PRELIMINARY GEOTECHNICAL ENGINEERING REPORT

PROPOSED WAREHOUSE BUILDINGS

BLOCK 200.10 LOTS 20 (PART), 32 & 33

HILLSBOROUGH TOWNSHIP, SOMERSET COUNTY, NEW JERSEY

PREPARED FOR:

MR. GLEN STOCK
STOCK DEVELOPMENT GROUP, INC.
3815 LANCASTER DRIVE
DOYLESTOWN, PA 18902

AUGUST 20, 2021

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NEW JERSEY PROFESSIONAL ENGINEER
LICENSE NUMBER GE29247

VCEA PROJECT NUMBER: 20-47-H

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EXECUTIVE SUMMARY

The following is a summary of our preliminary geotechnical engineering conclusions and recommendations based on the results of the subsurface investigation for the proposed Warehouse Buildings located along Homestead Road in Block 200.10, Lots 20 (part), 32 & 33 of Hillsborough Township, Somerset County, New Jersey. The two (2) proposed warehouse buildings vary in size from 420,250 SF to 512,500 SF.

Development of this site will prove challenging for a contractor without prior experience developing a site with silty soils. A proper work plan that minimizes the disturbance to the on-site soils needs to be in-place prior to the start of earthwork operations. Otherwise, suitable soils will become unsuitable after being disturbed and require undercutting and replacement that would not have been required if a proper work plan was in-place.

Subsurface Conditions

- A subsurface exploration program was conducted on July 19 to 21, 2021 in the areas of the proposed Warehouse Buildings and paved areas. The subsurface exploration program consisted of 27 test pits excavated to depths between 3 and 7 feet.

- The test pits revealed the presence of 6 to 18 inches of topsoil or agricultural soil (Stratum B) at the surface underlain by silty residual soils (Stratum C) to depths of approximately 1 to 5.5 feet below existing surface grades. Test pits TP-20 and TP-30 encountered fill (Stratum A) at the ground surface to depths of 3.5 to 5.5 feet. Weathered shale (Stratum D) was encountered below the fill (Stratum A) and residual soils (Stratum C) to depths of approximately 3 to 7 feet, the maximum depth explored.

- Perched groundwater seepage was encountered in test pits T-03, T-09, T-20, T-28 and T-29 at depths between 3.0 and 4.8 feet. Groundwater seepage was not encountered at any of the remaining test pit locations. However, perched groundwater is typically encountered at the top of competent bedrock where downward water migration is slowed.

Foundation & Slab On-Grade

- Shallow and spread footings for the building additions can be designed with a maximum net allowable soil bearing capacity of 3,000 psf (1.5 tsf) for the natural soils Stratum C or on compacted structural fill and 4,000 psf (2.0 tsf) for the weathered shale of Stratum D after approval by the Geotechnical Engineer. Stratums A and B are not suitable for foundation support.

- A modulus of subgrade reaction of 150 pci, based on a 1-foot square steel plate, may be used for design of concrete floor slabs.

- In accordance with the provisions of the 2018 International Building Code, New Jersey Edition Section 1613.3.2 Seismic Requirements, the design is subject to the seismic design requirements of ASCE 7 Table 20.3-1 (Site Class Definitions). The site can be classified as Class C, very dense soil and soft rock profile.

1.0 INTRODUCTION

This report presents the results of a geotechnical subsurface investigation conducted by Van Cleef Engineering Associates (VCEA) for the proposed Warehouse Buildings located along Homestead Road in Block 200.10, Lots 20 (part), 32 & 33 of Hillsborough Township, Somerset County, New Jersey. The two (2) proposed warehouse buildings vary in size from 420,250 SF to 512,500 SF. The site location is shown on the attached Site Location Plan – Figure 1, Appendix A

The purpose of this study was to determine the subsurface soil conditions beneath the site of the proposed Warehouse Buildings in order to provide geotechnical recommendations for foundation support and site development. General comments and other limitations relative to the contents of this report are presented in the Limitations Section of this report, Appendix D.

No additional construction or loading information was provided at the time this report was prepared.

2.0 SUBSURFACE INVESTIGATION PROGRAM

In order to determine the subsurface conditions at the proposed Warehouse Building locations a Wacker ET90 excavator was provided to perform the subsurface investigation from July 19 to 21, 2021. The investigation included excavating twenty-seven (27) geotechnical test pits. These test pits are identified as T-01 through T-30. The test pits were excavated to a maximum depth of 7 feet below the existing ground surface. It should be noted that test pit locations T-17, T-21 and T-26 were either inaccessible or located too close to the gas pipeline easement and were not performed. The test pit locations are shown on the attached Test Pit Location Plan – Figure 2, Appendix A.

During the execution of the test pits, a representative from VCEA was present to monitor the excavation, prepare test pit logs, and record all pertinent data. Detailed logs are presented in Appendix B of this report. General notes for the test pit logs are included in Appendix B.

3.0 GENERAL SITE GEOLOGY

According to the Engineering Soil Survey of New Jersey, Report Number 7, Somerset County the site is located in Sh-4, Shale bedrock with some interbedded sandstone. This consists of soft shale, with occasional interstratified beds of fine grained sandstone, all dipping to the northwest. The shale breaks easily into small fragments ¼" to 1-11/2" in size. The depth to weathered bedrock is 2 to 6 feet and increases in strength with depth. The overlying soil consists of silts with silty clay.

4.0 DESCRIPTION OF SUBSURFACE CONDITIONS

Based on the results of the test pits, the generalized subsurface conditions at this site may be described as follows, in order of depth:

Stratum A – Fill: Stratum A was encountered at the ground in test pits T-20 and T-30 and extends to depths of approximately 3.5 to 5.5 feet below the existing ground surface. Stratum

A was not encountered in the remaining test pit locations. The material consists primarily of red brown to black silt with varying amounts of sand, gravel, debris. Debris mixed with trash bags was encountered at a depth of 5 feet in test pit T-20. Bucket resistance during excavation indicated a soft consistency. Stratum D underlies this stratum in test pits T-20 and T-30.

Stratum B – Topsoil/Agricultural Soil: Stratum B was encountered at the ground surface at all test pit locations (except T-20 and T-30) and extends to a depths of approximately 0.5 to 1.5 feet below the existing ground surface. The material consists of either topsoil or agricultural soils and was identified as such in the test pit logs. Bucket resistance during excavation indicated a soft consistency. Stratum C in turn underlies this stratum.

Stratum C – Residual Soil: Derived from the in-place chemical and physical weathering of the underlying shale bedrock. Stratum C was encountered directly below Stratum B at all test pit locations (except T-20 and T-30). Stratum C extends to a depths of approximately 1 to 5.5 feet below the existing ground surface. The material consists primarily of tan to reddish brown Silt (ML per USCS) with varying amounts of sand and shale fragments. Bucket resistance during excavation indicated a medium stiff condition. Stratum D in turn underlies this stratum.

Stratum D –Weathered Shale: This stratum consists of very stiff, red-brown, ripable layers of soft or fractured shale bedrock. Bucket resistance during excavation indicated a stiff to very stiff condition with resistance increasing with depth. This stratum extends to depths of approximately 3 to 7 feet, the maximum depth explored. Bucket refusal on competent bedrock of the Passaic Formation was encountered at all test pit locations.

5.0 GROUNDWATER CONDITION

Perched groundwater seepage was encountered in test pits T-03, T-09, T-20, T-28 and T-29 at depths between 3.0 and 4.8 feet. Perched groundwater is typically encountered at the top of competent bedrock where downward water migration is slowed. Groundwater seepage was not observed at the remaining test pit locations.

Soil moisture and groundwater conditions should be expected to fluctuate with season, precipitation amounts, and other on-site and off-site factors including site utilization. Groundwater seepage may be encountered during earthwork excavation, utility installation or other deep excavations.

6.0 GEOTECHNICAL LABORATORY TESTING

Once the test borings are performed, unconfined compression testing will be performed to determine the rock strength and ripability.

7.0 FOUNDATION RECOMMENDATIONS

Test pit data revealed that the subsurface conditions are favorable for the proposed construction.

7.1 SHALLOW FOUNDATION

Conventional spread and strip footings may be designed for a maximum net allowable soil bearing pressure of 3,000 psf (1.5 tsf) for the natural silty soils of Stratum C compacted structural fill and 4,000 psf (2.0 tsf) for the weathered shale Stratum D. The soft soils of Stratum A and B are not considered suitable for foundation support and should be excavated and replaced with structural fill within the building and paved areas. See Section 8.5 - Compacted Structural Fill of this report for further details.

Footings may be stepped up or down at 2H:1V to achieve any necessary grade changes. Actual footing grades should be evaluated in the field based on observation and probing by the Geotechnical Engineer. A 12-inch cushion consisting of crushed stone should be utilized on top of weathered/fractured bedrock or bedrock if adjacent footings are founded on soil in order to have similar movements in all footings.

Wall and column footing widths should not be less than 1.5 and 3.0 feet, respectively, or less than applicable code requirements, whichever is greater. Exterior footings, and footings in unheated areas, should be founded at a minimum depth of 3.0 feet below the outside finished grades for frost protection. Interior footings can be founded at a convenient depth provided that a minimum 4-inch thick layer of clean crushed stone separates the bottom of the floor slab and the top of the concrete footings. Footings may be stepped up or down at 2H:1V to achieve any necessary grade changes.

The bottom of the excavation will consist of silty cohesive like material, and if the excavation is to be left open overnight, a work mat may be used to protect the foundation subgrade at the bottom of footing excavations. Installation of the work mat should be as directed by the Geotechnical Engineer. A work mat may consist of a 2-inch lean concrete mud mat, or 6 inches clean crushed stone, which will serve to level the footing subgrade, as well as to prevent subgrade softening if the subgrade is exposed to the elements for prolonged periods.

To confirm the design allowable soil bearing pressure, a Geotechnical Engineer prior to the placement of concrete should inspect the footing subgrade. The contractor should exercise extreme caution not to disturb the subgrade soils. Should the footing subgrade be disturbed, the loosened soil should be compacted in-place. Backfilling against footings and under floor slabs should be accomplished using structural fill placed and compacted under engineering inspection. Any water that accumulates in the bottom of the excavation should be removed within 24 hours.

7.2 AT-GRADE FLOOR SLABS

The at-grade floor slabs of the proposed Warehouse Buildings may be supported on the proofrolled soils of Stratum C, Stratum D, or compacted structural fill following subgrade preparation as specified in Section 8.1 – Subgrade Preparation Procedures of this report.

Saw joints or construction joints should isolate each bay to control shrinkage cracks. A minimum of 6 inches of ¾-inch clean, crushed stone or a 12-inch thick layer (minimum) of well-graded sand and gravel with no more than 10% non-plastic fines is recommended below the slab-on-grade to assure uniform curing conditions. A 6-mil PVC vapor retarder may be placed between the slab and base course to minimize moisture migration to the surface.

All structural fill supporting the floor slab should be compacted to 95% of the Modified Proctor Density (ASTM D 1557). A modulus of subgrade reaction of 150 pci, based on a 1-foot square steel plate, may be used for design of concrete floor slabs.

7.3 ROCK EXCAVATION

Weathered shale was encountered in all the test pit locations at approximately 1 to 5.5 feet below the existing surface grade elevations. Bucket refusal on bedrock was encountered in all of the excavations at depths between 3 to 7 feet below the existing ground surface. Considering the excavation depths required for the proposed construction, rock excavation may be required. If hard rock is encountered in localized areas during construction, VCEA believes that a “hoe-ram” could be used to facilitate excavation. It is prudent to have a line item in the bid document for rock excavations. VCEA is including the following rock definition for your use:

> "Rock is defined as any material which cannot be dislodged by a D-8 Caterpillar tractor, or equivalent, equipped with a hydraulically operated power ripper or by a CAT 235 hydraulic backhoe or equivalent without the use of extraordinary rock excavation techniques. Boulders or masses of rock exceeding 1-cubic yard in volume shall also be considered rock excavation. This classification does not include materials such as decomposed rock, concrete or other materials that can be removed by conventional rock excavation techniques, but which for reasons of economy in excavating the Contractor chooses to remove by extraordinary rock excavation techniques."

Additionally, blasting may be a viable option. VCEA recommends that any blasting be performed by a qualified blaster licensed in the State of New Jersey and be in compliance with all local and state ordinances. It is further recommended that a precondition survey of all surrounding structures be performed prior to blasting and that a vibration monitoring and control program be implemented during all blasting operations.

7.4 SETTLEMENT

VCEA estimates that post construction settlement for foundations supported on the natural soils of Stratum C or Stratum D, or compacted structural fill and constructed in accordance with VCEA’s recommendations will be 1/2-inch or less, and estimated post construction differential settlement will be minimal.

7.5 SEISMIC COEFFICIENTS

In accordance with the provisions of the 2018 International Building Code, New Jersey Edition Section 1613.3.2 Seismic Requirements, the design is subject to the seismic design requirements of ASCE 7 Table 20.3-1 (Site Class Definitions). The site can be classified as Class C, very dense soil and soft rock profile.

7.6 LATERAL EARTH PRESSURES

The following soil parameters can be used to determine lateral earth pressure for design of below grade and retaining walls assuming a SM or better quality material in accordance with ASTM D2487 is utilized as backfill. At-rest earth pressure (K_o) should be used for design of non-yielding walls.

Soil Parameters
Total unit weight γ_T = 130 pcf
Angle of internal friction ϕ = 32°
Active earth pressure K_a = 0.31
Passive earth pressure K_p = 1.6 *
At rest earth pressure K_o = 0.47
Base friction coefficient = 0.30

Note: * Includes a factor of safety equal to 2.0

Base friction can be increased to 0.4 if a layer of crushed stone, 6 inches in thickness, is placed between the concrete footing and soil subgrade.

The Geotechnical Engineer predicates the use of the above parameters upon the assumption that backfill within 5 feet of the wall will consist of structural type fill and/or predominantly granular on-site blended material, as approved. Fill placed within this 5-foot zone should be compacted with hand or plate tampers. No heavy rollers should be allowed within 5 feet of any structure.

The recommended lateral pressure does not include hydrostatic pressure since the water table is below the recommended footing elevation. To prevent water development behind any retaining walls, a permanent subdrain should be provided behind the perimeter of below grade retaining walls in accordance with the manufacturers requirements. The drain should be a continuous perforated 4-inch diameter pipe surrounded on all sides by a minimum of 6 inches of clean crushed stone wrapped in filter fabric. The pipe should be sloped to drain by gravity to the storm sewer system.

Furthermore, no surcharge loads adjacent to the walls or at the ground surface were considered in the recommended lateral pressures above. VCEA recommends adding a uniform (i.e., rectangular) lateral pressure distribution of 0.40 times the surcharge load to the lateral earth pressure distribution. The factor of 0.40 takes into account the

increase in lateral force due to dynamic loading. The Structural Engineer should determine the magnitude of the surcharge loads (i.e., live loads).

8.0 SITE DEVELOPMENT CONSIDERATIONS

Development of this site will prove challenging for a contractor without prior experience developing a site with underlying silty soils. A proper work plan that minimizes the disturbance to the on-site soils needs to be in-place prior to the start of earthwork operations. Otherwise, suitable soils will become unsuitable after being disturbed and require undercutting and replacement that would not have been required if a proper work plan was in-place.

8.1 SUBGRADE PREPARATION PROCEDURES

The subgrade preparation procedures will include:

- Remove trees, vegetation and strip topsoil / agricultural soil within the building and parking areas and 5 feet beyond the proposed footprints;
- Grade site to proposed subgrade elevation(s) through. Use only track-mounted equipment on the native soils, as they will soften under vehicle traffic and exposure to weather. Do not leave the soil subgrade exposed to wet weather for extended periods;
- The exposed subgrade soils should be proofrolled and compacted using a heavy duty 10-ton drum roller or fully loaded triaxle dump truck;
- Any areas which exhibit signs of instability during the compaction operations or contain excessive unsuitable materials, as determined by the Geotechnical Engineer, should be selectively over-excavated to suitable bearing material and backfilled with approved compacted structural fill;
- The excavated soil may be reused as the structural fill following removal of oversized material. Fractured bedrock may be utilized as structural fill following processing with a rock crusher at a 3-inch minus or less screen. Upon completion of proofrolling, structural fill can be placed and compacted to the design subgrade;
- All structural fill should be compacted to 95% of the Modified Proctor Density (ASTM D 1557); and
- The subgrade preparation procedures should be under the supervision of a Geotechnical Engineer.

8.2 EXCAVATION AND BACKFILL

A Geotechnical Engineer shall inspect the footing subgrade prior to the placement of concrete to confirm the design allowable soil bearing pressure, verify that the existing

fill is excavated, and any soft soil conditions encountered are stabilized. Once excavated, the exposed footing subgrade should be thoroughly compacted utilizing a mechanical compactor such as a "jumping jack" or similar device as specified by the Geotechnical Engineer. The contractor should exercise extreme caution not to disturb the subgrade soils. Should the footing subgrade be disturbed or soft soils encountered, the unsuitable soil should be over-excavated to firm soils and replaced with appropriate compacted structural fill.

Backfilling against footings and under floor slabs should be accomplished using structural fill placed and compacted under Geotechnical Engineering inspection. Any water that accumulates in the bottom of the excavation should be removed within 24 hours.

All excavation operations and backfill requirements shall be performed in accordance with requirements discussed in Section 8.1 – Subgrade Preparation Procedures.

8.3 SITE DRAINAGE AND SURFACE WATER CONTROL

Adequate temporary and permanent control of surface water runoff and subsurface seepage will be required in order to allow site access, grading, and foundation and underground utility construction to proceed. Excavation, filling, subgrade, and grade preparation should be performed in a manner and sequence that will provide drainage at all times and proper control of erosion. Surface water should be pumped or drained to provide a suitable working platform. Any water accumulating in the open excavation should be removed within 24 hours. Ponding of water shall not be permitted. Site grades during construction shall be maintained to allow positive drainage and minimize ponding.

8.4 EXISTING UTILITIES

All existing underground utilities should be relocated within the proposed building construction areas because it is not practical to perform corrective actions once the building is constructed. In particular large diameter piping (greater than 4 inches in diameter) provide a possible means for soil movement beneath the building. Those utilities, which are not to be reused, should be removed from and within 5 feet beyond the proposed construction area.

The utility trenches that are in the influence zone of new construction should be backfilled with compacted structural fill. A structural engineer should evaluate underground utilities, which are to be reused. A Geotechnical Engineer should evaluate the suitability of the utility backfill for support of the planned construction. Existing utilities that are to be preserved shall require grading operations to be performed in a manner so as not to disturb or damage the existing utility.

8.5 COMPACTED STRUCTURAL FILL

Before placement of new fills, or construction of foundations on natural soils, all vegetation and any miscellaneous debris shall be removed. Any unsuitable soils thus detected should be excavated and replaced with compacted granular fill (SM or better).

The on-site excavated soils are generally considered suitable for use as fill. It should be anticipated that some drying and reworking of the on-site soils will be necessary to achieve the required compaction as outlined below. The encountered upper on-site materials are sandy, but these sandy soils are underlain by clayey soils and as such will not dry readily when wet. Moisture control by drying or mixing with a dry material is vital to success of using this material as backfill soils. Controlled fill shall consist of inorganic, readily compactable, predominantly well graded, granular soils with no more than 15% fines (material passing through the No. 200 sieve). Off-site borrow, if required, should meet Unified Soil Classification System (USCS) designation ML, SM, SP, GP, GM, GW and be approved by the Geotechnical Engineer prior to use.

It is recommended that fragments having a maximum dimension greater than 3 inches be excluded from the fill or processed by means of a rock crusher using a 3-inch minus screen. The moisture content of the fill materials should be controlled to within 3% of the optimum by wetting, aeration or blending to facilitate compaction.

All load-bearing fill should be controlled fill. Controlled fill should be placed in loose horizontal lifts with a maximum thickness of 8 inches. It is recommended that controlled fill within the construction area be compacted with a heavy duty 10-ton roller to at least 95% of the maximum dry density as determined by the Modified Proctor Test (ASTM D 1557). In addition, VCEA recommends that all fills be stable without significant movement under construction traffic, as judged by the Geotechnical Engineer. Quality control testing of in-place fill densities should be conducted throughout the entire earthwork operation.

Compaction within 5 feet from any existing structures should be conducted using a light compactor such as a “Jumping Jack” in order not to cause any damage. The soil should be compacted to the same criteria described above.

8.6 EXCAVATION SUPPORT CONSIDERATIONS

It should be stated in the contract document that the contractor is responsible for maintaining the integrity of the existing above-grade and below-grade structures. All construction excavations should be performed in conformance with applicable local, state and federal OSHA safety regulations.

The design of all temporary excavation support systems should be the responsibility of a licensed New Jersey Professional Engineer retained by the foundation contractor. All excavations of temporary support systems should conform to pertinent OSHA and local safety regulations. The Owner’s geotechnical engineer prior to construction of the temporary support structures should review the design of soil loads.

Movement of workmen and construction machinery across the bottom of the excavation (footing subgrade) could disturb the subgrade soil. If the subgrade soil is disturbed, the disturbed soil should be removed and backfilled with gravel as directed by the engineer.

Regardless of the excavation option chosen, excavated soils should not be stockpiled adjacent to the sides of the excavations to avoid the imposition of additional loads, unless temporary shoring or side slopes are designed for such a surcharge load.

8.7 CONSTRUCTION DEWATERING

Groundwater seepage was encountered in test pits T-03, T-09, T-20, T-28 and T-29 at depths between 3.0 and 4.8 feet. Additionally, perched groundwater is typically encountered at the top of competent bedrock where downward water migration is slowed. Therefore, perched water may be encountered during excavation and construction. Due to the possibility of encountering perched water during construction, a dewatering system using sump pits and sump pumps may be necessary. Dewatering specifications shall be of the performance type requiring the contractor to lower the water level a minimum of two (2) feet below prevailing depths of excavations. Any water accumulating in the bottom of excavations shall be removed within 24 hours.

9.0 CONSTRUCTION OBSERVATION AND TESTING

Regardless of the thoroughness of a geotechnical engineering exploration, there is always a possibility that conditions between the borings and below the depths explored may be different from those encountered in the borings, that conditions are not as anticipated by the designers, or that the construction process has altered the subsurface conditions. Therefore, geotechnical engineering construction observation on a full time basis should be performed under the supervision of a Geotechnical Engineer who is familiar with the intent of the recommendations presented herein. This observation is recommended to evaluate whether the conditions anticipated in the design actually exist or whether the recommendations presented herein should be modified where necessary.

10.0 GENERAL

The conclusions and recommendations of this report are based on the information revealed by this exploration. An attempt has been made to provide for normal contingencies, but the possibility remains that unexpected conditions may be encountered during construction. An allowance should be established to account for possible additional costs that may be required to construct foundations and earthwork as recommended herein. Additional costs may be incurred for various reasons including undercutting of unsuitable soils, inability to use on-site soils due to the weather conditions during the period earthwork proceeds, and variation of soil between borings.

This study should be made available to prospective bidders for informational purposes. VCEA recommends that the project specifications contain the following statement:

"A geotechnical engineering report has been prepared for this project by VCEA. This report is for informational purposes only and should not be considered part of the

contract documents. The opinions expressed in this report are those of the Geotechnical Engineer and represent VCEA's interpretation of the subsoil conditions, and the results of analyses, which have been conducted. Should the data contained in this report not be adequate for the Contractor's purposes, the Contractor may make their own investigation, tests, and analyses at their own cost prior to bidding. This report may be examined by bidders."

VCEA strongly advises that the Subsurface Exploration Data of all Appendices should be included in the contract documents.

APPENDIX A

FIGURE 1	Site Location Plan
Proposed Warehouses **Block 200.10, Lots 20 (part), 32 & 33** **Hillsborough Twp., Somerset County, NJ**	Van Cleef ENGINEERING ASSOCIATES, LLC

SCALE	DATE	DRAWN BY	FILE NO.
Not to Scale	August 2021	ETD	20-47-H

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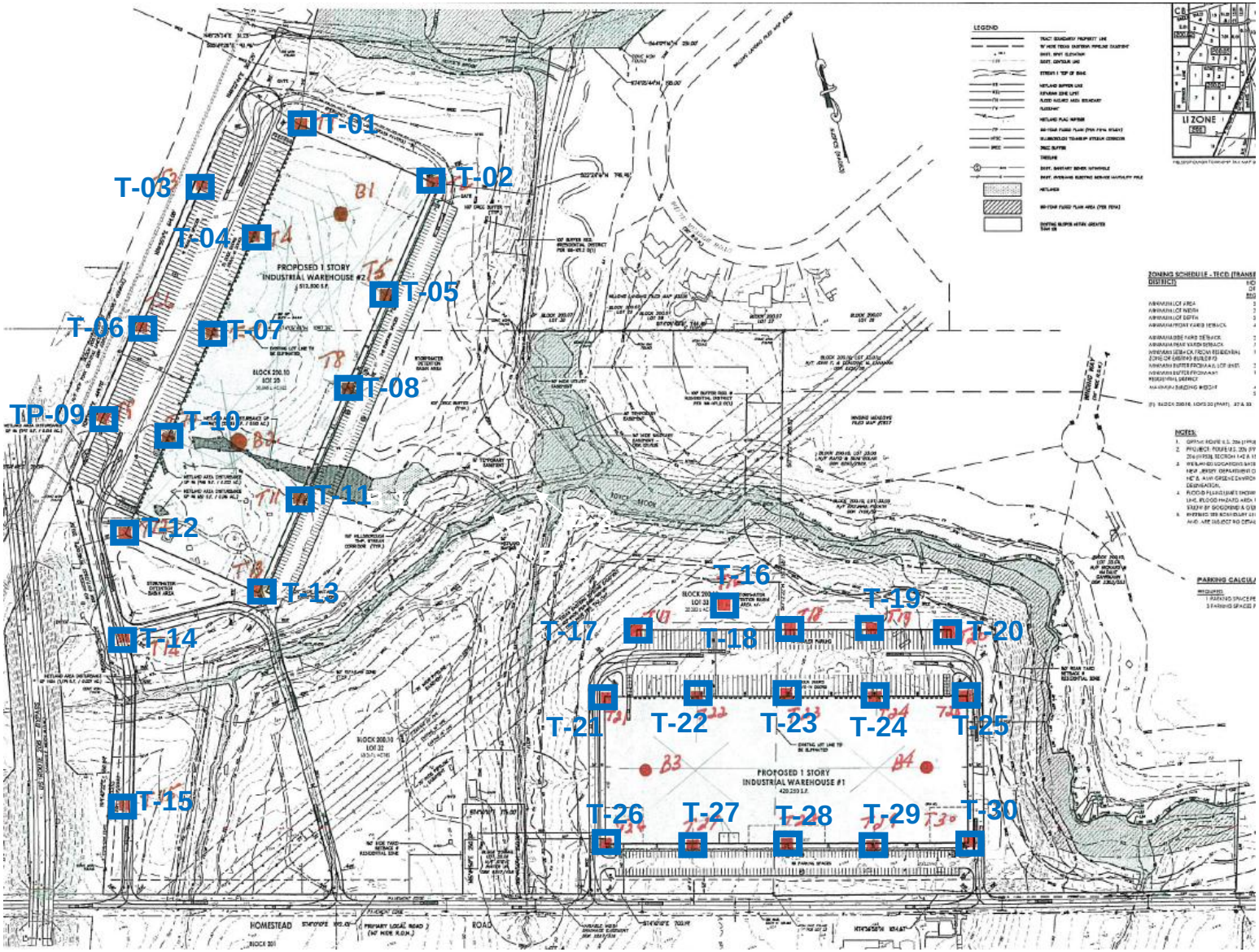

Figure 2	TEST PIT LOCATION PLAN			
Proposed Warehouses **Block 200.10, Lots 20 (part), 32 & 33** **Hillsborough Twp., Somerset County, New Jersey**	Van Cleef ENGINEERING ASSOCIATES, LLC			
LEGEND **T-01 = Test Pit Location**	SCALE	DATE	DRAWN BY	FILE NO.
	Not to Scale	August 2021	ETD	20-47-H

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APPENDIX B

TEST PIT LOG

Test Pit # T-01

Dates: Started: 7/21/2021 **Completed:** 7/21/2021
Time: Started: **Completed:**
Groundwater Encountered: N/E feet
Groundwater Notations:
Encountered: Time: **Elevation:** ±
Completed: Time: **Elevation:** ±
Weather: Clear **Temperature:** 80-85F°
Excavation Equipment: Wacker ET90
Backfilled Upon Completion: YES

Van Cleef ENGINEERING ASSOCIATES, LLC

Project: Proposed Warehouses
Project Number: 20-47-H
Project Location: Block 200, Lots 20 (part), 32 & 33 Hillsborough Twp, Somerset Co, NJ
VCEA Representative: E. DeRicco
Test Pit Location: See Test Pit Location Plan
Ground Surface Elevation (ft): ± 72

Depth (ft)	STRATUM	Graphic Symbol	MATERIAL DESCRIPTION	Elevation	REMARKS
0	B		12 inches Agricultural soil.	72	AGRICULTURAL SOIL
1	C		Red brown SILT, little coarse to fine Sand, trace coarse to fine Gravel (Shale Fragments). (ML)	71	RESIDUAL
2	D		Red brown Weathered SHALE.	70	WEATHERED SHALE
4			Bottom of Test Pit at 4.2'	68	Bucket refusal @ 4.2 FT
5				67	
6				66	
7				65	
8				64	

TEST PIT LOG

Test Pit # T-02

Dates: Started: 7/21/2021 **Completed:** 7/21/2021
Time: Started: **Completed:**
Groundwater Encountered: N/E feet
Groundwater Notations:
Encountered: Time: **Elevation:** ±
Completed: Time: **Elevation:** ±
Weather: Clear **Temperature:** 80-85F°
Excavation Equipment: Wacker ET90
Backfilled Upon Completion: YES

Van Cleef ENGINEERING ASSOCIATES, LLC

Project: Proposed Warehouses
Project Number: 20-47-H
Project Location: Block 200, Lots 20 (part), 32 & 33 Hillsborough Twp, Somerset Co, NJ
VCEA Representative: E. DeRicco
Test Pit Location: See Test Pit Location Plan
Ground Surface Elevation (ft): ± 80

Depth (ft)	STRATUM	Graphic Symbol	MATERIAL DESCRIPTION	Elevation	REMARKS
0	B		12 inches Agricultural soil.		AGRICULTURAL SOIL
1	C		Red brown SILT, little coarse to fine Sand, trace coarse to fine Gravel (Shale Fragments). (ML)	79	RESIDUAL
2	D		Red brown Weathered SHALE.	78	WEATHERED SHALE
3			Bottom of Test Pit at 3.4'	77	Bucket refusal @ 3.4 FT
4				76	
5				75	
6				74	
7				73	
8				72	

TEST PIT LOG

Test Pit # T-03

Dates: Started: 7/21/2021 **Completed:** 7/21/2021
Time: Started: **Completed:**
Groundwater Encountered: 3.0 feet
Groundwater Notations:
Encountered: Time: **Elevation:** 83 ±
Completed: Time: **Elevation:** ±
Weather: Clear **Temperature:** 80-85F°
Excavation Equipment: Wacker ET90
Backfilled Upon Completion: YES

Van Cleef ENGINEERING ASSOCIATES, LLC

Project: Proposed Warehouses
Project Number: 20-47-H
Project Location: Block 200, Lots 20 (part), 32 & 33 Hillsborough Twp, Somerset Co, NJ
VCEA Representative: E. DeRicco
Test Pit Location: See Test Pit Location Plan
Ground Surface Elevation (ft): ± 86

Depth (ft)	STRATUM	Graphic Symbol	MATERIAL DESCRIPTION	Elevation	REMARKS
0	B		12 inches Agricultural soil.		AGRICULTURAL SOIL
1				85	
2	C		Red brown SILT, little coarse to fine Sand, trace coarse to fine Gravel (Shale Fragments). (ML)	84	RESIDUAL
3				83	Seepage @ 3.0 FT
4	D		Red brown Weathered SHALE.	82	WEATHERED SHALE
5				81	
			Bottom of Test Pit at 5.5'		Bucket refusal @ 5.5 FT
6				80	
7				79	
8				78	

TEST PIT LOG

Test Pit # T-04

Dates: Started: 7/21/2021 **Completed:** 7/21/2021
Time: Started: **Completed:**
Groundwater Encountered: N/E feet
Groundwater Notations:
Encountered: Time: **Elevation:** ±
Completed: Time: **Elevation:** ±
Weather: Clear **Temperature:** 80-85F°
Excavation Equipment: Wacker ET90
Backfilled Upon Completion: YES

Van Cleef ENGINEERING ASSOCIATES, LLC

Project: Proposed Warehouses
Project Number: 20-47-H
Project Location: Block 200, Lots 20 (part), 32 & 33 Hillsborough Twp, Somerset Co, NJ
VCEA Representative: E. DeRicco
Test Pit Location: See Test Pit Location Plan
Ground Surface Elevation (ft): ± 92

Depth (ft)	STRATUM	Graphic Symbol	MATERIAL DESCRIPTION	Elevation	REMARKS
1	B		18 inches Agricultural soil.	91	AGRICULTURAL SOIL
2	C		Red brown SILT, little coarse to fine Sand, trace coarse to fine Gravel (Shale Fragments). (ML)	90	RESIDUAL
3	D		Red brown Weathered SHALE.	89	WEATHERED SHALE
4				88	
			Bottom of Test Pit at 4.5'		Bucket refusal @ 4.5 FT
5				87	
6				86	
7				85	
8				84	

TEST PIT LOG

Test Pit # T-05

Dates: Started: 7/20/2021 **Completed:** 7/20/2021
Time: Started: **Completed:**
Groundwater Encountered: N/E feet
Groundwater Notations:
Encountered: Time: **Elevation:** ±
Completed: Time: **Elevation:** ±
Weather: Clear **Temperature:** 80-85F°
Excavation Equipment: Wacker ET90
Backfilled Upon Completion: YES

Van Cleef ENGINEERING ASSOCIATES, LLC

Project: Proposed Warehouses
Project Number: 20-47-H
Project Location: Block 200, Lots 20 (part), 32 & 33 Hillsborough Twp, Somerset Co, NJ
VCEA Representative: E. DeRicco
Test Pit Location: See Test Pit Location Plan
Ground Surface Elevation (ft): ± 80

Depth (ft)	STRATUM	Graphic Symbol	MATERIAL DESCRIPTION	Elevation	REMARKS
	B		12 inches Agricultural soil.		AGRICULTURAL SOIL
1				79	
	C		Red brown SILT, little coarse to fine Sand, trace coarse to fine Gravel (Shale Fragments). (ML)		RESIDUAL
2				78	
3				77	
	D		Red brown Weathered SHALE.		WEATHERED SHALE
4				76	
			Bottom of Test Pit at 4.5'		Bucket refusal @ 4.5 FT
5				75	
6				74	
7				73	
8				72	

TEST PIT LOG

Test Pit # T-06

Dates: Started: 7/20/2021 **Completed:** 7/20/2021
Time: Started: **Completed:**
Groundwater Encountered: N/E feet
Groundwater Notations:
Encountered: Time: **Elevation:** ±
Completed: Time: **Elevation:** ±
Weather: Clear **Temperature:** 80-85F°
Excavation Equipment: Wacker ET90
Backfilled Upon Completion: YES

Van Cleef ENGINEERING ASSOCIATES, LLC

Project: Proposed Warehouses
Project Number: 20-47-H
Project Location: Block 200, Lots 20 (part), 32 & 33 Hillsborough Twp, Somerset Co, NJ
VCEA Representative: E. DeRicco
Test Pit Location: See Test Pit Location Plan
Ground Surface Elevation (ft): ± 96

Depth (ft)	STRATUM	Graphic Symbol	MATERIAL DESCRIPTION	Elevation	REMARKS
1	B		18 inches Agricultural soil.	95	AGRICULTURAL SOIL
2	C		Red brown SILT, little coarse to fine Sand, trace coarse to fine Gravel (Shale Fragments). (ML)	94	RESIDUAL
3	D		Red brown Weathered SHALE.	93	WEATHERED SHALE
			Bottom of Test Pit at 3.2'		Bucket refusal @ 3.2 FT
4				92	
5				91	
6				90	
7				89	
8				88	

TEST PIT LOG

Test Pit # T-07

Dates: Started: 7/20/2021 **Completed:** 7/20/2021
Time: Started: **Completed:**
Groundwater Encountered: N/E feet
Groundwater Notations:
Encountered: Time: **Elevation:** ±
Completed: Time: **Elevation:** ±
Weather: Clear **Temperature:** 80-85F°
Excavation Equipment: Wacker ET90
Backfilled Upon Completion: YES

Van Cleef ENGINEERING ASSOCIATES, LLC

Project: Proposed Warehouses
Project Number: 20-47-H
Project Location: Block 200, Lots 20 (part), 32 & 33 Hillsborough Twp, Somerset Co, NJ
VCEA Representative: E. DeRicco
Test Pit Location: See Test Pit Location Plan
Ground Surface Elevation (ft): ± 96

Depth (ft)	STRATUM	Graphic Symbol	MATERIAL DESCRIPTION	Elevation	REMARKS
0	B		12 inches Agricultural soil.	96	AGRICULTURAL SOIL
1	C		Red brown SILT, little coarse to fine Sand, trace coarse to fine Gravel (Shale Fragments). (ML)	95	RESIDUAL
2	D		Red brown Weathered SHALE.	94	WEATHERED SHALE
3			Bottom of Test Pit at 3'	93	Bucket refusal @ 3.0 FT
4				92	
5				91	
6				90	
7				89	
8				88	

TEST PIT LOG

Test Pit # T-08

Dates: Started: 7/20/2021 **Completed:** 7/20/2021
Time: Started: **Completed:**
Groundwater Encountered: N/E feet
Groundwater Notations:
Encountered: Time: **Elevation:** ±
Completed: Time: **Elevation:** ±
Weather: Clear **Temperature:** 80-85F°
Excavation Equipment: Wacker ET90
Backfilled Upon Completion: YES

Van Cleef ENGINEERING ASSOCIATES, LLC

Project: Proposed Warehouses
Project Number: 20-47-H
Project Location: Block 200, Lots 20 (part), 32 & 33 Hillsborough Twp, Somerset Co, NJ
VCEA Representative: E. DeRicco
Test Pit Location: See Test Pit Location Plan
Ground Surface Elevation (ft): ± 82

Depth (ft)	STRATUM	Graphic Symbol	MATERIAL DESCRIPTION	Elevation	REMARKS
0	B		12 inches Agricultural soil.		AGRICULTURAL SOIL
1	C		Red brown SILT, little coarse to fine Sand, trace coarse to fine Gravel (Shale Fragments). (ML)	81	RESIDUAL
2	D		Red brown Weathered SHALE.	80	WEATHERED SHALE
3				79	
4			Bottom of Test Pit at 3.8'	78	Bucket refusal @ 3.8 FT
5				77	
6				76	
7				75	
8				74	

TEST PIT LOG

Test Pit # T-09

Dates: Started: 7/20/2021 **Completed:** 7/20/2021
Time: Started: **Completed:**
Groundwater Encountered: 4.8 feet
Groundwater Notations:
Encountered: Time: **Elevation:** 89.2 ±
Completed: Time: **Elevation:** ±
Weather: Clear **Temperature:** 80-85F°
Excavation Equipment: Wacker ET90
Backfilled Upon Completion: YES

Van Cleef ENGINEERING ASSOCIATES, LLC

Project: Proposed Warehouses
Project Number: 20-47-H
Project Location: Block 200, Lots 20 (part), 32 & 33 Hillsborough Twp, Somerset Co, NJ
VCEA Representative: E. DeRicco
Test Pit Location: See Test Pit Location Plan
Ground Surface Elevation (ft): ± 94

Depth (ft)	STRATUM	Graphic Symbol	MATERIAL DESCRIPTION	Elevation	REMARKS
	B		12 inches Agricultural soil.		AGRICULTURAL SOIL
1				93	
2	C		Red brown SILT, little coarse to fine Sand, trace coarse to fine Gravel (Shale Fragments). (ML)	92	RESIDUAL
3				91	
4	D		Red brown Weathered SHALE.	90	WEATHERED SHALE Seepage @ 4.8 FT
5			Bottom of Test Pit at 5'	89	Bucket refusal @ 5.0 FT
6				88	
7				87	
8				86	

TEST PIT LOG

Test Pit # T-10

Dates: Started: 7/20/2021 **Completed:** 7/20/2021
Time: Started: **Completed:**
Groundwater Encountered: N/E feet
Groundwater Notations:
Encountered: Time: **Elevation:** ±
Completed: Time: **Elevation:** ±
Weather: Clear **Temperature:** 80-85F°
Excavation Equipment: Wacker ET90
Backfilled Upon Completion: YES

Van Cleef ENGINEERING ASSOCIATES, LLC

Project: Proposed Warehouses
Project Number: 20-47-H
Project Location: Block 200, Lots 20 (part), 32 & 33 Hillsborough Twp, Somerset Co, NJ
VCEA Representative: E. DeRicco
Test Pit Location: See Test Pit Location Plan
Ground Surface Elevation (ft): ± 90

Depth (ft)	STRATUM	Graphic Symbol	MATERIAL DESCRIPTION	Elevation	REMARKS
	B		6 inches Topsoil.		TOPSOIL
1	C		Red brown SILT, little coarse to fine Sand, trace coarse to fine Gravel (Shale Fragments). (ML)	89	RESIDUAL
2	D		Red brown Weathered SHALE.	88	WEATHERED SHALE
3				87	
			Bottom of Test Pit at 3.5'		Bucket refusal @ 3.5 FT
4				86	
5				85	
6				84	
7				83	
8				82	

TEST PIT LOG

Test Pit # T-11

Dates: Started: 7/20/2021 **Completed:** 7/20/2021
Time: Started: **Completed:**
Groundwater Encountered: N/E feet
Groundwater Notations:
Encountered: Time: **Elevation:** ±
Completed: Time: **Elevation:** ±
Weather: Clear **Temperature:** 80-85F°
Excavation Equipment: Wacker ET90
Backfilled Upon Completion: YES

Van Cleef ENGINEERING ASSOCIATES, LLC

Project: Proposed Warehouses
Project Number: 20-47-H
Project Location: Block 200, Lots 20 (part), 32 & 33 Hillsborough Twp, Somerset Co, NJ
VCEA Representative: E. DeRicco
Test Pit Location: See Test Pit Location Plan
Ground Surface Elevation (ft): ± 84

Depth (ft)	STRATUM	Graphic Symbol	MATERIAL DESCRIPTION	Elevation	REMARKS
	B		12 inches Agricultural soil.		AGRICULTURAL SOIL
1	C		Red brown SILT, little coarse to fine Sand, trace coarse to fine Gravel (Shale Fragments). (ML)	83	RESIDUAL
2	D		Red brown Weathered SHALE.	82	WEATHERED SHALE
3				81	
4			Bottom of Test Pit at 4'	80	Bucket refusal @ 4.0 FT
5				79	
6				78	
7				77	
8				76	

TEST PIT LOG

Test Pit # T-12

Dates: Started: 7/20/2021 **Completed:** 7/20/2021
Time: Started: **Completed:**
Groundwater Encountered: N/E feet
Groundwater Notations:
Encountered: Time: **Elevation:** ±
Completed: Time: **Elevation:** ±
Weather: Clear **Temperature:** 80-85F°
Excavation Equipment: Wacker ET90
Backfilled Upon Completion: YES

Van Cleef ENGINEERING ASSOCIATES, LLC

Project: Proposed Warehouses
Project Number: 20-47-H
Project Location: Block 200, Lots 20 (part), 32 & 33 Hillsborough Twp, Somerset Co, NJ
VCEA Representative: E. DeRicco
Test Pit Location: See Test Pit Location Plan
Ground Surface Elevation (ft): ± 94

Depth (ft)	STRATUM	Graphic Symbol	MATERIAL DESCRIPTION	Elevation	REMARKS
	B		9 inches Agricultural / topsoil.		AGRICULTURAL SOIL
1	C		Red brown SILT, little coarse to fine Sand, trace coarse to fine Gravel (Shale Fragments). (ML)	93	RESIDUAL
2	D		Red brown Weathered SHALE.	92	WEATHERED SHALE
3				91	
4			Bottom of Test Pit at 4'	90	Bucket refusal @ 4.0 FT
5				89	
6				88	
7				87	
8				86	

TEST PIT LOG

Test Pit # T-13

Dates: Started: 7/20/2021 **Completed:** 7/20/2021
Time: Started: **Completed:**
Groundwater Encountered: N/E feet
Groundwater Notations:
Encountered: Time: **Elevation:** ±
Completed: Time: **Elevation:** ±
Weather: Clear **Temperature:** 80-85F°
Excavation Equipment: Wacker ET90
Backfilled Upon Completion: YES

Van Cleef ENGINEERING ASSOCIATES, LLC

Project: Proposed Warehouses
Project Number: 20-47-H
Project Location: Block 200, Lots 20 (part), 32 & 33 Hillsborough Twp, Somerset Co, NJ
VCEA Representative: E. DeRicco
Test Pit Location: See Test Pit Location Plan
Ground Surface Elevation (ft): ± 90

Depth (ft)	STRATUM	Graphic Symbol	MATERIAL DESCRIPTION	Elevation	REMARKS
1	B		12 inches Agricultural soil.	89	AGRICULTURAL SOIL
2	C		Red brown SILT, little coarse to fine Sand, trace coarse to fine Gravel (Shale Fragments). (ML)	88	RESIDUAL
3				87	
4				86	
5	D		Red brown Weathered SHALE.	85	WEATHERED SHALE
			Bottom of Test Pit at 5.5'		Bucket refusal @ 5.5 FT
6				84	
7				83	
8				82	

TEST PIT LOG

Test Pit # T-14

Dates: Started: 7/20/2021 **Completed:** 7/20/2021
Time: Started: **Completed:**
Groundwater Encountered: N/E feet
Groundwater Notations:
Encountered: Time: **Elevation:** ±
Completed: Time: **Elevation:** ±
Weather: Clear **Temperature:** 80-85F°
Excavation Equipment: Wacker ET90
Backfilled Upon Completion: YES

Van Cleef ENGINEERING ASSOCIATES, LLC

Project: Proposed Warehouses
Project Number: 20-47-H
Project Location: Block 200, Lots 20 (part), 32 & 33 Hillsborough Twp, Somerset Co, NJ
VCEA Representative: E. DeRicco
Test Pit Location: See Test Pit Location Plan
Ground Surface Elevation (ft): ± 84

Depth (ft)	STRATUM	Graphic Symbol	MATERIAL DESCRIPTION	Elevation	REMARKS
	B		6 inches Agricultural / topsoil.		AGRICULTURAL SOIL
	C		Red brown SILT, little coarse to fine Sand, trace coarse to fine Gravel (Shale Fragments). (ML)		RESIDUAL
1				83	
2	D		Red brown Weathered SHALE.	82	WEATHERED SHALE
3			Bottom of Test Pit at 3'	81	Bucket refusal @ 3.0 FT
4				80	
5				79	
6				78	
7				77	
8				76	

TEST PIT LOG

Test Pit # T-15

Dates: Started: 7/21/2021 **Completed:** 7/21/2021
Time: Started: **Completed:**
Groundwater Encountered: N/E feet
Groundwater Notations:
Encountered: Time: **Elevation:** ±
Completed: Time: **Elevation:** ±
Weather: Clear **Temperature:** 80-85F°
Excavation Equipment: Wacker ET90
Backfilled Upon Completion: YES

Van Cleef ENGINEERING ASSOCIATES, LLC

Project: Proposed Warehouses
Project Number: 20-47-H
Project Location: Block 200, Lots 20 (part), 32 & 33 Hillsborough Twp, Somerset Co, NJ
VCEA Representative: E. DeRicco
Test Pit Location: See Test Pit Location Plan
Ground Surface Elevation (ft): ± 90

Depth (ft)	STRATUM	Graphic Symbol	MATERIAL DESCRIPTION	Elevation	REMARKS
1	B		12 inches Agricultural / topsoil.	89	AGRICULTURAL SOIL
2	C		Red brown SILT, little coarse to fine Sand, trace coarse to fine Gravel (Shale Fragments). (ML)	88	RESIDUAL
3	D		Red brown Weathered SHALE.	87	WEATHERED SHALE
4				86	
			Bottom of Test Pit at 4.5'		Bucket refusal @ 4.5 FT
5				85	
6				84	
7				83	
8				82	

TEST PIT LOG

Test Pit # T-16

Dates: Started: 7/19/2021 **Completed:** 7/19/2021
Time: Started: **Completed:**
Groundwater Encountered: N/E feet
Groundwater Notations:
Encountered: Time: **Elevation:** ±
Completed: Time: **Elevation:** ±
Weather: Clear **Temperature:** 80-85F°
Excavation Equipment: Wacker ET90
Backfilled Upon Completion: YES

Van Cleef ENGINEERING ASSOCIATES, LLC

Project: Proposed Warehouses
Project Number: 20-47-H
Project Location: Block 200, Lots 20 (part), 32 & 33 Hillsborough Twp, Somerset Co, NJ
VCEA Representative: E. DeRicco
Test Pit Location: See Test Pit Location Plan
Ground Surface Elevation (ft): ± 80

Depth (ft)	STRATUM	Graphic Symbol	MATERIAL DESCRIPTION	Elevation	REMARKS
	B		9 inches topsoil.		TOPSOIL
1	C		Red brown SILT, little coarse to fine Sand, trace coarse to fine Gravel (Shale Fragments). (ML)	79	RESIDUAL
2	D		Red brown Weathered SHALE.	78	WEATHERED SHALE
3				77	
			Bottom of Test Pit at 3.5'		Bucket refusal @ 3.5 FT
4				76	
5				75	
6				74	
7				73	
8				72	

TEST PIT LOG

Test Pit # T-17

Dates: Started: 7/19/2021 **Completed:** 7/19/2021
Time: Started: **Completed:**
Groundwater Encountered: feet
Groundwater Notations:
Encountered: Time: **Elevation:** ±
Completed: Time: **Elevation:** ±
Weather: Clear **Temperature:** 80-85F°
Excavation Equipment: Wacker ET90
Backfilled Upon Completion: YES

Van Cleef ENGINEERING ASSOCIATES, LLC

Project: Proposed Warehouses
Project Number: 20-47-H
Project Location: Block 200, Lots 20 (part), 32 & 33 Hillsborough Twp, Somerset Co, NJ
VCEA Representative: E. DeRicco
Test Pit Location: See Test Pit Location Plan
Ground Surface Elevation (ft): ±

Depth (ft)	STRATUM	Graphic Symbol	MATERIAL DESCRIPTION	Elevation	REMARKS
1					Not permitted to perform test pit. Location to close to gas pipeline.
2					
3					
4					
5					
6					
7					
8					

TEST PIT LOG

Test Pit # T-18

Dates: Started: 7/19/2021 **Completed:** 7/19/2021
Time: Started: **Completed:**
Groundwater Encountered: N/E feet
Groundwater Notations:
Encountered: Time: **Elevation:** ±
Completed: Time: **Elevation:** ±
Weather: Clear **Temperature:** 80-85F°
Excavation Equipment: Wacker ET90
Backfilled Upon Completion: YES

Van Cleef ENGINEERING ASSOCIATES, LLC

Project: Proposed Warehouses
Project Number: 20-47-H
Project Location: Block 200, Lots 20 (part), 32 & 33 Hillsborough Twp, Somerset Co, NJ
VCEA Representative: E. DeRicco
Test Pit Location: See Test Pit Location Plan
Ground Surface Elevation (ft): ± 94

Depth (ft)	STRATUM	Graphic Symbol	MATERIAL DESCRIPTION	Elevation	REMARKS
1	B		12 inches topsoil and roots.	93	TOPSOIL
2	C		Tan to red brown SILT, little coarse to fine Sand, trace coarse to fine Gravel (Shale Fragments). (ML)	92	RESIDUAL
3	D		Tan Weathered SHALE.	91	WEATHERED SHALE
4			Bottom of Test Pit at 3.8'	90	Bucket refusal @ 3.8 FT
5				89	
6				88	
7				87	
8				86	

TEST PIT LOG

Test Pit # T-19

Dates: Started: 7/19/2021 **Completed:** 7/19/2021
Time: Started: **Completed:**
Groundwater Encountered: N/E feet
Groundwater Notations:
Encountered: Time: **Elevation:** ±
Completed: Time: **Elevation:** ±
Weather: Clear **Temperature:** 80-85F°
Excavation Equipment: Wacker ET90
Backfilled Upon Completion: YES

Van Cleef ENGINEERING ASSOCIATES, LLC

Project: Proposed Warehouses
Project Number: 20-47-H
Project Location: Block 200, Lots 20 (part), 32 & 33 Hillsborough Twp, Somerset Co, NJ
VCEA Representative: E. DeRicco
Test Pit Location: See Test Pit Location Plan
Ground Surface Elevation (ft): ± 98

Depth (ft)	STRATUM	Graphic Symbol	MATERIAL DESCRIPTION	Elevation	REMARKS
	B		8 inches topsoil.		TOPSOIL
1	C		Red brown SILT, little coarse to fine Sand, trace coarse to fine Gravel (Shale Fragments). (ML)	97	RESIDUAL
2				96	
3	D		Red brown Weathered SHALE.	95	WEATHERED SHALE
4				94	
5			Bottom of Test Pit at 5'	93	Bucket refusal @ 4.0 FT
6				92	
7				91	
8				90	

TEST PIT LOG

Test Pit # T-20

Dates: Started: 7/19/2021 **Completed:** 7/19/2021
Time: Started: **Completed:**
Groundwater Encountered: 4.5 feet
Groundwater Notations:
Encountered: Time: **Elevation:** 83.5 ±
Completed: Time: **Elevation:** ±
Weather: Clear **Temperature:** 80-85F°
Excavation Equipment: Wacker ET90
Backfilled Upon Completion: YES

Van Cleef ENGINEERING ASSOCIATES, LLC

Project: Proposed Warehouses
Project Number: 20-47-H
Project Location: Block 200, Lots 20 (part), 32 & 33 Hillsborough Twp, Somerset Co, NJ
VCEA Representative: E. DeRicco
Test Pit Location: See Test Pit Location Plan
Ground Surface Elevation (ft): ± 88

Depth (ft)	STRATUM	Graphic Symbol	MATERIAL DESCRIPTION	Elevation	REMARKS
1	A		Red brown SILT, little coarse to fine Sand, trace coarse to fine Gravel (Shale Fragments), trace Debris. (FILL)	87	FILL
2				86	
3				85	
4				84	Seepage @ 4.5'
5			Garbage mixed with trash bags. (FILL)	83	
6	D		Red brown Weathered SHALE.	82	WEATHERED SHALE
			Bottom of Test Pit at 6.5'		Bucket refusal @ 6.5 FT
7				81	
8				80	

TEST PIT LOG

Test Pit # T-21

Dates: Started: 7/19/2021 **Completed:** 7/19/2021
Time: Started: **Completed:**
Groundwater Encountered: feet
Groundwater Notations:
Encountered: Time: **Elevation:** ±
Completed: Time: **Elevation:** ±
Weather: Clear **Temperature:** 80-85F°
Excavation Equipment: Wacker ET90
Backfilled Upon Completion: YES

Van Cleef ENGINEERING ASSOCIATES, LLC

Project: Proposed Warehouses
Project Number: 20-47-H
Project Location: Block 200, Lots 20 (part), 32 & 33 Hillsborough Twp, Somerset Co, NJ
VCEA Representative: E. DeRicco
Test Pit Location: See Test Pit Location Plan
Ground Surface Elevation (ft): ±

Depth (ft)	STRATUM	Graphic Symbol	MATERIAL DESCRIPTION	Elevation	REMARKS
1					Unable to perform test pit. Location inside electrified fence with cows.
2					
3					
4					
5					
6					
7					
8					

TEST PIT LOG

Test Pit # T-22

Dates: Started: 7/19/2021 **Completed:** 7/19/2021
Time: Started: **Completed:**
Groundwater Encountered: N/E feet
Groundwater Notations:
Encountered: Time: **Elevation:** ±
Completed: Time: **Elevation:** ±
Weather: Clear **Temperature:** 80-85F°
Excavation Equipment: Wacker ET90
Backfilled Upon Completion: YES

Van Cleef ENGINEERING ASSOCIATES, LLC

Project: Proposed Warehouses
Project Number: 20-47-H
Project Location: Block 200, Lots 20 (part), 32 & 33 Hillsborough Twp, Somerset Co, NJ
VCEA Representative: E. DeRicco
Test Pit Location: See Test Pit Location Plan
Ground Surface Elevation (ft): ± 92

Depth (ft)	STRATUM	Graphic Symbol	MATERIAL DESCRIPTION	Elevation	REMARKS
	B		8 inches topsoil.		TOPSOIL
1	C		Red brown SILT, little coarse to fine Sand, trace coarse to fine Gravel (Shale Fragments). (ML)	91	RESIDUAL
2				90	
	D		Red brown Weathered SHALE.		WEATHERED SHALE
3			Bottom of Test Pit at 3'	89	Bucket refusal @ 3.0 FT
4				88	
5				87	
6				86	
7				85	
8				84	

TEST PIT LOG

Test Pit # T-23

Dates: Started: 7/19/2021 **Completed:** 7/19/2021
Time: Started: **Completed:**
Groundwater Encountered: N/E feet
Groundwater Notations:
Encountered: Time: **Elevation:** ±
Completed: Time: **Elevation:** ±
Weather: Clear **Temperature:** 80-85F°
Excavation Equipment: Wacker ET90
Backfilled Upon Completion: YES

Van Cleef ENGINEERING ASSOCIATES, LLC

Project: Proposed Warehouses
Project Number: 20-47-H
Project Location: Block 200, Lots 20 (part), 32 & 33 Hillsborough Twp, Somerset Co, NJ
VCEA Representative: E. DeRicco
Test Pit Location: See Test Pit Location Plan
Ground Surface Elevation (ft): ± 98

Depth (ft)	STRATUM	Graphic Symbol	MATERIAL DESCRIPTION	Elevation	REMARKS
	B		12 inches Topsoil with roots.		TOPSOIL
1				97	
	C		Red brown SILT, little coarse to fine Sand, trace coarse to fine Gravel (Shale Fragments). (ML)		RESIDUAL
2				96	
3				95	
	D		Tan to red brown Weathered SHALE.		WEATHERED SHALE
4			Bottom of Test Pit at 4'	94	Bucket refusal @ 4.0 FT
5				93	
6				92	
7				91	
8				90	

TEST PIT LOG

Test Pit # T-24

Dates: Started: 7/19/2021 **Completed:** 7/19/2021
Time: Started: **Completed:**
Groundwater Encountered: N/E feet
Groundwater Notations:
Encountered: Time: **Elevation:** ±
Completed: Time: **Elevation:** ±
Weather: Clear **Temperature:** 80-85F°
Excavation Equipment: Wacker ET90
Backfilled Upon Completion: YES

Van Cleef ENGINEERING ASSOCIATES, LLC

Project: Proposed Warehouses
Project Number: 20-47-H
Project Location: Block 200, Lots 20 (part), 32 & 33 Hillsborough Twp, Somerset Co, NJ
VCEA Representative: E. DeRicco
Test Pit Location: See Test Pit Location Plan
Ground Surface Elevation (ft): ± 102

Depth (ft)	STRATUM	Graphic Symbol	MATERIAL DESCRIPTION	Elevation	REMARKS
	B		8 inches topsoil.		TOPSOIL
1	C		Red brown SILT and coarse to fine Sand, some coarse to fine Gravel (Shale Fragments). (ML)	101	WEATHERED SHALE
2				100	
3				99	
4			Red brown SILT, little coarse to fine Sand, trace coarse to fine Gravel (Shale Fragments). (ML)	98	
5				97	
6	D		Red brown Weathered SHALE.	96	RESIDUAL
7			Bottom of Test Pit at 7'	95	Bucket refusal @ 7.0 FT
8				94	

TEST PIT LOG

Test Pit # T-25

Dates: Started: 7/19/2021 **Completed:** 7/19/2021
Time: Started: **Completed:**
Groundwater Encountered: N/E feet
Groundwater Notations:
Encountered: Time: **Elevation:** ±
Completed: Time: **Elevation:** ±
Weather: Clear **Temperature:** 80-85F°
Excavation Equipment: Wacker ET90
Backfilled Upon Completion: YES

Van Cleef ENGINEERING ASSOCIATES, LLC

Project: Proposed Warehouses
Project Number: 20-47-H
Project Location: Block 200, Lots 20 (part), 32 & 33 Hillsborough Twp, Somerset Co, NJ
VCEA Representative: E. DeRicco
Test Pit Location: See Test Pit Location Plan
Ground Surface Elevation (ft): ± 100

Depth (ft)	STRATUM	Graphic Symbol	MATERIAL DESCRIPTION	Elevation	REMARKS
1	B		18 inches Topsoil with roots.	99	TOPSOIL
2	C		Red brown SILT, little coarse to fine Sand, trace coarse to fine Gravel (Shale Fragments). (ML)	98	RESIDUAL
3	D		Red brown Weathered SHALE.	97	WEATHERED SHALE
4			Bottom of Test Pit at 3.5'	96	Bucket refusal @ 3.5 FT
5				95	
6				94	
7				93	
8				92	

TEST PIT LOG

Test Pit # T-26

Dates: Started: 7/19/2021 **Completed:** 7/19/2021
Time: Started: **Completed:**
Groundwater Encountered: feet
Groundwater Notations:
Encountered: Time: **Elevation:** ±
Completed: Time: **Elevation:** ±
Weather: Clear **Temperature:** 80-85F°
Excavation Equipment: Wacker ET90
Backfilled Upon Completion: YES

Van Cleef ENGINEERING ASSOCIATES, LLC

Project: Proposed Warehouses
Project Number: 20-47-H
Project Location: Block 200, Lots 20 (part), 32 & 33 Hillsborough Twp, Somerset Co, NJ
VCEA Representative: E. DeRicco
Test Pit Location: See Test Pit Location Plan
Ground Surface Elevation (ft): ±

Depth (ft)	STRATUM	Graphic Symbol	MATERIAL DESCRIPTION	Elevation	REMARKS
1					Unable to perform test pit. Location inside electrified fence with cows.
2					
3					
4					
5					
6					
7					
8					

TEST PIT LOG

Test Pit # T-27

Dates: Started: 7/19/2021 **Completed:** 7/19/2021
Time: Started: **Completed:**
Groundwater Encountered: N/E feet
Groundwater Notations:
Encountered: Time: **Elevation:** ±
Completed: Time: **Elevation:** ±
Weather: Clear **Temperature:** 80-85F°
Excavation Equipment: Wacker ET90
Backfilled Upon Completion: YES

Van Cleef ENGINEERING ASSOCIATES, LLC

Project: Proposed Warehouses
Project Number: 20-47-H
Project Location: Block 200, Lots 20 (part), 32 & 33 Hillsborough Twp, Somerset Co, NJ
VCEA Representative: E. DeRicco
Test Pit Location: See Test Pit Location Plan
Ground Surface Elevation (ft): ± 96

Depth (ft)	STRATUM	Graphic Symbol	MATERIAL DESCRIPTION	Elevation	REMARKS
	B		8 inches Topsoil.		TOPSOIL
1	C		Red brown SILT, little coarse to fine Sand, trace coarse to fine Gravel (Shale Fragments). (ML)	95	RESIDUAL
2	D		Red brown Weathered SHALE.	94	WEATHERED SHALE
3			Bottom of Test Pit at 3'	93	Bucket refusal @ 3.0 FT
4				92	
5				91	
6				90	
7				89	
8				88	

TEST PIT LOG

Test Pit # T-28

Dates: Started: 7/19/2021 **Completed:** 7/19/2021
Time: Started: **Completed:**
Groundwater Encountered: 4.5 feet
Groundwater Notations:
Encountered: Time: **Elevation:** 97.5 ±
Completed: Time: **Elevation:** ±
Weather: Clear **Temperature:** 80-85F°
Excavation Equipment: Wacker ET90
Backfilled Upon Completion: YES

Van Cleef ENGINEERING ASSOCIATES, LLC

Project: Proposed Warehouses
Project Number: 20-47-H
Project Location: Block 200, Lots 20 (part), 32 & 33 Hillsborough Twp, Somerset Co, NJ
VCEA Representative: E. DeRicco
Test Pit Location: See Test Pit Location Plan
Ground Surface Elevation (ft): ± 102

Depth (ft)	STRATUM	Graphic Symbol	MATERIAL DESCRIPTION	Elevation	REMARKS
0	B		12 inches Agricultural soil.		AGRICULTURAL SOIL
1				101	
	C		Red brown SILT, little coarse to fine Sand, trace coarse to fine Gravel (Shale Fragments). (ML)		RESIDUAL
2				100	
3				99	
	D		Red brown Weathered SHALE.		WEATHERED SHALE
4				98	
5			Bottom of Test Pit at 5'	97	Bucket refusal @ 5.0 FT
6				96	
7				95	
8				94	

TEST PIT LOG

Test Pit # T-29

Dates: Started: 7/19/2021 **Completed:** 7/19/2021
Time: Started: **Completed:**
Groundwater Encountered: 4.4 feet
Groundwater Notations:
Encountered: Time: **Elevation:** 99.6 ±
Completed: Time: **Elevation:** ±
Weather: Clear **Temperature:** 80-85F°
Excavation Equipment: Wacker ET90
Backfilled Upon Completion: YES

Van Cleef ENGINEERING ASSOCIATES, LLC

Project: Proposed Warehouses
Project Number: 20-47-H
Project Location: Block 200, Lots 20 (part), 32 & 33 Hillsborough Twp, Somerset Co, NJ
VCEA Representative: E. DeRicco
Test Pit Location: See Test Pit Location Plan
Ground Surface Elevation (ft): ± 104

Depth (ft)	STRATUM	Graphic Symbol	MATERIAL DESCRIPTION	Elevation	REMARKS
	B		4 inches Topsoil.		TOPSOIL
1	C		Red brown SILT, little coarse to fine Sand, trace coarse to fine Gravel (Shale Fragments). (ML)	103	RESIDUAL
2				102	
3				101	
4	D		Red brown Weathered SHALE.	100	WEATHERED SHALE
			Bottom of Test Pit at 4.5'		Bucket refusal @ 4.5 FT
5				99	
6				98	
7				97	
8				96	

TEST PIT LOG

Test Pit # T-30

Dates: Started: 7/19/2021 **Completed:** 7/19/2021
Time: Started: **Completed:**
Groundwater Encountered: N/E feet
Groundwater Notations:
Encountered: Time: **Elevation:** ±
Completed: Time: **Elevation:** ±
Weather: Clear **Temperature:** 80-85F°
Excavation Equipment: Wacker ET90
Backfilled Upon Completion: YES

Van Cleef ENGINEERING ASSOCIATES, LLC

Project: Proposed Warehouses
Project Number: 20-47-H
Project Location: Block 200, Lots 20 (part), 32 & 33 Hillsborough Twp, Somerset Co, NJ
VCEA Representative: E. DeRicco
Test Pit Location: See Test Pit Location Plan
Ground Surface Elevation (ft): ± 104

Depth (ft)	STRATUM	Graphic Symbol	MATERIAL DESCRIPTION	Elevation	REMARKS
1	A		Red brown to black silt, sand, gravel and debris. (FILL)	103	FILL Petroleum odor.
2				102	
3				101	
4	D		Red brown Weathered SHALE.	100	WEATHERED SHALE
			Bottom of Test Pit at 4.5'		Bucket refusal @ 4.5 FT
5				99	
6				98	
7				97	
8				96	

MODIFIED METHOD
FOR
IDENTIFICATION OF SOILS
AFTER
DR. D.M. BURMISTER

Soil Component	Descriptive Terms As Written on Log	Range of Proportions
PRINCIPAL COMPONENT (All Letters Capitalized)	--	35% of more
MINOR COMPONENTS (First Letter Capitalized)	and (a.)	35% to 50%
	some (s.)	20% to 35%
	little (l.)	10% to 20%
	trace (tr.)	1% to 10%

Gradation of Components

Coarse to fine	Coarse to fine	cf	All sizes
Coarse to medium	Coarse to medium	cm	Less than 10% fine
Medium to fine	Medium to fine	mf	Less than 10% coarse
Coarse	Coarse	c	Less than 10% medium & fine
Medium	Medium	m	Less than 10% coarse & fine
Fine	Fine	f	Less than 10% coarse & medium

Component	U.S. Standard Sieve Range
Boulders	9” and larger
Cobbles	3” to 9”
Gravel	
Coarse	3” to 1”
Medium	1” to 3/8”
Fine	3/8” to #10
Sand	
Coarse	#10 to #30
Medium	#30 to #60
Fine	#60 to #200
Silt	< #200

Fine Grained Soils-Plasticity of Components

Component	Symbol	Overall Plasticity	Plasticity Index
SILT	S	Non-Plastic	0
Clayey Silt	CyS	Slight	1 to 5
SILT & CLAY	S & C	Low	5 to 10
CLAY & SILT	C & S	Medium	10 to 20
Silty Clay	SyC	High	20 to 40
CLAY	C	Very High	Over 40

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

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS.

GRADATION*

% FINER BY WEIGHT

TRACE	0% TO 10%
LITTLE	10% TO 20%
SOME	20% TO 35%
AND	35% TO 50%

COMPACTNESS*
SAND AND/OR GRAVEL

RELATIVE DENSITY	
LOOSE	0% TO 40%
MEDIUM DENSE	40% TO70%
DENSE	70% TO 90%
VERY DENSE	90% TO 100%

CONSISTENCY*
CLAY AND/OR SILT

RANGE OF SHEARING STRENGTH IN POUNDS PER SQUARE FOOT	
VERY SOFT	LESS THAN 250
SOFT	250 TO 500
MEDIUM	500 TO 1000
STIFF	1000 TO 2000
VERY STIFF	2000 TO 4000
HARD	GREATER THAN 4000

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

UNIFIED SOIL CLASSIFICATION SYSTEM

SOIL CLASSIFICATION CHART

APPENDIX C

LIMITATIONS

This report has been prepared in accordance with generally accepted geotechnical design practices for specific application to this project. This report has been based on assumed conditions and characteristics of the proposed development where specific information was not available.

The conclusions and recommendations contained in this report are based upon the subsurface data obtained during this investigation and on details stated in this report. The validity of the projections, conclusions, and recommendations contained in this report is necessarily limited by the scope of field investigation and by the number of test pits that were performed. Should conditions arise which differ from those described in this report, Van Cleef Engineering Associates should be notified immediately and provided with all information when available regarding subsurface conditions.

Van Cleef Engineering Associates' recommendations are based upon the assumption that the services of a qualified geotechnical engineer will be retained for the observation of stripping operations, proofrolling, structural fill placement, and all critical earthwork operations.

The scope of this investigation was limited to the evaluation of the load-carrying capabilities and load stability of the subsurface soils. Oil, hazardous/contaminated waste, radioactivity, irritants, pollutants, radon or other dangerous substances and conditions were not the subject of this study. Their presence and/or absence are not implied, inferred or suggested by this report or results of this study.