GEOTECHNICAL ENGINEERING REPORT

For

Compass Self Storage Facility Expansion
1109 N. 9th Ave, Neptune, NJ

Prepared for:

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TRC Project No. 514613.0000

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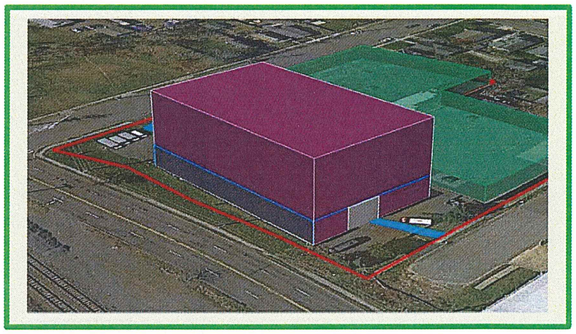

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Re: Geotechnical Engineering Report
Compass Self Storage Facility Expansion – 1109 N. 9th Ave, Neptune, NJ
TRC Project#: 514613.0000

Dear Mr. Steinberg:

We are pleased to present the results of our geotechnical exploration for this project. The work was performed by TRC as requested by Amsdell Construction, Inc. in general accordance with TRC's proposal dated October 14, 2022 and your subsequent signed authorization to proceed. This Report summarizes our understanding of the proposed construction, describes the drilling and testing procedures, discusses our observations, and presents the findings and recommendations as it relates to foundation design and earthwork construction for the planned development.

INTRODUCTION

Proposed Construction

The project site is situated at 1109 N. Ninth Avenue in Neptune, NJ. The site is currently occupied with two single-story buildings. The proposed construction includes demolition of the two existing single-story buildings and replacement with a single four-story, slab-on-grade structure with no basements. The building replacement area footprint will be approximately 18,375 square feet. TRC understands that the existing storm sewer and drainage easement running below the middle of the building will be relocated outside of the building footprint and along 9th Ave. The area of the proposed construction is relatively flat and is at the east portion of the site with the existing buildings. ***The building/structural loads and a proposed grading plan were not available to TRC at the time of this report, only a schematic layout of the conceptual building layout***. No unusual loading condition or settlements restriction have been specified. Although a site grading plan is not available at this time, it is assumed that the final grades will be similar to existing grades.

Objectives

The objectives of this geotechnical exploration were to determine and evaluate the subsurface conditions at the Site with respect to the proposed construction and address such project-specific items as:

- Recommended foundation system(s) and criteria to be used in the design (by others) thereof including allowable bearing capacities and the proposed bearing levels including anticipated settlements and relevant properties.
- Earthwork recommendations for site preparation including placement, compaction and testing of fills.

- Groundwater conditions including perched conditions and control of groundwater during construction, as applicable.
- Criteria for site preparation for slab on grade subgrade and design recommendations.
- Seismic Site Class parameters as determined by the 2018 International Building Code (ASCE 7-16).
- Frost depth.
- Other construction-related concerns, as warranted based on site subsurface conditions, details of the proposed construction, and anticipated loading conditions

FIELD AND LABORATORY WORK

Geotechnical Drilling Exploration

A total of four (4) test borings were drilled and samples collected by TRC's drilling subcontractor, FM & W Drilling, Inc., under the full-time field supervision by a member of TRC's professional staff. The test borings were completed on November 4, 2022 at the approximate locations shown on the Boring Location Plan included in Attachment A. Three (3) test borings were advanced to depths of 25 feet below the existing ground surface (bgs) and one (1) test boring to a depth of 35 feet bgs. Approximate test boring locations were selected by TRC geotechnical personnel and field located by TRC using the existing site features (i.e., building corners, pavements, etc.) as a reference.

The soils encountered in the borings were sampled continuously to a depth of 10 feet bgs and at 5-foot intervals below 10 feet to the depth of the boring using the Standard Penetration Test (SPT) Method (American Society of Testing and Materials [ASTM] D1586). The samples were obtained by driving the split spoon sampler 18 to 24 inches into the soil with a 140-pound automatic hammer free-falling 30 inches. The number of blows required for each 6 inches of penetration was recorded separately. The SPT "N-values" of the soil were calculated as the sum of number of blows required for the middle 12 inches of penetration for 24-inch samples or final 12 inches of penetration for 18-inch samples. The SPT N-value serves as an indicator of consistency for cohesive soils and relative density of granular soils. The blow counts are shown on the boring logs in Attachment B at the respective sample depths.

At the completion of drilling operations, the test borings were backfilled to the original ground surface using the auger cuttings.

Laboratory Work

The soil samples were delivered to TRC's AASHTO/ASTM accredited soils laboratory where the field soil descriptions were reviewed and edited by a member of TRC's geotechnical engineering team. Representative soil samples were then selected and assigned for geotechnical laboratory testing. The cohesionless (granular) materials, were subjected to grain-size analyses (ASTM D422) and moisture content determinations (ASTM D2216). Fine-grained (silt) materials were tested for determination of plasticity characteristics (Atterberg limits) and moisture content. All phases of the laboratory testing program were conducted in general accordance with applicable ASTM procedures. Soil descriptions recorded on the boring logs in Attachment B result from field observations as well as from laboratory test data. Copies of the laboratory test results are provided in Attachment C. Soil samples will be stored at TRC's laboratory for 30 days from the date of this Report at which time they will be discarded unless otherwise agreed upon between TRC and the Client.

SITE CONDITIONS

Regional Geology

Published geologic data indicates that the general area of the project site is underlain by the Lower Member of the Kirkwood Formation that consists of light-yellow to white, fine to medium-grained sand and dark-gray clay-silt. Alluvial soil deposits of this formation are typically coarse, detrital, and unconsolidated.

Subsurface Conditions

A 6-inch to 12-inch combined layer of asphalt pavement and aggregate subbase was encountered at the existing ground surface at three (3) of the four (4) test boring locations. At test boring B-2, a 6-inch layer of topsoil was encountered at the ground surface. All borings were drilled through asphalt pavement surface except for boring B-4 which was drilled in grass covered area. Below the pavement or topsoil, the underlying soils encountered in the test borings are grouped into three distinct strata based on their physical and engineering characteristics as described below.

FILL – This stratum was encountered beneath the asphalt pavement and subbase in borings B-1 and B-3 and extends to approximate depths ranging from 2 ft to 6 ft bgs. The FILL generally consists of silty sand and sandy silt with varying amounts of gravel and traces of brick and glass debris. SPT N-values indicate the relative density of the FILL material generally ranges from "very loose" to "medium dense". Laboratory test results indicate that the fines (silt) content of the fill layer ranges from approximately 18% to 36% and is non-plastic and Unified Soil Classification System (USCS) classifications of SM. Natural moisture contents range from approximately 14% to 29%. This material appears to be uncontrolled fill placed randomly and varies in relative density as previously discussed. The depth and engineering characteristics of the fill materials, such as composition, strength, and compressibility are considered to be variable. There is no specific documentation available with the Client which documents in detail the origin, method of placement, or the extent of moisture and compaction control during placement. As such, without records of fill placement monitoring and testing, the possibility exists that the fill may contain other deleterious material not disclosed by the borings. Consequently, there is a greater than typical risk of unacceptable settlement of shallow foundations constructed when beared in the fill material, or an of any fill where placement records are unavailable.

SILT/POSSIBLE ORGANIC SILT– This stratum was encountered underlying the FILL stratum or surficial sand layer in all borings, extending to depths ranging from approximately depth of 15 to at least 21 feet bgs. This stratum generally consists of a dark gray to black silt with trace quantities of fine-grained sand and gravel. SPT N-values indicate the consistency of this stratum is "very soft" to "stiff". Laboratory testing performed on representative samples indicates USCS classifications of ML, MH and/or OL/OH. Results of Atterberg limits testing indicate plastic limits ranging from 29% to 73%, liquid limits ranging from 42% to 135%, and plasticity indices ranging from 13 to 62. Organic liquid limit testing was not included. Laboratory determined moisture contents range from approximately 32% to 60%, Based on the laboratory test results, this material is expected to be moderately to highly compressible which will continue over the life of the structure. Due to the compressible nature and highly variable composition/consistency of this material, deep foundation systems (if selected for use on this project) should not bear in the SILT/ORGANIC SILT soils.

SAND/SILTY SAND – This stratum was encountered underlying and/or interbedded between the SILT strata in all borings beginning from approximate depths ranging from 8 ft to 15 ft bgs and typically ranging from 3.5 ft to 10+ ft in thickness. This stratum generally consists of a brown to gray sands with some silt and trace amounts of gravel. SPT N-values indicate the relative density of this stratum ranges from "very loose" to "dense". Laboratory test results indicate that the fines (silt) content of the sand layer ranges from approximately 3% to 18% and is non-plastic. Laboratory testing performed on representative samples indicates USCS classifications of SM and SP. Natural moisture contents range from approximately 14% to 18%.

Groundwater

Observations for groundwater were made during drilling in each test boring. Groundwater was first encountered in each of the test boring at depths ranging from approximately 6 feet bgs to 7 feet bgs. The boreholes were backfilled with soil cuttings immediately upon completion for safety and therefore, no long-term groundwater measurements were obtained. The water readings recorded on the logs represent the conditions at the time the measurements were taken and do not reflect daily, seasonal, or long-term fluctuations in the groundwater level or development of perched water.

Hydrostatic groundwater levels and upper (perched) saturation zones should be expected to fluctuate seasonally due to variations in rainfall, runoff, evapotranspiration, tidal fluctuations within the nearby lakes, Shark River, and Atlantic Ocean. Consequently, any measured groundwater levels shown on the boring logs only represent conditions at the time the readings were collected and may thus be different at the time of construction. Furthermore, the actual groundwater levels, seepage, and localized saturated conditions may be observed at shallower depths during periods of heavy precipitation. Static daily and seasonal groundwater levels and upper (perched) saturation zones would need to be determined through the installation and monitoring of piezometers, especially in fine-grained soil stratums. The installation and monitoring of groundwater piezometers is outside of TRC's scope of work. The boreholes were subsequently backfilled with soil cuttings following water level measurements immediately upon completion of drilling activities.

OBSERVATIONS AND RECOMMENDATIONS

Foundations

Based on the subsurface conditions encountered, our understanding of the proposed construction, and the results of the field exploration and laboratory testing, it is our experience the existing loose FILL soils and the soft SILT/organic SILT layer are not generally suitable for support of settlement sensitive structures, heavily loaded and/or settlement sensitive ground floor slabs, and large diameter and/or settlement sensitive utility lines. Depending on the risk and settlement tolerances for the proposed construction, consideration can be given to supporting small, lightly loaded, non-settlement sensitive structures, small diameter utilities, and roadways on properly improved subgrade as discussed below.

General Considerations

The existing FILL soils that extend to depths of about 2 to 6 ft bgs and the underlying SILT/ORGANIC SILT soils which extend to minimum depths of 15 ft bgs are not suitable for support of conventional shallow foundations or floor slabs. These soils are generally "very loose"/"very soft" to "loose"/"soft' and supporting settlement sensitive structures in or above these materials will result in large, unacceptable total and differential settlements. Total settlements are expected to be on the order of 5 to 12 inches, or more. ***Therefore, we recommend that any settlement sensitive structures, including the new four-story building, be supported by an extended type foundation system to bypass the existing fairly thick loose FILL and soft Organic SILT or a ground improvement program that will densify the near surface soils.***

The following alternates were evaluated:

- Helical Piers
- Rammed Aggregate Piers

Auger Cast Piles and Drilled Shafts, while feasible, are not considered to be cost effective for a project of this small magnitude. Timber piles, though cost effective, were eliminated from our consideration because of the potential for excessive vibrations during the installation process which could lead to potential damage to the existing nearby structures and utilities.

Helical Piles

A helical pile system, such as that manufactured by Stelcore, Magnum Piering, or similar, could be considered for support of the proposed structures. Lateral and uplift capacities of helical piles, as well as the ability of the shaft to withstand anticipated installation torque based on subsurface conditions, should be verified by the pile manufacturer or installer. Based on our preliminary evaluation of the available helical pile systems and the anticipated subsurface conditions, helical piles should consist of 2 to 3 helix plates and minimum 1.5 in. square solid steel shaft that has been hot-dip galvanized in accordance with ASTM A153. The uppermost plate should be embedded in the "medium dense" to "dense" sand layer below the existing soft SILT. For design purposes, the uppermost bearing plate of the helical piles should bear at depths on the order of 15 to 21 ft below the existing grades. Based on consultation with a local specialty contractor, preliminary estimated working capacities developed from an 8-10-12 inch helix plate installed into the natural sandy soil layer is expected to provide a minimum allowable pile capacity ranging from 7-10 tons assuming a factor of safety of 2.0. All piles should include a 6-inch grout column along the shaft length to ensure intimate contact with surrounding soils and provide additional stability through the very soft organic silt layer and so not to negatively impact lateral stability. Generally speaking, additional capacities can be developed using larger diameters and helix combinations and/or deeper pile tip embedment.

The final design should be verified by the pile manufacturer prior to implementation at the Site. In Addition, the type and diameter of the shaft and helixes to be used, as well as the central bar characteristics should be verified by the product manufacturer based on this design capacity and anticipated torque value required for installation of the helical piles. If subsurface obstructions are encountered during helix installation, pre-drilling or pre-excavation will be required.

Alternately, rather than a conventional small shaft diameter helical pile, a continuous flight helical pile, could be utilized that can be drilled and grouted in-place to provide additional capacity and lateral stability as compared to a conventional helical pile with larger diameter helices, if necessary. It should also be noted that static load testing will be required for piles having capacities over 40 tons (if applicable) in accordance with the New Jersey Building Code.

Shallow Foundations on Ground Improvement

Ground improvement systems were evaluated for support as an alternative to a deep foundation support system for load transfer and to improve soil properties. The ground modification system described below will improve bearing capacity and reduce the total and differential settlements within the improved area. The ground modification system would consist of rigid geo-inclusions such as rammed aggregate piers, which could be mixed with the addition of cement or grout to provide additional stiffness through the soft silt layer. Rammed aggregate piers (RAPs) are vertical columns of aggregate, placed in lifts and mechanically tamped in augered holes. These aggregate inclusions serve to stiffen and reinforce the composite soil matrix. The RAPs would extend into the competent sand layer below the silt layer to maximize their capacity and minimize post construction settlements. We would anticipate that the RAPs would be founded within the medium dense sand stratum. RAPs should be constructed of clean aggregate, similar to

AASHTO No. 57 Stone, in order to provide rapid drainage and dissipation of pore water pressure and to minimize tip stresses distributed to the lower sand stratum.

Generally, the diameter and spacing can be adjusted based on anticipated loading conditions, acceptable settlement tolerances, and reinforcement/improvement requirements. If ground modifications are planned to be utilized, specialty contractors such as Geostructures, Hayward-Baker, or Nicholson should be contacted for preliminary or final design based on loading information and settlement criteria to be provided by the designers. The use of a RAPs or similar proprietary ground improvement systems would allow for the construction of shallow foundations and slab-on-grade for support of the proposed structures.

Shallow foundation systems consisting of spread footings or rigid mat slabs, as applicable were considered for foundation support of the proposed structures. Due to the presence of fill underlain by soft silty/potentially organic soils, long-term total and differential settlements are anticipated that could potentially damage the structure and/or require significant maintenance of the structures. ***Therefore, shallow foundations or rigid mat slabs will only be feasible in conjunction with a properly designed ground improvement program or where structurally supported by a helical pile system.*** All foundations should bear at a depth of at least 30 inches below the finish floor elevation or exterior grade. It is recommended that stormwater be diverted away from the building exteriors to reduce the possibility of erosion beneath the exterior footings.

Due to the presence of the compressible organic silt layer encountered in the test borings, it is recommended the Building Designers consider the use ground improvement or reinforced mat foundations for the storage buildings with additional reinforcement at concentrated locations such as perimeter or interior wall locations and columns. Alternatively, the use of perimeter and interior grade beams could be considered. The deeper concrete section, and top and bottom steel configuration of a typical grade beam foundation, can provide added stiffness to the structures and help mitigate differential settlement concerns. A modulus of subgrade reaction of 75 pounds per cubic inch (pci) may be used for grade beam or mat foundation design. Utilities with flexible connections are also recommended to accommodate settlement across the transition zone from the structure supported on improved ground/deep foundation to the natural soils.

To guard against a punching type shear failure, minimum widths recommended for turned-down portions of mat foundations or grade beams are 24 inches and 18 inches, respectively. Although the maximum allowable soil bearing pressure may not be achieved, these width recommendations should control the minimum size of the foundations. All footing excavations should be cut to vertical side walls, if possible, within the granular soils, and flat bottoms, with the bottoms comprised of firm soil undisturbed by the method of excavation or softened by standing water. Because excavation for foundations into granular fill soils could lead to side wall instability, the use of concrete forming will likely be required. All foundation subgrades should be vigorously densified with as large a vibratory compactor as is practical prior to placement of any new fill or concrete. Before the backfill or concrete is placed, all water and loose debris shall be removed from the excavations and the . Concrete placement should follow excavation and bearing surface examination as rapidly as practical.

The geotechnical engineer, or a designated representative, should examine footing excavation bottoms, prior to placement of reinforcing steel and concrete to evaluate suitability of the supporting soils, including confirmation that the new footings have been excavated in general alignment with the ground improvement or deep foundation elements.

New foundations and excavations adjacent to existing structures or utilities should be constructed outside a zone bounded by a 1H:1V plane from the base of the existing features to prevent undermining. Foundation subgrades subjected to freezing temperatures during construction and/or the life of the structure should be established at least 2.5 ft below adjacent exterior grades or otherwise protected against frost action.

Long term total and differential settlements for shallow spread footings or mat slabs founded over existing soils are estimated to be on the order of up to 12 inches or greater. Based on the subsurface conditions encountered within the depth of the borings, settlement should occur throughout the service life of the structures. Initial (elastic) settlements of the sandy fill material shortly after application of the loads will be on the order 1 ½ to 2 inches.

Footings bearing on ground improvement elements as described above may be sized to correspond to the improved allowable bearing capacity of the improved subgrade. After a properly designed and installed ground improvement such as RAPs or equivalent, total settlements on the order of 1 inch are expected to be feasible.

Building Floor Slab Design Considerations

The floor slab or mat slabs can be constructed as a slab-on-grade provided the subgrade is properly densified and subsequent lifts of structural backfill are compacted and tested in accordance with the recommendations included in this report. Due to the relatively shallow groundwater table and the likely development of perched water conditions during wet periods, it is recommended the floor slab bearing soils be covered with a 10-mil thick plastic sheet be considered to provide a moisture barrier to reduce moisture entry and floor dampness. Caution should be taken during placement of aggregate base course, reinforcing steel and concrete as not to damage or tear the membrane.

A minimum six (6) inch thick layer of granular, free draining aggregate base course (AASHTO No. 57) should be placed and compacted between the tops of all foundations and directly below the bottom of the floor slab on grade to provide a uniform bearing surface, improve overall slab performance, reduce the tendency for floor slab cracking at the foundation edges, and provide drainage. If the floor slab subgrade is prepared as recommended or founded in natural soils, floor slabs can be designed for a vertical modulus of subgrade reaction (k_s) on the order of 75 pci.

Site Preparation for Building Areas

The site earthwork contractor should proofroll the exposed subgrade soils within the proposed building areas using a fully loaded, rubber-tired tandem-axle dump truck (or equivalent) after performing site stripping, pavement removal, rough grading, and exposing the subgrade surface and prior to foundation, fill, pavement, or slab placement. The purpose of the proofroll is to identify potential soft, yielding near-surface subgrade areas. Soft spots identified during the proofroll should be undercut to firm, stable conditions or otherwise stabilized prior to placing controlled fill to finished subgrade elevation. The severity of soft/loose, very moist subgrade conditions will depend on the time of year earthwork is performed, and the amount of moisture within the subgrade soils.

After proofrolling, all areas to receive new fill, concrete slabs, pavements, and/or mat/floor slabs should be densified with a minimum 25 ton vibratory roller. A minimum 2 passes each in cross direction should be performed. In relatively small or narrow smaller excavations, such as for grade beams or the canopy structures, foundation subgrades should be densified with a walk behind vibratory plate or a vibrating plate attached to a backhoe, however, note that the effective compaction depth of smaller compaction equipment will be shallower. Any soft, loose, or otherwise unstable areas should be over-excavated to more competent material and replaced with a compacted fill.

Based on the observations from the exploration, the near surface onsite soil contain varying fines (silt) content on the order of 18% to 65% and can become unstable below construction equipment when wet or disturbed. Stabilization of loose sandy soils by recompaction may be feasible during drier times of year. During wet seasons, partial undercutting and replacement of wet soils with structural fill or use of geosynthetics (e.g., triaxial geogrids, woven fabrics, etc.) may be needed to create a stable subgrade.

Test the subgrade for compaction at a frequency of not less than one test per 2,500 square feet in each building area, or a minimum of three test locations per building, whichever is greater.

It is anticipated that the underground utilities will be installed several feet below existing grades and within the sand-silt soils. These soils, if excavated in a wet condition, may require spreading and drying prior to reuse to achieve a moisture content sufficient to obtain the recommended degree of compaction. Dewatering of the trench may be required, as discussed below.

Earthwork

We recommend normal, good practice site preparation procedures for the building and pavement areas. Based on our understanding of the proposed construction, significant grading and earthwork operations are not anticipated unless material removal and replacement would be considered for support of equipment foundations. It is recommended that the earthwork be performed during the "dry weather" season when the groundwater levels are normally at its lowest; however, periods of wet weather may occur during any month of the year. The following recommendations are provided based on the site soils encountered.

Any existing subsurface utilities which conflict with the proposed development should be removed or relocated, where applicable and excavations should be replaced with properly compacted fill, including the storm sewer/drainage easement to be relocated, as previously discussed. In areas of backfill placement and/or construction of shallow foundations, all concrete asphalt, topsoil, and organic or otherwise deleterious material should be removed within 5 feet beyond the perimeter of the proposed structure and pavement areas before foundation construction or new fill placement. Any obstructions such as old foundations and floor slabs that would interfere with new foundation construction must be removed in their entirety from a foundation location. Loose or unstable areas identified during the course of excavation should be densified in-place or excavated and replaced with compacted load bearing fill.

The natural surficial soils contain varying fines (silt) content and may be sensitive to moisture and disturbance. Therefore, they may lose considerable strength when wet and disturbed by construction equipment and could be difficult to work with during cooler or wet weather. Some drying of these soils should be anticipated before reuse in compacted backfills. Once a subgrade has been prepared, construction traffic should be controlled in such a fashion as to minimize subgrade disturbance.

Only inert, granular portions of the existing FILL soils are suitable for re-use as compacted, load-bearing fill provided they are free of organic inclusions, deleterious materials and any particles larger than 4 in. in diameter. Imported load-bearing fill, if required, should consist of well-graded granular material similar to GW or SW as identified by the Unified Soil Classification System (USCS), NJDOT I-5, DGA, or AASHTO #57 aggregate material which is not excessively moist and free of organic inclusions, frozen material, and any particles larger than 4 inches in diameter. Once a subgrade has been prepared, construction traffic should be controlled in such a fashion as to minimize subgrade disturbance.

All fills should be placed in horizontal layers not exceeding 8-inch loose thickness. This criterion may be modified in the field depending on the conditions present at the time of construction and on the compaction equipment used. Load-bearing fills for the support of foundations and slabs on grade should be compacted to not less than 98% of maximum dry density (ASTM D 698). Backfill of foundations and fills in paved areas or access roads, if required, should be compacted to not less than 98% of maximum dry density to a depth of at least 1 foot below the stripped surface and full depth of fill, or at least 2 feet below the bottom of base course (or concrete pavement) level, whichever is greater. Fills in landscaped areas should be compacted to at least 90% of maximum dry density.

Temporary Excavations

The sidewalls of confined excavations deeper than 4 ft must be sloped, benched or adequately shored per OSHA 29 CFR 1926 regulations. The onsite surficial fill soils are classified as Type C soils according to OSHA 29 CFR 1926. Open excavations in the existing surficial soils should not be steeper than 1.5H:1V if dry and 2H:1V if submerged or where considerable wetness is observed. Alternately, trench boxes and/or sheeting could be used in conjunction with open cut slopes to permit access to confined excavations.

Groundwater Management

Ground water may be anticipated to be encountered in standard shallow excavations (i.e. depths on the order of three to four feet). Surface runoff or perched water conditions may also be encountered at shallow depths during wet weather as previously discussed. Based on the potential for high water level conditions, control of the groundwater may be required to achieve the necessary excavation, construction, backfilling and compaction requirements as discussed herein. If groundwater or perched water seepage is encountered during construction, standard sumps and pumps, or, if necessary, well points, should be sufficient to maintain dry working conditions. TRC recommends drawing down the water level at least two (2) feet below the bottom of the excavations. Excavations for deeper utilities may require dewatering in conjunction with sheeting and shoring. The means and methods of dewatering should be determined by the contractor.

Lateral Earth Pressures

The unfactored soil parameters summarized in Table 1 below may be used to estimate the lateral earth pressures on below-grade features, including backfill and for temporary excavation support. These values assume the backfill is placed in horizontal lifts and that any surcharge loading would need to be considered.

Table 1: Summary of Lateral Earth Pressure Soil Parameters

Soil Parameter	Existing FILL	SILT	SAND	Imported Fill
γ (pcf)	115	100	125	130
ϕ (degrees)	26	10	32	34
δ_{steel}	14	0	17	17
$\delta_{concrete}$	19	0	24	29
K_o	0.56	0.82	0.47	0.44
K_a	0.39	0.70	0.31	0.28
K_p	2.56	1.42	3.25	3.54

At-rest earth pressures (K_o) and the active earth pressure (K_a) should be used in the design of non-yielding and yielding structures, respectively. We recommend that the passive earth pressure (K_p) be neglected in the zone of 3 ft below proposed grade in the design of sliding resistance due to potential disturbance during construction activities and softening and saturation of the soil at the ground surface. Backfill behind foundations and other structures should be placed with light equipment and the soils should not be over-compacted. Heavy compaction equipment and compactive effort may lead to overstress of the structures.

Pavement Design Considerations

Based on the results of the geotechnical exploration and the laboratory testing, either a rigid (concrete) or flexible (asphalt) pavement section could be used for this project provided the subgrade is prepared as discussed below. Flexible pavement utilizing asphalt components appropriate to the Site climate combines the strength and durability of several layer components to produce an appropriate and cost-effective combination of available construction materials. Concrete pavement has the advantage of the ability to "bridge" over isolated soft areas and it typically has a longer service life than asphalt pavement. Disadvantages of rigid pavement include a higher initial cost and more difficult patching of distressed areas than occurs with flexible pavement.

Based on the soil boring data, it is anticipated that the pavement subgrade will consist of granular silty sand and sandy silt material. The subgrade may require some moisture control to facilitate compaction. ***A (plate) modulus of subgrade reaction (K) for short-term loadings over small areas of 100 pci may be assumed for rigid pavement design for a properly densified subgrade.*** **The design for asphalt pavement should assume that the contractor will provide stabilized subgrade to achieve an assumed California Bearing Ratio (CBR) value of 5%** based on engineering correlations for the properly prepared subgrade soils for pavement design purposes based on existing granular fill soils and our experience with similar conditions. This is recommended if the subgrade is compacted and prepared as outlined below.

TRC recommends that a minimum 6-inch thick base course (or 8 inches for heavy duty pavement) material for the ***new flexible pavement areas*** consist of NJ DOT I-5 subbase material or equivalent. Place subbase in maximum 6-inch lifts and compact each lift to a minimum density of 98 percent of the Standard Proctor maximum dry density. As an alternative base course, recycled crushed concrete could be used, if available at the time of construction. An advantage to using crushed concrete is a lower sensitivity to water, Crushed concrete should be supplied by an NJ DOT approved plant with appropriate quality control procedures. Crushed concrete shall not contain extremely hard pieces, lumps, balls or pockets of sand or clay sized material in sufficient quantity as to be detrimental to the proper binding, finishing or strength of the crushed concrete base.

Site Preparation for New Pavement Areas

Initial site preparation for paved areas (consisting of proofrolling, densification over large areas, and stabilization, where required) as discussed previously for building areas should also be performed for areas of proposed pavement. The following additional preparation specific to pavement areas is also recommended.

Prior to the placement of the base course within the asphaltic pavement areas, densify the exposed subgrade soils in place using as large a compactor as is practical. Densify the subgrade materials to a minimum CBR of 5. The subgrade material should be compacted to at least 98 percent of the Standard Proctor maximum dry density (ASTM D698).

Soil density testing to verify the uniformity of compactive efforts for pavement areas should be performed at a frequency of at least one (1) test for every 5,000 square feet per foot of compacted increment, or at a minimum of two test locations, whichever is greater.

Site Seismicity

Part of the International Building Code (IBC) procedure to evaluate seismic forces requires the evaluation of the Seismic Site Class, which categorizes the site based upon the characteristics of the subsurface profile within the upper 100 feet of the ground surface. To define the Seismic Site Class for this project, we have interpreted the results of our soil test borings drilled within the project site and estimated appropriate soil properties below the base of the test borings to a depth of 100 feet, as permitted by the IBC. Based upon our evaluation, it is our opinion that the subsurface conditions within the site are generally consistent with the characteristics of Site Class E as listed in Chapter 16, Section 1613.2.2 of the 2018 edition of the IBC and as defined in Table 20.3-1, Chapter 20 of ASCE 7. The maximum considered earthquake ground motions in this area for 0.2 sec. and 1.0 sec. spectral responses are approximately 22.2 % g and 5.1 % g, respectively, for Site Class B. For Site Class E, the adjusted maximum design earthquake ground motions at the project site for 0.2 and 1.0 sec. spectral responses SM_S and SM_1 are 53.4 % g and 21.6 % g, respectively based on seismic site coefficients F_a equal to 2.4 and F_v equal to 4.2. Corresponding 0.2 and 1.0 sec. design spectral response acceleration parameters SD_S and SD_1 are 35.6 % g and 14.4 % g, respectively

RECOMMENDATIONS FOR FURTHER SERVICES

We recommend that qualified personnel be retained to provide engineering consultation, field inspection, and construction material testing services during construction operations to determine if soils, other materials, and ground water conditions encountered during construction are similar to those encountered in the borings, and that they have comparable engineering properties and influences on the design of the structures. A qualified geotechnical engineer should review foundation design submittals and specifications for foundation construction when they are prepared.

LIMITATIONS

This work has been done in accordance with our authorized scope of work and in accordance with generally accepted practice in the fields of geotechnical and foundation engineering. This warranty is in lieu of all other warranties either expressed or implied. Our conclusions and recommendations are based on the data revealed by this exploration. We are not responsible for any conclusions or opinions drawn from the data included herein, other than those specifically stated, nor are the recommendations presented in this report intended for direct use as construction specifications. This report is intended for use with regard to the specific project discussed herein and any changes in loads, structures, or locations should be brought to our attention so that we may determine how they may affect our conclusions. An attempt has been made to provide for normal contingencies, but the possibility remains that unexpected conditions may be encountered during construction. If this should occur, or if additional or contradictory data are revealed in the future, we should be notified so that modifications to this report can be made, if necessary. If we do not review the relevant construction documents and witness the relevant construction operations, then we cannot be responsible for any problem, which may arise, from the misunderstanding or misinterpretation of this report or failure to comply with our recommendations.

We trust that this letter contains the information you require and thank you for the opportunity to assist you on this project. If you have any questions, or if we may be of further assistance, please call Dale Allison.

Respectfully submitted,
TRC Engineers, Inc. *for* TRC Environmental

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Attachments: Boring Location Site Plan, Boring Logs, and Laboratory Test Results

ATTACHMENT A: BORING LOCATION SITE PLAN

Project No.	514613.0000
Date:	November 28,2022
For:	Amsdell Construction, Inc.

TRC
16000 Commerce Parkway, Mt. Laurel, New Jersey 08054
PH. (856) 273-1224 FAX. (856) 273-9244

APPROXIMATE TEST BORING LOCATIONS

Compass Self Storage Facility Expansion

1109 N. 9th Ave., Neptune, New Jersey

FIGURE

1

ATTACHMENT B: BORING LOGS

TEST BORING LOG

BORING	**B-1**
G.S. ELEV.	
FILE	514613
SHEET	1 OF 1

PROJECT: COMPASS SELF STORAGE FACILITY REPLACEMENT
LOCATION: 1109 N. NINTH AVENUE, NEPTUNE, NJ

GROUNDWATER DATA			
FIRST ENCOUNTERED 6.0 ' ▽			
DEPTH	HOUR	DATE	ELAPSED TIME

METHOD OF ADVANCING BOREHOLE					
a	FROM	0.0 '	TO	10.0 '	
d	FROM	10.0 '	TO	25.0 '	

DRILLER: K. RYAN
HELPER: FM&W
INSPECTOR: N.MARTIN
DATE STARTED: 11/04/2022
DATE COMPLETED: 11/04/2022

DEPTH	A	B	C	DESCRIPTION	REC	REMARKS
				0.5 ***ASPHALT AND SUB-BASE***		BACKFILLED WITH SOIL CUTTINGS & TOPPED WITH AN ASPHALT COLD PATCH
	S-1	4 4 7				
	S-2	3 3 3 2		***BLACK SILTY F/M/C SAND, SM F/ GRAVEL, TR CLAY, TR BRICK & GLASS DEBRIS (FILL)***		
5						
▽	S-3	1 1 1 3		6.0		
	S-4	3 2 1 3				
10	S-5	2 2 3 4		***BLACK SILT, TR F/M SAND -POSSIBLE ORGANIC SILT***		
15	S-6	3 4 4 8		15.0		
20	S-7	15 19 20 20		***DARK GRAY F/M/C SAND, TR SILT***		
				23.5		
25	S-8	5 4 9 12		***DARK GRAY SILT, TR F/ SAND, TR CLAY*** 25.0		
				END OF BORING AT 25'		
30						
35						

DRN. JJM
CKD. JPB

NEW PROJECTS TEST BORING LOG 514613 AMSDELL NEPTUNE NJ.GPJ SITE BLAUVELT.GDT 11/28/22

TEST BORING LOG

BORING	B-2
G.S. ELEV.	
FILE	514613
SHEET	1 OF 1

PROJECT: COMPASS SELF STORAGE FACILITY REPLACEMENT
LOCATION: 1109 N. NINTH AVENUE, NEPTUNE, NJ

GROUNDWATER DATA

FIRST ENCOUNTERED 7.0 ' ▽

DEPTH	HOUR	DATE	ELAPSED TIME

▼

METHOD OF ADVANCING BOREHOLE

a	FROM 0.0 '		TO	10.0 '
d	FROM 10.0 '		TO	35.0 '

DRILLER K. RYAN
HELPER FM&W
INSPECTOR N.MARTIN
DATE STARTED 11/04/2022
DATE COMPLETED 11/04/2022

DEPTH	A	B	C	DESCRIPTION	REC	REMARKS
			1.0	*ASPHALT AND SUB-BASE*		BACKFILLED WITH SOIL CUTTINGS & TOPPED WITH AN ASPHALT COLD PATCH
	S-1	6 7	2.0	*BLACK SILTY F/M/C SAND, TR CLAY, TR BRICK DEBRIS (FILL)*		
	S-2	9 9 4 3				
5				*DARK GRAY ELASTIC SILT, TR F/M/C SAND -POSSIBLE ORGANIC SILT*		
	S-3	1 1 1 1				
▽	S-4	1 1 4 3	8.0			
10	S-5	-		*DARK GRAY F/M/C SAND, TR GRAVEL, TR SILT*		
			11.5			
15	S-6	2 6 4 5				
				BLACK ELASTIC SILT, TR SAND -POSSIBLE ORGANIC SILT		
20	S-7	4 5 7 9				
			21.0			
				DARK GRAY F/M/C SAND, TR SILT		
25	S-8	11 14 14 12				
			26.0			
				BLACK SILT, TR F/M SAND		
30	S-9	5 7 11 12				
			32.0			
				GRAY F/M SAND, TR CLAY, TR SILT		
35	S-10	7 10 11 12	35.0			

END OF BORING AT 35'

DRN. JJM
CKD. JPB

TRC

TEST BORING LOG

BORING B-3
G.S. ELEV.
FILE 514613
SHEET 1 OF 1

PROJECT: COMPASS SELF STORAGE FACILITY REPLACEMENT
LOCATION: 1109 N. NINTH AVENUE, NEPTUNE, NJ

GROUNDWATER DATA				
FIRST ENCOUNTERED 7.0 '				▽
DEPTH	HOUR	DATE	ELAPSED TIME	
				▼

METHOD OF ADVANCING BOREHOLE				
a	FROM 0.0 '	TO	10.0 '	
d	FROM 10.0 '	TO	25.0 '	

DRILLER K. RYAN
HELPER FM&W
INSPECTOR N.MARTIN
DATE STARTED 11/04/2022
DATE COMPLETED 11/04/2022

DEPTH		A	B	C	DESCRIPTION	REC	REMARKS
					0.7 ***ASPHALT AND SUB-BASE***		BACKFILLED WITH SOIL CUTTINGS & TOPPED WITH AN ASPHALT COLD PATCH AUGER REFUSAL AT 4 FT (BRICK DEBRIS); BORING OFFSET APPROX 2 FT
		S-1	12 7		***BROWN SILTY F/M SAND, TR CLAY, TR GRAVEL-SIZED BRICK DEBRIS (FILL)***		
		S-2	4 50/2"		4.0		
5		S-3	1 1 1 1				
▽		S-4	3 2 3 3				
10		S-5	2 2 3 3		***DARK GRAY F/ SANDY SILT -POSSIBLE ORGANIC SILT***		
15		S-6	2 2 3 5		16.0		
20		S-7	3 4 5 4		***GRAY F/M/C SAND, TR SILT*** 20.0		
25		S-8	2 3 4 9		***DARK GRAY SILT, TR F/ SAND*** 25.0		
					END OF BORING AT 25'		
30							
35							

DRN. JJM
CKD. JPB

NEW PROJECTS TEST BORING LOG 514613 AMSDELL NEPTUNE NJ.GPJ SITE BLAUVELT.GDT 11/28/22

TEST BORING LOG

BORING B-4
G.S. ELEV.
FILE 514613
SHEET 1 OF 1

PROJECT: COMPASS SELF STORAGE FACILITY REPLACEMENT
LOCATION: 1109 N. NINTH AVENUE, NEPTUNE, NJ

GROUNDWATER DATA

FIRST ENCOUNTERED 7.0 ' ▽

DEPTH	HOUR	DATE	ELAPSED TIME	
15.0'	NR	11/4	0 HR	▼
				▽

METHOD OF ADVANCING BOREHOLE

a	FROM	0.0 '	TO	10.0 '
d	FROM	10.0 '	TO	25.0 '

DRILLER K. RYAN
HELPER FM&W
INSPECTOR N.MARTIN
DATE STARTED 11/04/2022
DATE COMPLETED 11/04/2022

DEPTH	A	B	C	DESCRIPTION	REC	REMARKS
				0.5 ***TOPSOIL***		
	S-1	1 1 3 1				
	S-2	1 1 2 1		***BROWN F/M/C SAND, TR TO SM SILT, TR GRAVEL***		
5						
	S-3	1 1 2 2		6.0		
▽						
	S-4	1 2 2 4				
10	S-5	2 3 4 7		***BLACK SILT, TR F/M/C SAND, TR GRAVEL***		
▼ 15	S-6	2 2 4 4		15.0		
20	S-7	5 5 12 14		***F/M/C SAND, TR SILT***		
25	S-8	5 5 12 14		25.0		
				END OF BORING AT 25'		
30						
35						

DRN. JJM
CKD. JPB

NEW PROJECTS TEST BORING LOG 514613 AMSDELL NEPTUNE NJ.GPJ SITE BLAUVELT.GDT 11/28/22

KEY TO SYMBOLS

Strata symbols

Symbol	Description
■	Asphalt
▩	Fill (made ground)
▥	Silt with High Plasticity
▥	Silt with Low Plasticity
▥	Silty Sand
▒	Poorly-graded Sand
▒	Topsoil

Misc. Symbols

Symbol	Description
▽	Water table first encountered
▼	Water table first reading after drilling
▽	Water table second reading after drilling
▽	Water table third reading after drilling
NR	Not Recorded
MH	Moh's Hardness

Sample Type

Symbol	Description
▯	Split Barrel

Lab Symbols

FINES = Fines %

LL = Liquid Limit %

PI = Plasticity Index %

U_c = Unconfined Compressive Strength

W/V = Unit Weight

Notes:

COLUMN A) Soil sample number.

COLUMN B) FOR SOIL SAMPLE (ASTM D 1586): indicates number of blows obtained for each 6 ins. penetration of the standard split-barrel sampler. FOR ROCK CORING (ASTM D2113): indicates percent recovery (REC) per run and rock quality designation (RQD). RQD is the % of rock pieces that are 4 ins. or greater in length in a core run.

COLUMN C) Strata symbol as assigned by the geotechnical engineer.

DESCRIPTION) Description including color, texture and classification of subsurface material as applicable (see Descriptive Terms). Estimated depths to bottom of strata as interpolated from the borings are also shown.

DESCRIPTIVE TERMS: F = fine M = medium C = coarse

RELATIVE PROPORTIONS:

-Descriptive Term-	-Symbol-	-Est. Percentages-
Trace	TR	1-10
Trace to Some	TR to SM	10-15
Some	SM	15-30
Silty, Sandy, Clayey, Gravelly	-	30-40
And	and	40-50

REMARKS) Special conditions or test data as noted during investigation. Note that W.O.P. indicates water observation pipes.

* Free water level as noted may not be indicative of daily, seasonal, tidal, flood, and/or long term fluctuations.

METHODS AND TOOLS FOR **ADVANCING BOREHOLES**

a - Continuous Sampling

b - Finger type rotary cutter head 6 in. diameter (open hole)

d - Drilled in casing 3 3/8 in. ID; 8 in. OD (hollow-stem auger)

e - Drilled in casing 2 1/2 in. ID; 6 1/4 in. OD (hollow-stem auger)

f - Driven flush joint casing (BW) - 2 3/8 in. ID; 2 7/8 in. OD (300 lb. hammer, 18 in. drop)

g - Driven flush joint casing (NW) - 3 in. ID; 3 1/2 in. OD (300 lb. hammer, 18 in. drop)

h - Tricone Roller Bit - 2 3/8 in. or 2 7/8 in.

i - Drilling Mud (Slurry Method)

c_1 - Double tube diamond core barrel (BX) : core size: 1.6 in.
hole size: 2.36 in.

c_2 - Double tube diamond core barrel (NX) : core size: 2.0 in.
hole size: 2.98 in.

c_3 - 4 in. thin walled diamond bit

c_4 - 6 in. thin walled diamond bit

METHODS AND TOOLS FOR **TESTING AND SAMPLING SOILS AND/OR ROCKS**

Penetration test and split-barrel sampling of soils, ASTM D1586

140 lb. hammer, 30 in. drop. recording number of blows obtained for each 6 in. penetration usually for a total of 18 in. penetration of the standard 2 in. O.D. and 1 3/8 in. I.D. split-barrel sampler. Penetration resistance (N) is the total number of blows required for the second and third 6 in. penetration.

Thin walled tube sampling, ASTM D1587

Samples are obtained by pressing thin-walled steel, brass or aluminum tubes into soil. Standard thin-walled steel tubes:

O.D. in.	2	3
I.D. in.	1.94	2.87

Diamond core drilling, ASTM D2113

Diamond core drilling is used to recover intact samples of rock and some hard soils generally with the use of a:

BWM double tube core barrel
NWM double tube core barrel

TRC

ATTACHMENT C: LABORATORY TEST RESULTS

SUMMARY OF LABORATORY TEST DATA

Project Name: 1109 9th Ave., Neptune, NJ
Client Name: Amsdell Construction, Inc.
TRC Project #: 514613

SAMPLE IDENTIFICATION			Soil Group (USCS System)	Moisture Content (%)	GRAIN SIZE DISTRIBUTION				PLASTICITY			
Source #	Sample #	Depth (ft)			Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Liquidity Index (%)
B-1	S-2 & S-3	2.0-6.0	SM	29.2	16.1	48.0	35.9		-	-	-	-
B-1	S-4 & S-5	6.0-10.0	ML/OL[1]	35.8	-	-	-		42	29	13	0.5
B-2	S-3 & S-4	4.0-8.0	MH/OH[1]	60.0	-	-	-		135	73	62	-0.2
B-2	S-6 & S-7	13.0-20.0	MH/OH[1]	38.7	-	-	-		50	33	17	0.3
B-2	S-8	23.0-25.0	SP	17.9	0.0	95.5	4.5		-	-	-	-
B-3	S-4	6.0-8.0	ML/OL[2]	32.7	0.0	35.0	65.0		-	-	-	-
B-3 & B-4	S-7	18.0-20.0	SP	17.9	0.1	96.6	3.3		-	-	-	-
B-4	S-2 & S-3	2.0-6.0	SM[2]	14.2	2.5	79.3	18.2		-	-	-	-
B-4	S-4 & S-5	7.0-10.0	ML[1]	33.2	-	-	-		42	29	13	0.3

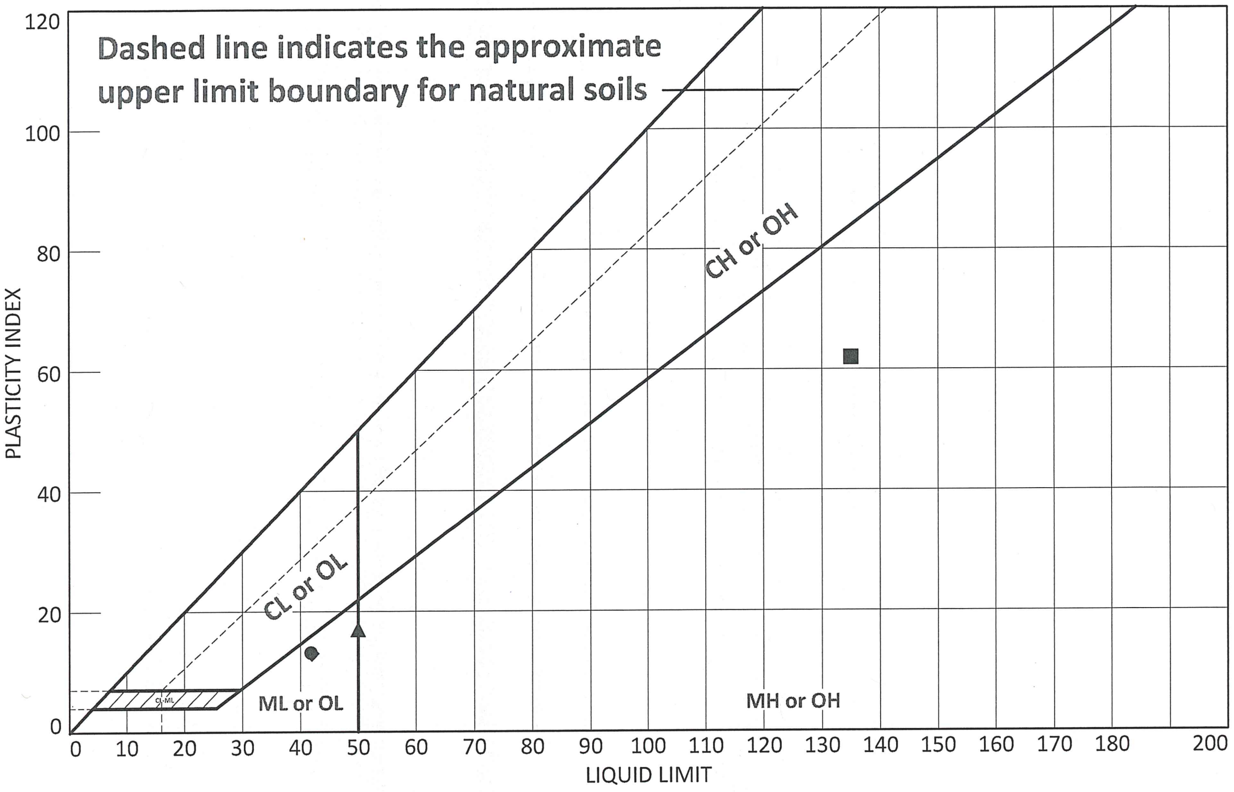
Notes:

1. USCS based on fines only and visual classification. No grain size analysis was requested to be completed.
2. USCS based on visual classification.

DRAWN BY: TBT 11/23/22

CHECKED BY: JPB 11/23/22

LIQUID AND PLASTIC LIMITS TEST REPORT



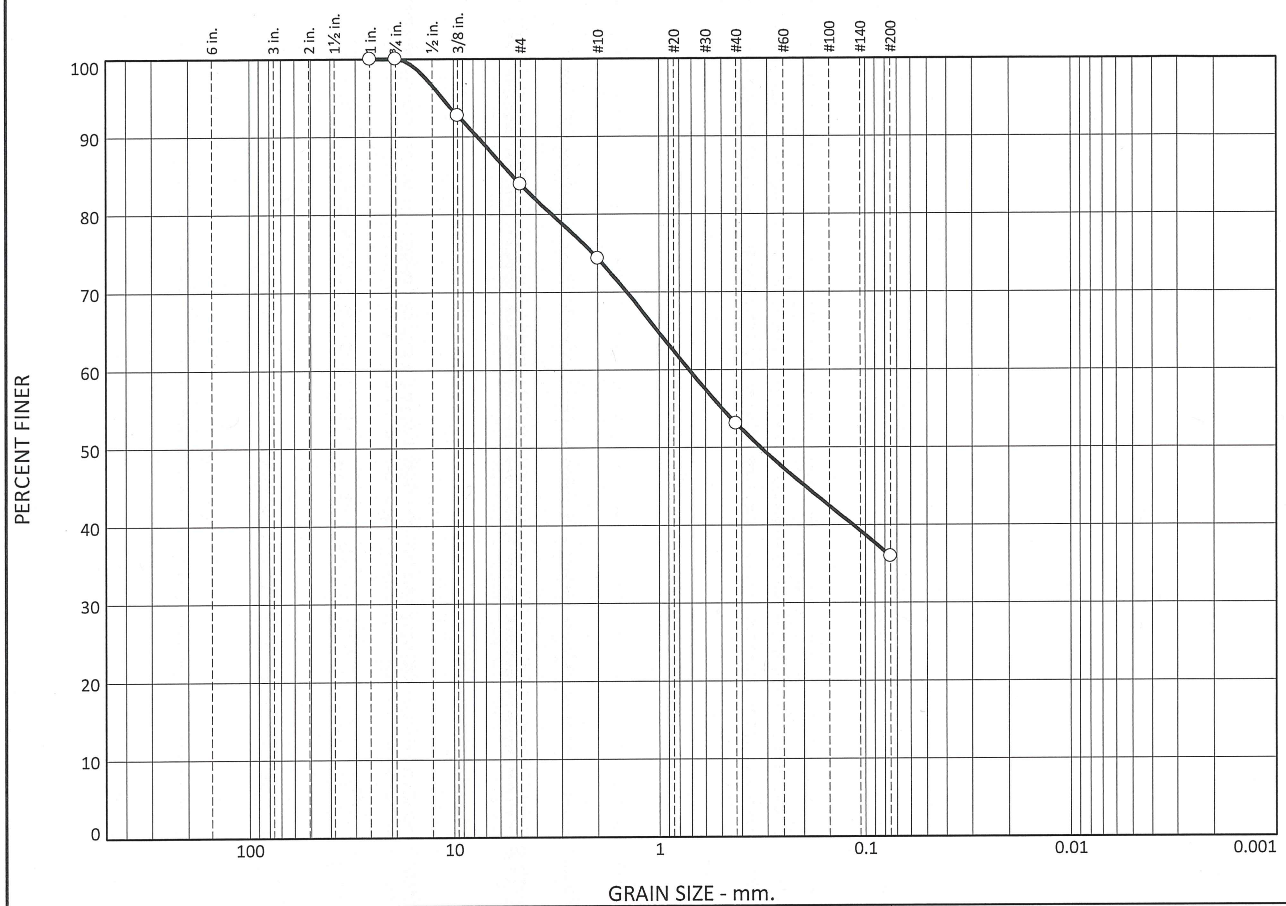
SOIL DATA

	SOURCE	SAMPLE NO.	DEPTH	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●	B-1	S-4 & S-5	6.0-10.0 FT	35.8	29	42	13	ML/OL*
■	B-2	S-3 & S-4	4.0-8.0 FT	60.0	73	135	62	MH/OH*
▲	B-2	S-6 & S-7	13.0-20.0 FT	38.7	33	50	17	MH/OH*
◆	B-4	S-4 & S-5	7.0-10.0 FT	33.2	29	42	13	ML*

TRC
Engineers, Inc.
Mt. Laurel, NJ

Client: AMSDELL CONSTRUCTION, INC.
Project: 1109 9TH AVE, NEPTUNE, NJ
Project No.: 514613 **Figure** 1

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines
		Coarse	Fine	Coarse	Medium	Fine	
○	0.0	0.0	16.1	9.6	21.2	17.2	35.9

☒	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			5.2104	0.7189	0.3234					

MATERIAL DESCRIPTION	TEST DATE	USCS	NM
○ DARK BROWN TO BROWN SILTY SAND WITH GRAVEL*	11/21/22	SM	29.2

Project No. 514613 **Client:** AMSDELL CONSTRUCTION, INC.
Project: 1109 9TH AVE, NEPTUNE, NJ

○ **Source of Sample:** B-1 **Depth:** 2.0-6.0 FT **Sample Number:** S-2 & S-3

TRC Engineers, Inc.

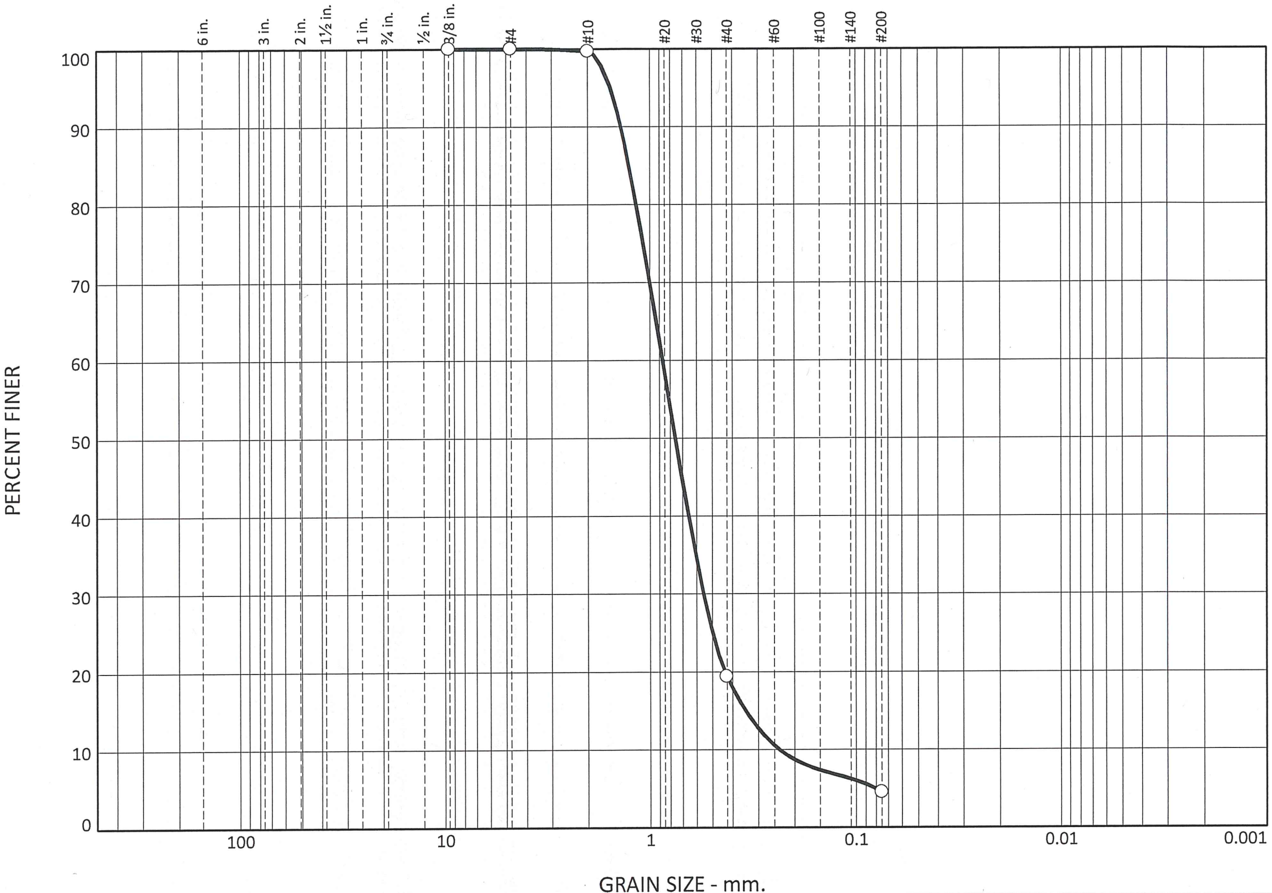
Mt. Laurel, NJ

Remarks:
○SAMPLE DESCRIPTION BASED ON USCS & VISUAL CLASSIFICATION
*SPECIMEN CONTAINED GLASS FRAGMENTS
F.M.=2.31

Figure 2

Tested By: JC 11/21/22 **Checked By:** JPB 11/23/22

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines
		Coarse	Fine	Coarse	Medium	Fine	
○	0.0	0.0	0.0	0.3	80.3	14.9	4.5

☒	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			1.2677	0.8706	0.7570	0.5530	0.3460	0.2365	1.49	3.68

MATERIAL DESCRIPTION	TEST DATE	USCS	NM
○ GRAY POORLY GRADED SAND	11/21/22	SP	17.9

Project No. 514613 **Client:** AMSDELL CONSTRUCTION, INC.

Project: 1109 9TH AVE, NEPTUNE, NJ

○ **Source of Sample:** B-2 **Depth:** 23.0-25.0 FT **Sample Number:** S-8

Remarks:
○SAMPLE DESCRIPTION
BASED ON USCS & VISUAL
CLASSIFICATION
F.M.=2.65

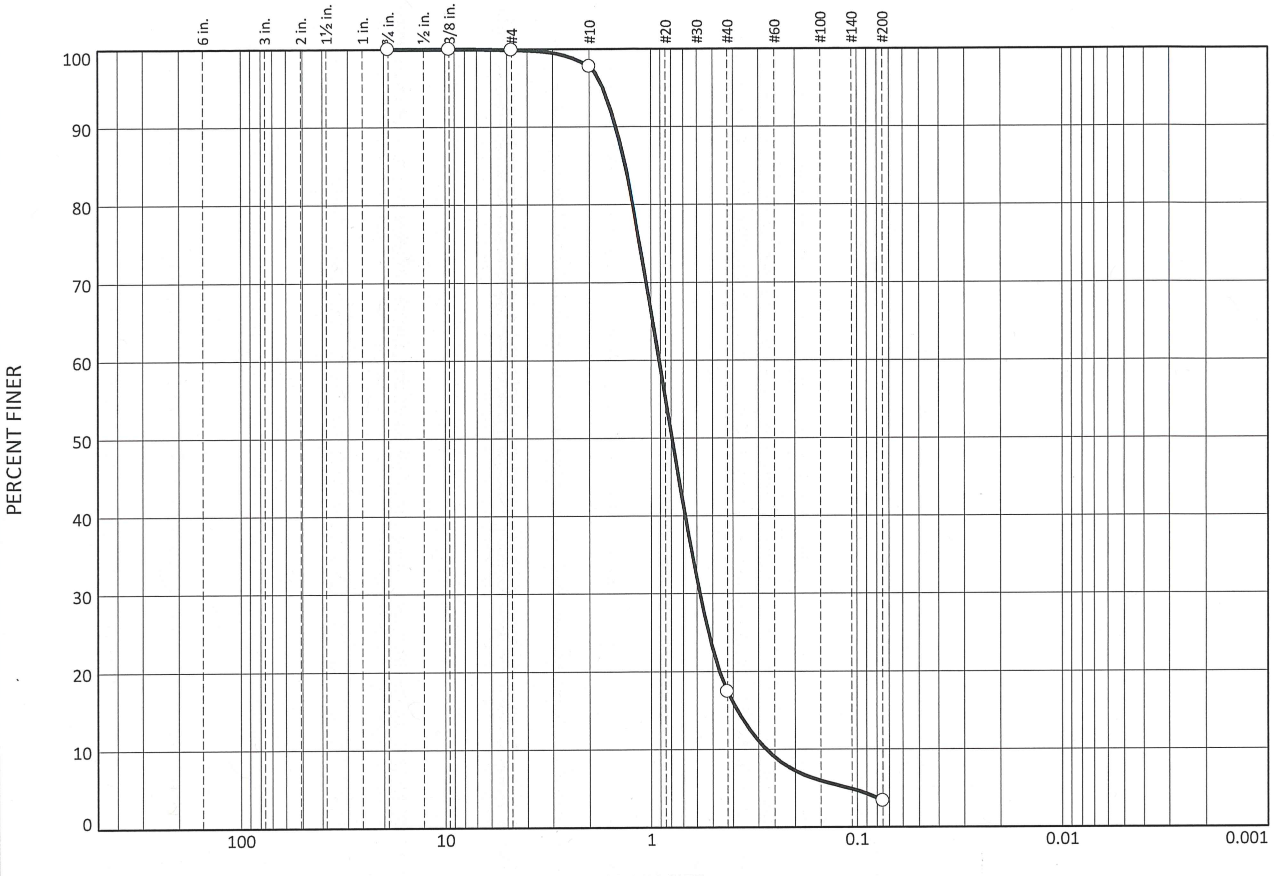
TRC Engineers, Inc.

Mt. Laurel, NJ

Figure 3

Tested By: JC 11/21/22 **Checked By:** JPB 11/23/22

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines
		Coarse	Fine	Coarse	Medium	Fine	
○	0.0	0.0	0.1	2.2	80.3	14.1	3.3

☒	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			1.3514	0.9133	0.7919	0.5789	0.3804	0.2756	1.33	3.31

MATERIAL DESCRIPTION	TEST DATE	USCS	NM
○ GRAY POORLY GRADED SAND	11/22/22	SP	17.9

Project No. 514613 **Client:** AMSDELL CONSTRUCTION, INC.
Project: 1109 9TH AVE, NEPTUNE, NJ

○ **Source of Sample:** B-3 & B-4 **Depth:** 18.0-20.0 FT **Sample Number:** S-7

TRC Engineers, Inc.

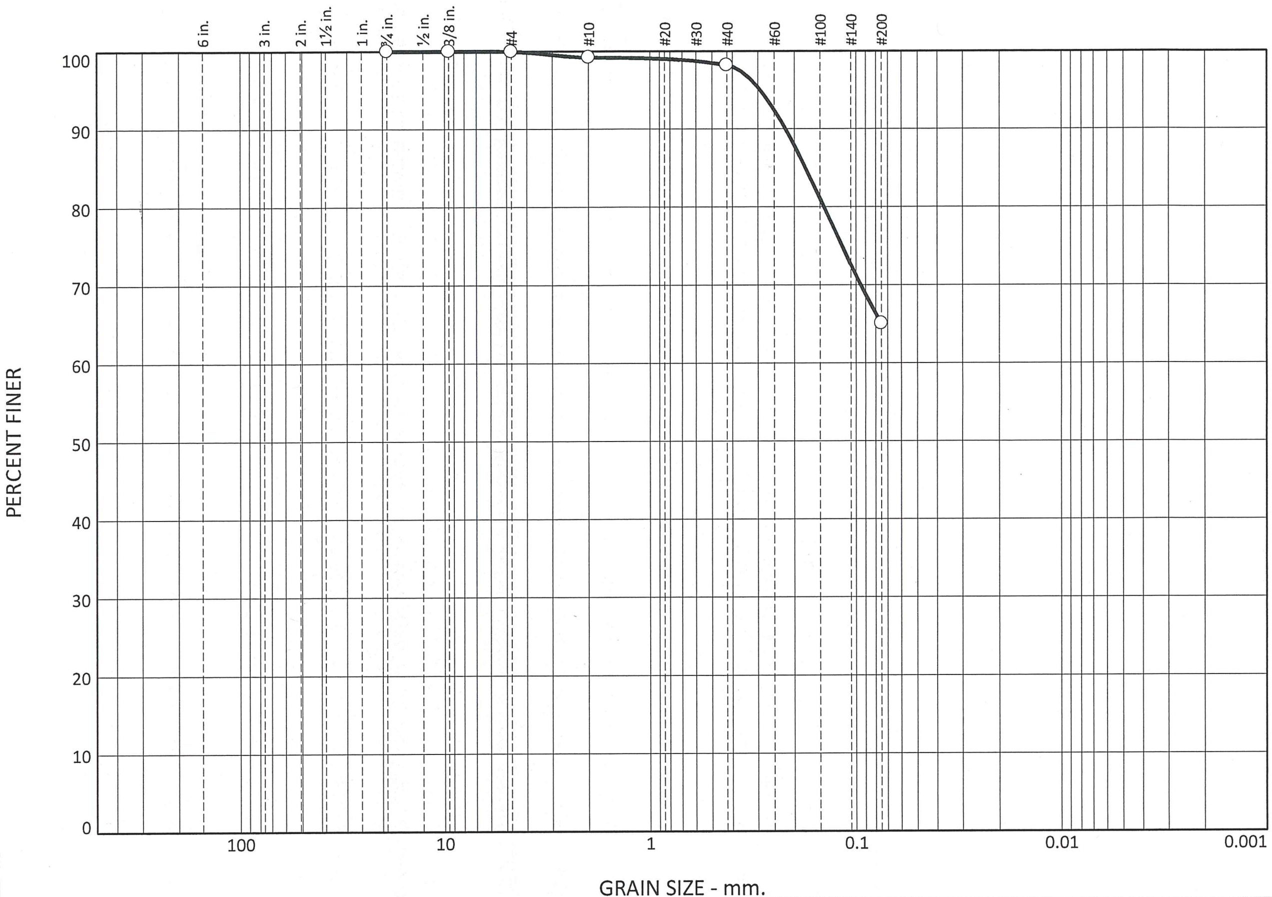
Mt. Laurel, NJ

Remarks:
○SAMPLE DESCRIPTION BASED ON USCS & VISUAL CLASSIFICATION
F.M.=2.75

Figure 4

Tested By: JC 11/22/22 **Checked By:** JPB 11/23/22

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines
		Coarse	Fine	Coarse	Medium	Fine	
○	0.0	0.0	0.0	0.8	1.0	33.2	65.0

☒	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.1761							

MATERIAL DESCRIPTION	TEST DATE	USCS	NM
○ DARK GRAY SANDY SILT/ORGANIC SILT*	11/21/22	ML/OL*	32.7

Project No. 514613 **Client:** AMSDELL CONSTRUCTION, INC.

Project: 1109 9TH AVE, NEPTUNE, NJ

○ **Source of Sample:** B-3 **Depth:** 6.0-8.0 FT **Sample Number:** S-4

TRC Engineers, Inc.

Mt. Laurel, NJ

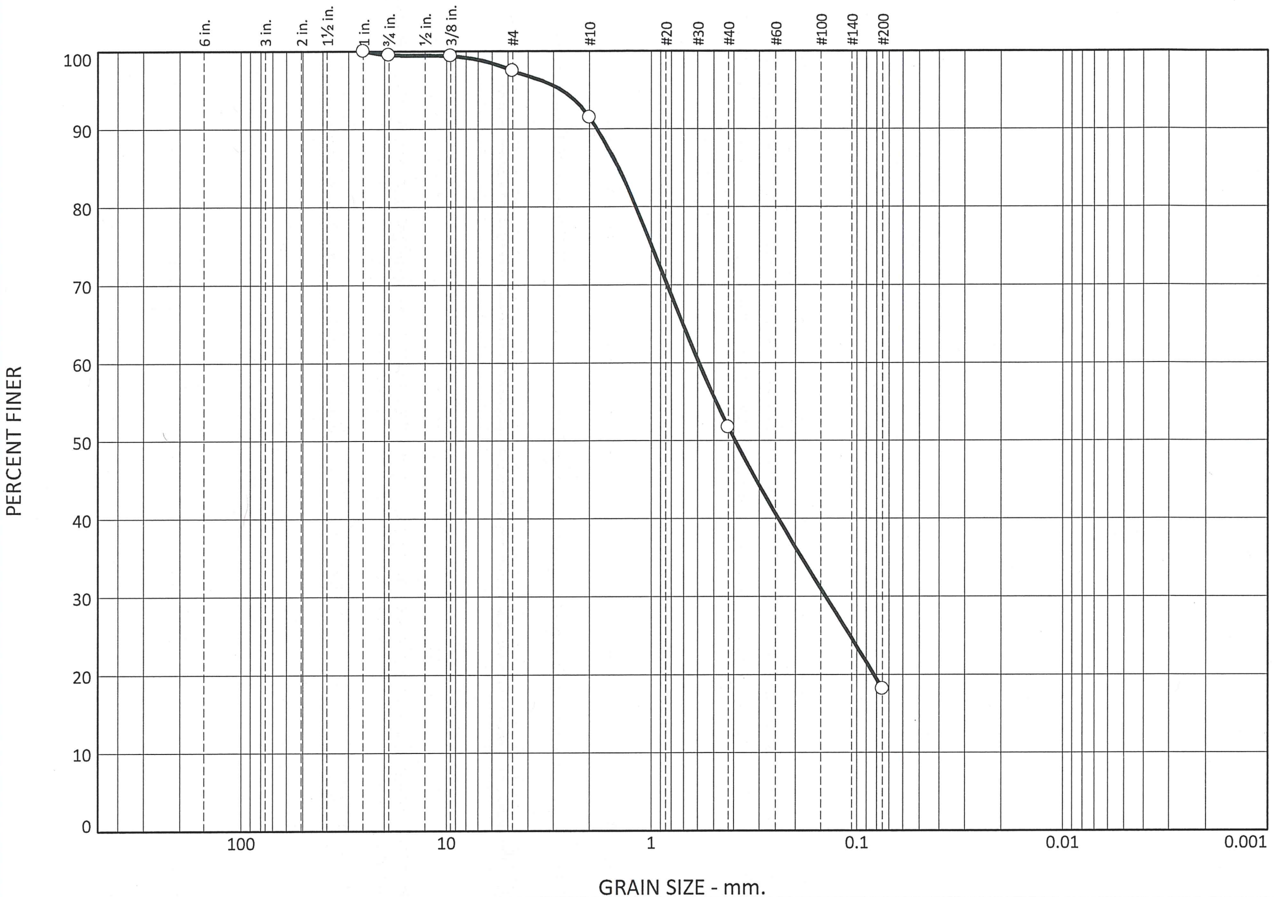
Remarks:

○SAMPLE DESCRIPTION BASED ON USCS & VISUAL CLASSIFICATION
*SPECIMEN VISUALLY APPEARED TO BE AN ORGANIC SILT

Figure 5

Tested By: JC 11/21/22 **Checked By:** JPB 11/23/22

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines
		Coarse	Fine	Coarse	Medium	Fine	
○	0.0	0.5	2.0	6.0	39.8	33.5	18.2

☒	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			1.4547	0.5902	0.3936	0.1418				

MATERIAL DESCRIPTION	TEST DATE	USCS	NM
○ BROWN TO DARK BROWN SILTY SAND	11/22/22	SM	14.2

Project No. 514613 **Client:** AMSDELL CONSTRUCTION, INC.
Project: 1109 9TH AVE, NEPTUNE, NJ

○ **Source of Sample:** B-4 **Depth:** 2.0-6.0 FT **Sample Number:** S-2 & S-3

Remarks:
○SAMPLE DESCRIPTION
BASED ON USCS & VISUAL
CLASSIFICATION
F.M.=1.95

TRC Engineers, Inc.

Mt. Laurel, NJ

Figure 6

Tested By: JC 11/22/22 **Checked By:** JPB 11/23/22