEPTH TO (ft)	ENVIRONMENTAL SOIL SAMPLE NAME	SOIL DESCRIPTION AND STRATIFICATION	PID
		1-5'	1			Black to gray coarse to fine SAND, some medium to fine Gravel, little Silt (fill)	0
							0
						Tan-brown fine SAND and Silt, trace fine Gravel	0
							0
5	58"			5	SB-4 (4'-5')	Dark gray Silty CLAY, transition to medium to fine SAND, some Clayey Silt	0
					10:30		
10							
15							
20							
25							
30							
35							
40							

Nominal I.D. of Hole	in.
Nominal I.D. of Barrel Sampler	1⅜ in

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Pp: Pocket Penetrometer; DP: Direct Push

Approximate Change in Strata: ____________ Inferred Change in Strata: _ _ _ _ _ _ _ _ _ _ _ _ _

Soil descriptions represent a field identification after D. M. Burmister unless otherwise noted.

FIGURE 10

SESI CONSULTING ENGINEERS

PROJECT NAME:	Nepperhan Ave	GEOPROBE NO.	**SB-6**
LOCATION:	Yonkers, NY	JOB NO.	11016:5
METHOD:	Direct Push	GROUND ELEVATION:	

GEOPROBE BY: AARCO	DATE STARTED:		GROUNDWATER TABLE DEPTH: @15 feet			
INSPECTOR: John Norgard	DATE COMPLETED:	1/8/2020	0 Hr.		24 Hr.	Date

DEPTH (ft) 0	RECOVERY (in)	SAMPLE TUBE No.	DEPTH FROM (ft)	DEPTH TO (ft)	ENVIRONMENTAL SOIL SAMPLE NAME	SOIL DESCRIPTION AND STRATIFICATION	PID
		1-5'	1			Gray brown medium to fine SAND, some coarse to fine Gravel, little Silt (fill)	0
					SB-6 (1'-2')		0
					10:10	Brown coarse to fine SAND, little Silt, little fine Gravel	0
							0
5	47"			5		Brown tan medium to fine SAND, and a layer of Silt	0
10							
15							
20							
25							
30							
35							
40							

Nominal I.D. of Hole	in.
Nominal I.D. of Barrel Sampler	1⅜ in

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Pp: Pocket Penetrometer; DP: Direct Push

Approximate Change in Strata: ____________ Inferred Change in Strata: _ _ _ _ _ _ _ _ _ _ _ _ _

Soil descriptions represent a field identification after D. M. Burmister unless otherwise noted.

FIGURE 11

Definitions of Identification Terms for Granular Soils

Our experience has shown that the following field identification system, which is patterned somewhat after the Burmister System, permits a more detailed breakdown of the components within a soil sample than other identification systems allow. It also compels the supervising technician to examine a sample quite closely in order to accurately describe the components within the sample.

Principal Component (All Capitalized)

- GRAVEL — More than 50% of the sample by weight is Gravel
- SAND — More than 50% of the sample by weight is Sand
- SILT — More than 50% of the sample by weight is Silt

Minor Component (Proper Case)

- Gravel — Less than 50% of the sample by weight is Gravel
- Sand — Less than 50% of the sample by weight is Sand
- Silt — Less than 50% of the sample by weight is Silt

Proportion Terms

- and — Component ranges from 35% to 50% of the sample by weight
- some — Component ranges from 20% to 35% of the sample by weight
- little — Component ranges from 10% to 20% of the sample by weight
- trace — Component ranges from 0% to 10% of the sample by weight

Size of Soil Components

- Gravel
  - Coarse gravel ranges from 3 inches to 1 inch
  - Medium gravel ranges from 1 inch to 3/8 inch
  - Fine gravel ranges from 3/8 inch to No. 10 sieve
- Sand
  - Coarse sand ranges from No. 10 sieve to No. 30 sieve
  - Medium sand ranges from No. 30 sieve to No. 60 sieve
  - Fine sand ranges from No. 60 sieve to No. 200 sieve
- Silt
  - Material which passes the No. 200 sieve
- Clay
  - Material which passes the No. 200 sieve
  - Exhibits varying degrees of plasticity

Gradation Designations

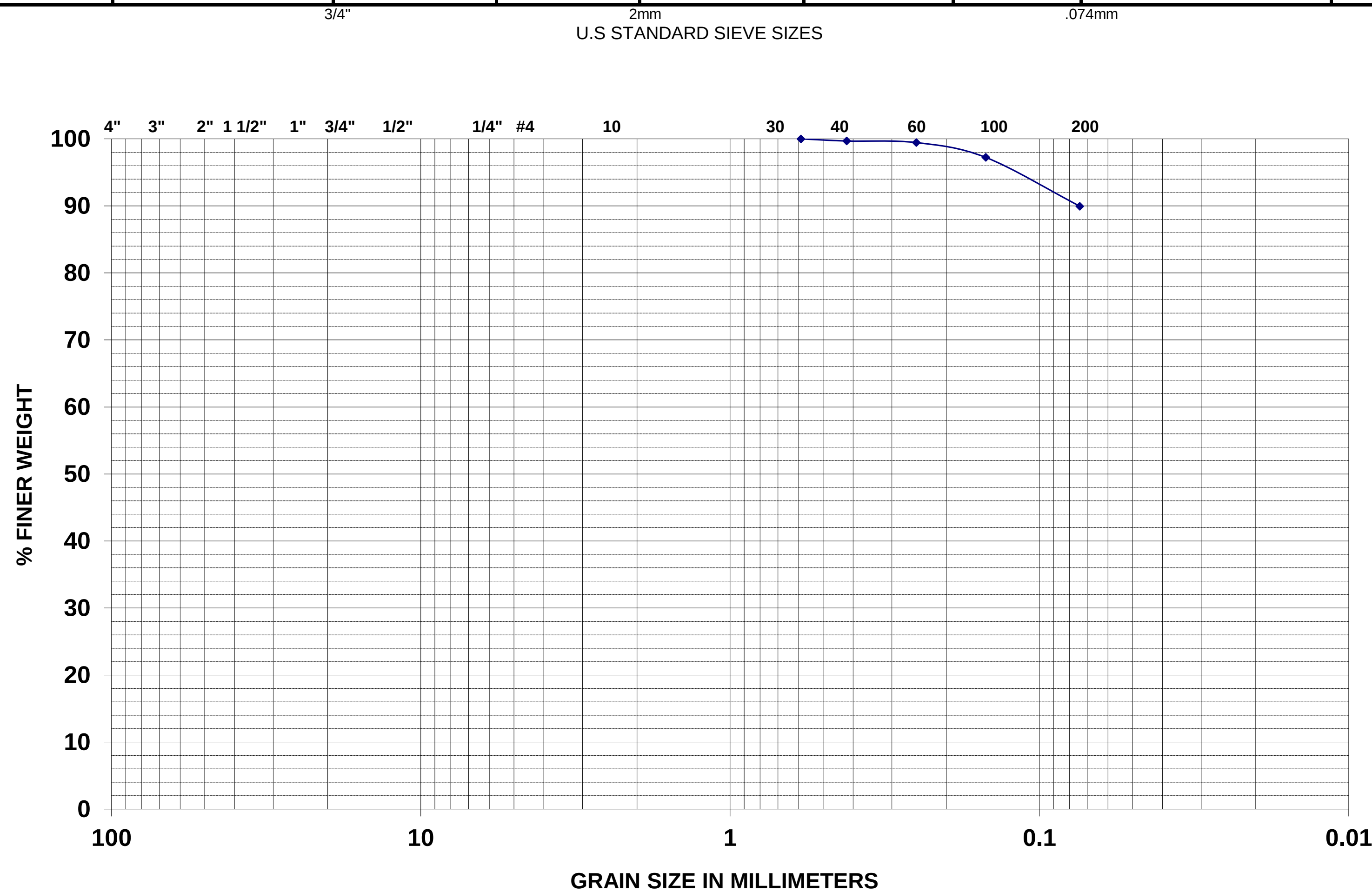
- Coarse to fine (c-f) — All fractions greater than 10%of the component
- Coarse to medium (c-m) — Less than 10% of the component is fine
- Medium to fine (m-f) — Less than 10% of the component is coarse
- Coarse (c) — Less than 10% of the component is medium and fine
- Medium (m) — Less than 10% of the component is coarse and fine
- Fine (f) — Less than 10% of the component is coarse and medium

In cases where the proportion is close to the border line between two proportions, closer identifications may be used if considered to be significant; indicated by a (+) or (-) following the proportion term.

- Plus (+) — Nearer the upper limit of the proportion
- Minus (-) — Nearer the lower limit of the proportion

Fig. 12

GRAVEL			SAND			SILT OR CLAY
COARSE	MEDIUM	FINE	COARSE	MEDIUM	FINE	



Symbol	◆	■	▲
Boring	GB-1		
Sample	S-6		
Depth	15-17'		
% +3"			
% Gravel	0.0		
% Sand	19.8		
% Fines	80.2		
% Silt			
% Clay			
Sp.G			
LL			
PL			
PI			
W (%)	28.7		

Particle Size Sieve #	Percent Finer Than		
1 in.			
3/4 in.			
1/2 in.			
1/4 in.			
4			
6			
8			
10	100.00		
30	99.68		
40	99.45		
60	97.23		
100	89.95		
200	80.22		

PARTICLE SIZE DISTRIBUTION

CLIENT: JCT Development
PROJECT: Proposed Self Storage
DATE: January 15, 2020
JOB NO. 11016 FIGURE No 13

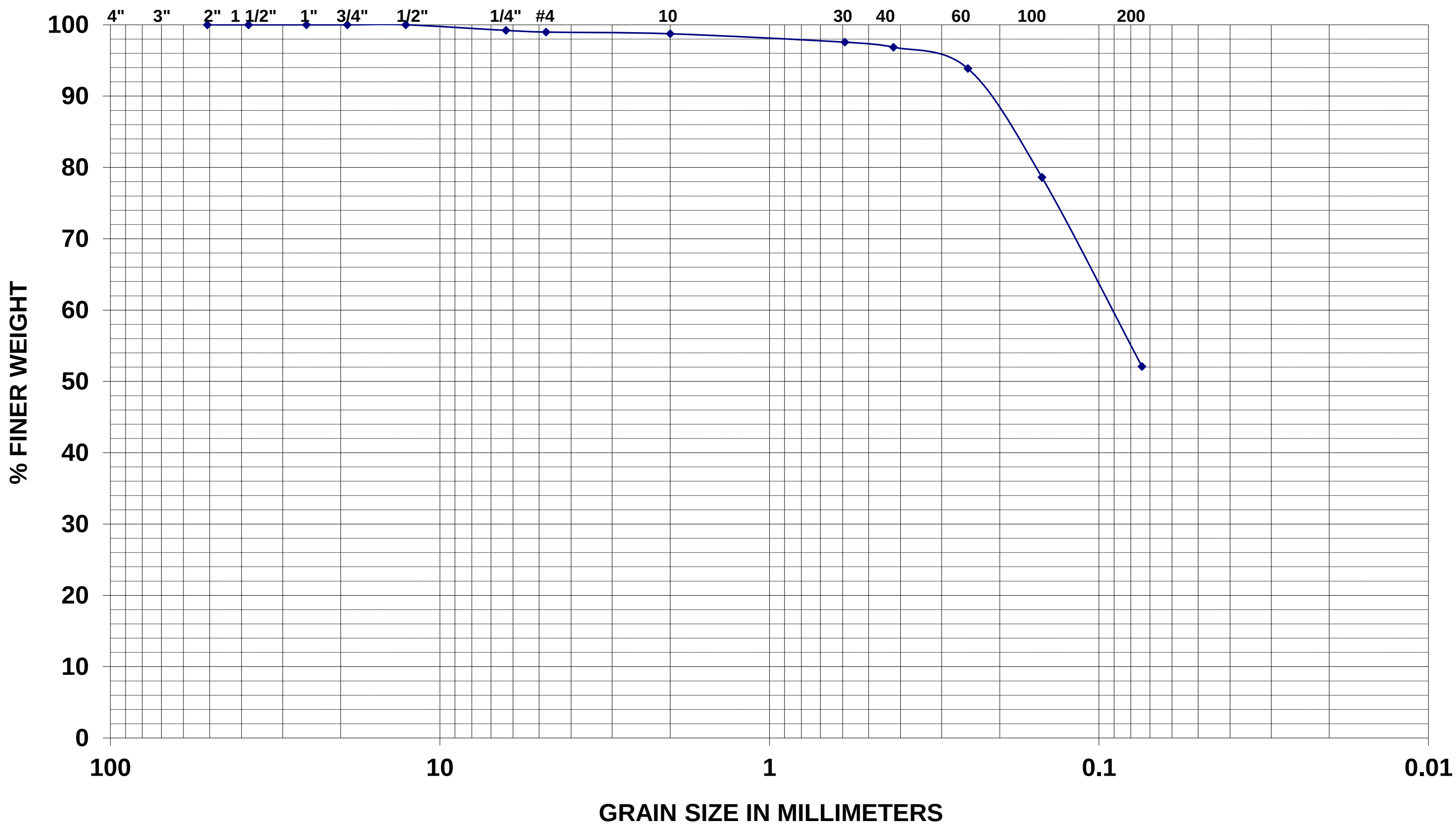
SYMBOL	DESCRIPTION AND REMARKS
◆	Gray-brown SILT, little fine Sand
■	
▲	

SESI CONSULTING ENGINEERS

GRAVEL			SAND			SILT OR CLAY
COARSE	MEDIUM	FINE	COARSE	MEDIUM	FINE	

3/4" 2mm .74mm

U.S STANDARD SIEVE SIZES



Symbol	◆
Boring	GB-1
Sample	S-9
Depth	27'-29'
% +3"	
% Gravel	1.26
% Sand	46.66
% Fines	52.08
% Silt	
% Clay	
Sp.G	
LL	
PL	
PI	
W (%)	24.4

Particle Size Sieve #	Percent Finer Than
3"	100.00
1 1/2"	100.00
1"	100.0
3/4"	100.0
1/2"	100.0
1/4"	99.2
4	99.0
10	98.7
30	97.6
40	96.9
60	93.9
100	78.6
200	52.1

PARTICLE SIZE DISTRIBUTION

CLIENT: JCT Development

PROJECT: Proposed Self Storage

DATE: January 15, 2020

JOB NO. 11016 FIGURE No 14

SYMBOL	DESCRIPTION AND REMARKS
◆	Gray-brown SILT, and medium to fine Sand

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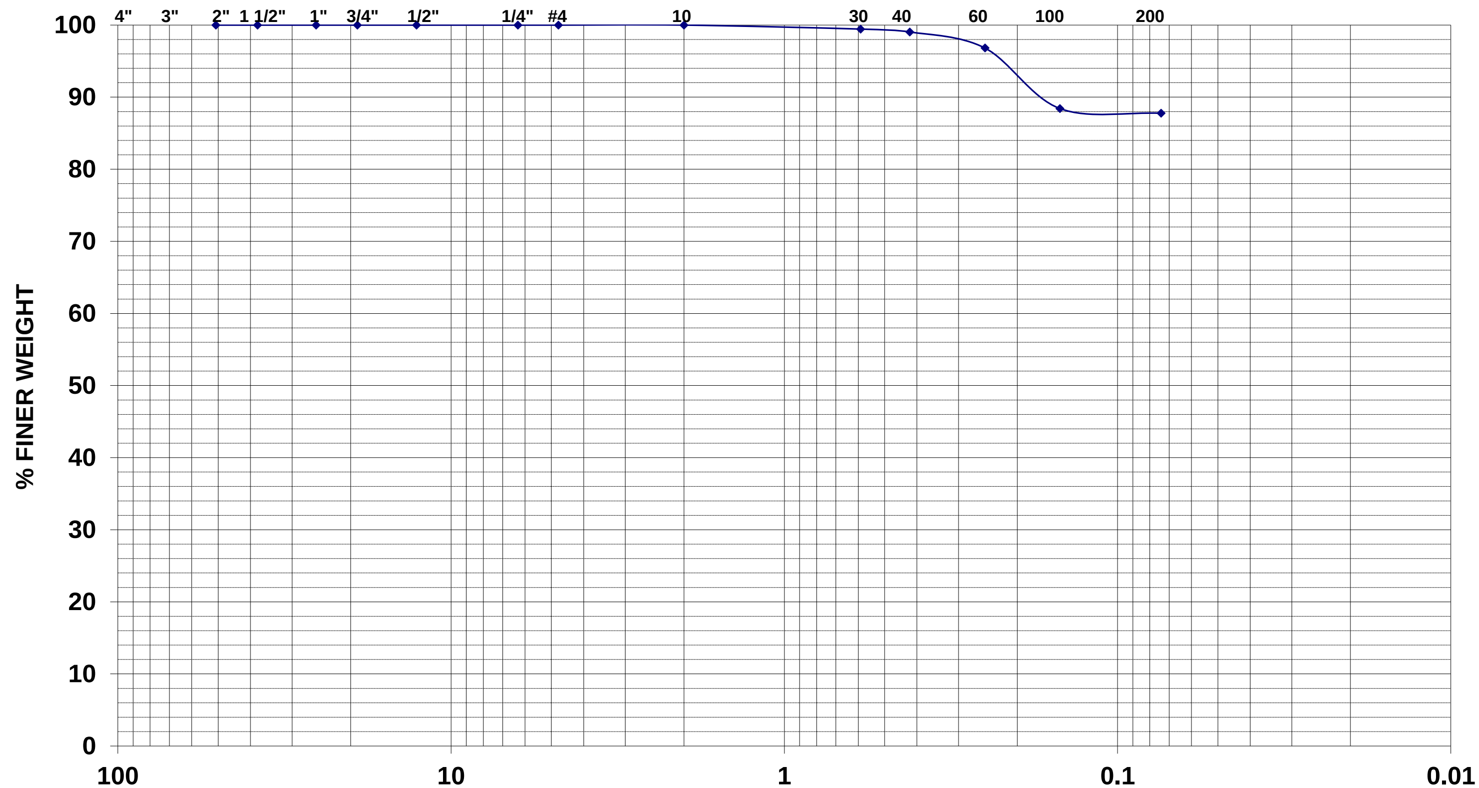
GRAVEL			SAND			SILT OR CLAY
COARSE	MEDIUM	FINE	COARSE	MEDIUM	FINE	

3/4" 2mm .74mm

U.S STANDARD SIEVE SIZES



GRAIN SIZE IN MILLIMETERS

Symbol	◆
Boring	GB-2
Sample	S-7B
Depth	20'-22'
% +3"	
% Gravel	0.00
% Sand	12.23
% Fines	87.77
% Silt	
% Clay	
Sp.G	
LL	
PL	
PI	
W (%)	29.6

Particle Size Sieve #	Percent Finer Than
3"	100.00
1 1/2"	100.00
1"	100.0
3/4"	100.0
1/2"	100.0
1/4"	100.0
4	100.0
10	100.0
30	99.4
40	99.0
60	96.8
100	88.4
200	87.8

PARTICLE SIZE DISTRIBUTION

CLIENT: JCT Development

PROJECT: Proposed Self Storage

DATE: January 15, 2020

JOB NO. 11016 FIGURE No. 15

SYMBOL	DESCRIPTION AND REMARKS
◆	Gray-brown SILT, little medium to fine Sand

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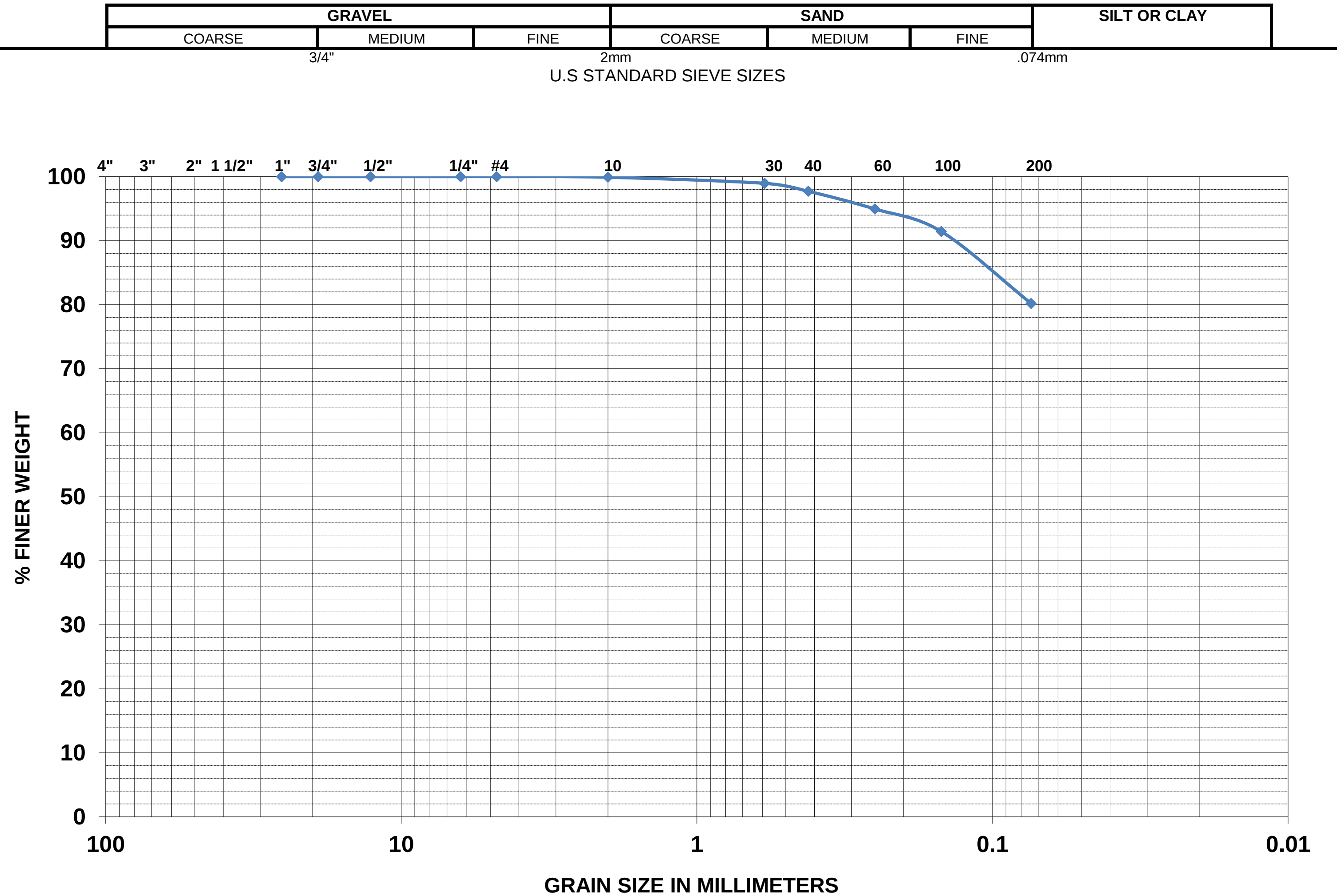

Symbol	◆	■	▲
Boring	GB-3		
Sample	S-2		
Depth	2'-4'		
% +3"			
% Gravel	0.10		
% Sand	19.71		
% Fines	80.19		
% Silt			
% Clay			
Sp.G			
LL			
PL			
PI			
W (%)	23.3%		

Particle Size Sieve #	Percent Finer Than		
3"	-		
1 1/2"	-		
1"	100.00		
3/4"	100.00		
1/2"	100.00		
1/4"	100.00		
4	100.00		
10	99.90		
30	98.95		
40	97.71		
60	94.95		
100	91.43		
200	80.19		

PARTICLE SIZE DISTRIBUTION

CLIENT: JCT Development

PROJECT: Proposed Self Storage Facility

DATE: July 23, 2020

JOB NO. 11016 FIGURE No 16

SYMBOL	DESCRIPTION AND REMARKS
◆	Brown SILT, little medium to fine Sand, trace fine Gravel
■	
▲	

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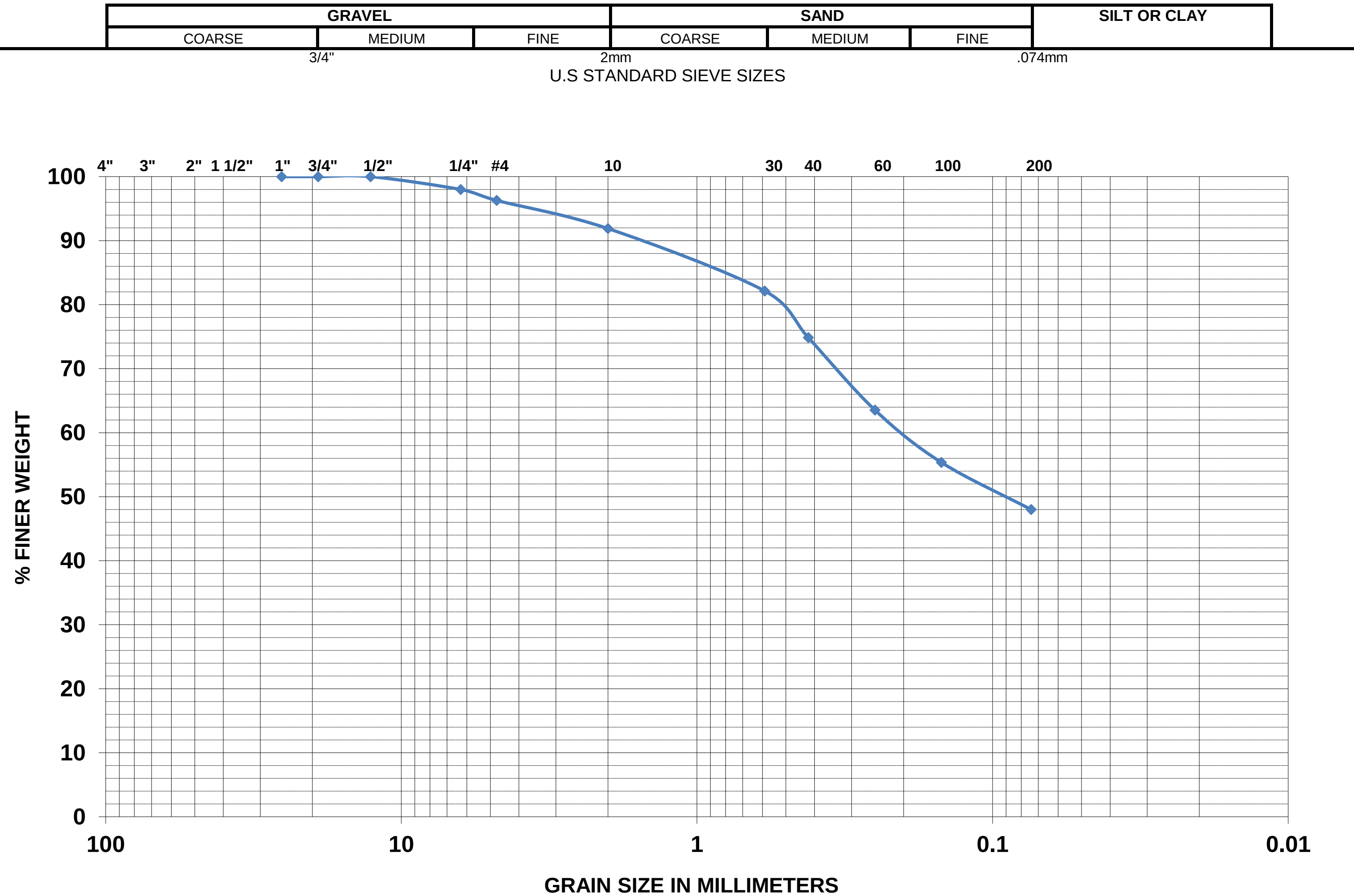

Symbol	◆	■	▲
Boring	GB-4		
Sample	S-1		
Depth	2'-4'		
% +3"			
% Gravel	8.11		
% Sand	43.90		
% Fines	47.99		
% Silt			
% Clay			
Sp.G			
LL			
PL			
PI			
W (%)	13.1%		

Particle Size Sieve #	Percent Finer Than		
3"	-		
1 1/2"	-		
1"	100.00		
3/4"	100.00		
1/2"	100.00		
1/4"	97.99		
4	96.28		
10	91.89		
30	82.14		
40	74.85		
60	63.54		
100	55.36		
200	47.99		

PARTICLE SIZE DISTRIBUTION

CLIENT: JCT Development
PROJECT: Proposed Self Storage Facility
DATE: July 23, 2020
JOB NO. 11016 FIGURE No 17

SYMBOL	DESCRIPTION AND REMARKS
◆	Brown Silt, and coarse to fine Sand, trace fine Gravel
■	
▲	

SESI CONSULTING ENGINEERS