Geotechnical Engineering Report
Proposed CareOne Assisted Living Facility

Prepared For:
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Location:
Block 6601 Lot 2
3641 Lawrenceville Road
Lawrenceville Township, Mercer County, New Jersey 08540

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Job Number: 61-150
Date: June 24, 2022

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ATTACHMENTS

1. INTRODUCTION

This report was prepared by RPM Engineering, LLC (RPM), on behalf of T&M Associates (T&M), of Middletown, New Jersey, and contains the results of a subsurface geotechnical investigation conducted at the location of a proposed Assisted Living Facility. The purpose of this investigation was to assess the suitability of the existing subsurface soil conditions to support the proposed structure. Our scope of work included a subsurface exploration, a laboratory testing program, and geotechnical engineering analyses. This report summarizes the work completed and provides foundation recommendations along with our general construction recommendations.

2. SITE & PROJECT DESCRIPTION

2.1 EXISTING CONDITIONS

The project site, locally known as Block 6601 and Lot 2, is located at 3641 Lawrenceville Road in Lawrenceville Township, Mercer County, New Jersey (see Attachment A – *Key Map Plan*). The area of the proposed assisted living facility consists of a wooded area with occasional grass fields. An existing historic residential building and garage resides on the northeastern portion of the property. The project site was bordered to the southeast by Lawrenceville Road, to the northeast by Province Line Road, and on all other sides by commercial property. Topography across the site generally sloped upward from southwest to northeast, with site elevations ranging from approximately Elevation (EL) 161 feet to EL 173 feet. Vertical elevations are referenced to the North American Vertical Datum of 1988 (NAVD88).

2.2 PROJECT DESCRIPTION

The proposed development scheme is expected to consist of the construction of a new 3-story assisted living facility encompassing approximately 39,000 square feet in plan area. It was reported to us that a partial basement, encompassing approximately 4,800 SF, will be underlying a portion of the southwestern footprint as well. This structure is expected to be of conventional masonry and steel frame construction. The proposed development scheme will also consist of the construction of new parking areas and drive lanes, as well as new underground stormwater management facilities associated with the proposed site improvement. Additionally, the project is to include the relocation of the existing residential building, currently situated within the proposed building footprint, further northeast on the property.

The planned finished floor elevation (FFE) for the first floor of the building is EL 172 feet. The planned partial basement slab is to be approximately 12 feet below the FFE. Therefore, based on the existing grades, cuts and fills across the proposed building footprint will be up to approximately 2 feet, with the exception of the proposed partial basement, which is to have a cut of approximately 12 feet.

Structural loading information was not available at the time of this report. However, based on the type and size of the proposed construction, column loads of approximately 200 kips and wall loads of approximately 5 kips per linear foot were assumed. Should the actual loads differ from these assumed values, RPM shall be contacted so that our conclusions and recommendations can be reviewed and revised, if necessary.

3. GEOLOGY

Based on the Surficial Geologic Map of New Jersey, the site is underlain by Weathered Shale, Mudstone, and Sandstone (Geologic Symbol: Qws). This formation is primarily composed of silty sand to silty clay soil with varying amounts of weathered shale, mudstone, or sandstone fragments. This formation is generally up to 10 feet thick in areas containing shale or mudstone and up to 30 feet thick in areas containing sandstone.

Based on the Bedrock Geologic Map of New Jersey, the site is underlain by the Stockton Formation (Geologic Symbol: Trs). The Stockton formation is primarily composed of a light gray to reddish brown, arkosic sandstone with lesser amounts of mudstone, siltstone, and shale.

The soil and rock samples observed during the geotechnical investigation were considered to be representative of those described in the publicly available geology.

4. LABORATORY TESTING

Soil samples obtained during the test boring operation were reviewed and visually classified. To further define the physical characteristics of the encountered soils, two representative soil samples were subjected to laboratory analysis. The analyses conducted on these samples consisted of the following:

- Natural Moisture Content Testing (ASTM D2216)
- Sieve Analysis (ASTM D6913)
- Atterberg Limits Determination (ASTM D4318)

The results of this testing are presented below.

Laboratory Test Results

Location	Depth (ft)	Layer ID	% Gravel	% Sand	% Fines	LL	PL	PI	Natural Moisture Content	USCS Group Symbol	ASTM Group Name
B-1	6 to 8	Stratum II	54.5	24.0	21.5	NP	NP	NP	21.3	GM	Silty GRAVEL with Sand
B-5	2 to 4	Stratum I	4.8	42.0	53.2	43	29	14	31.5	ML	Sandy SILT

LL = Liquid Limit, PL = Plastic Limit, PI = Plasticity Index, NP = Non-Plastic

5. SUBSURFACE INVESTIGATION

To evaluate the subsurface conditions at the project site, a total of six test borings, referenced as B-1 through B-6, were completed within the project footprint. The exploration locations are shown on the *Test Boring Location Plan* presented in Attachment B. The borings from this investigation were located in the field by RPM personnel based on information provided by the client.

The test borings were conducted to depths ranging between approximately 5 feet to 13 feet below existing ground surface. The test borings were generally terminated upon achieving auger refusal on the underlying bedrock surface. Rock coring was performed at boring locations B-1 and B-4 approximately 5 foot rock core below the encountered auger refusal depth to recover representative rock core samples.

The borings were completed utilizing an All-Terrain Vehicle (ATV) mounted drill rig equipped with hollow stem augers and split spoon samplers. The split spoon samples were conducted in accordance with ASTM D1586, were recovered at appropriate intervals throughout the test borings, and Standard Penetration Test (SPT) values were recorded for each soil sample. SPT values are the number of blows required to drive a 2 inch (outer-diameter), split barrel sampler 24 inches using a 140-pound weight dropped 30 inches. The number of blows required to advance the sampler over the 12-inch interval from 6 inches to 18 inches is considered the "N" value.

Oversight of the test boring operation was provided by a representative of RPM.

Descriptions of the encountered subsurface conditions are provided in the following sections of this report. Additional details regarding the encountered soils, obtained soil samples, and other subsurface information obtained in the test boring program are located in the *Test Boring Logs*, presented as Attachment C.

5.1 TOPSOIL

Topsoil was encountered at the ground surface at each test boring location measuring approximately 12 inches in thickness. Topsoil depths may differ within the unexplored portions of the site.

5.2 STRATUM I

Stratum I was encountered below the Topsoil layer in all test boring locations except for test boring location B-4. Stratum I extended to depths ranging between approximately 1 foot to 4 feet below existing grade, where encountered. This stratum consisted primarily of a brown to orangish brown Silty Clay / Clayey Silt, with varying amounts of sand and gravel-sized rock fragments. The documented N values indicated this layer was primarily in a medium stiff to very dense state.

Laboratory testing conducted on a representative sample of Stratum I indicated this soil was poorly graded and moderately plastic, with a natural moisture content of 31.5 percent and a Plasticity Index of 14. This soil was classified using the Unified Soil Classification System (USCS) as a Sandy SILT (ML).

5.3 STRATUM II (HIGHLY WEATHERED BEDROCK)

Stratum II was encountered immediately below the Topsoil in test boring B-4 and below Stratum I in all other test boring locations. Stratum II extended to depths ranging between approximately 4 feet to 8 feet below existing grade. This stratum consisted primarily of a brown to orangish brown Silty Clay, with varying amounts of sand and gravel-sized rock fragments. The weathered bedrock fragments were generally more than 3 inches in at least one dimension and increased in frequency with depth. The documented N values indicated this layer was primarily in a medium stiff to very hard state.

Laboratory testing conducted on a representative sample of Stratum II indicated this soil was well graded and non-plastic, with a natural moisture content of 9.8 percent. This soil was classified using the Unified Soil Classification System (USCS) as a Silty SAND (SM).

5.4 BEDROCK

Bedrock was encountered within all of the test borings completed during our investigation and was located at depths ranging between approximately 4 feet to 8 feet below existing ground surface. These depths correspond to site elevations ranging between approximately EL 161.5 feet to 169 feet. Bedrock was defined as the depth at which auger refusal was encountered. Depths below existing ground surface and the approximate elevations at which bedrock was encountered are shown below:

Approximate Bedrock Depths / Elevation		
Location	**Depth (feet)**	**Elevation (feet)**
B-1	8	161.5
B-2	8	163
B-3	5.4	167.1
B-4	4	169
B-5	8.2	167
B-6	7	166

Bedrock coring was conducted at test boring locations B-1 and B-4. Details regarding the coring runs are provided in the Table below.

Rock Core Info			
Location	**Core Depth / Elevation (feet)**	**Recovery (%)**	**RQD (%)**
B-1	8 to 13 / 161.5 to 156.5	85	20
B-4	4 to 9 / 169 to 164	85	0

RQD – Rock Quality Designation

Based on the above information and published information regarding this bedrock formation, it is our opinion that the upper portions of the bedrock underlying the site are highly weathered and highly fractured.

5.5 GROUNDWATER

Groundwater was not encountered in any of the test borings completed during this investigation. These observations were made at the time of the test boring operation; groundwater table elevations should be expected to vary with daily, seasonal, and climatological conditions.

6. GEOTECHNICAL CONCLUSIONS & RECOMMENDATIONS

The geotechnical investigation has revealed the general subsurface profile underlying the proposed construction site was comprised of the naturally-occurring soils of Stratum I, Stratum II (Highly Weathered Bedrock), and Bedrock.

Provided the recommendations detailed in this report are followed, the firm and stable naturally occurring soils, or structural fill (placed as described in this report), are suitable for support of the proposed assisted living facility and relocated historic residence on conventional shallow foundations.

Details regarding our geotechnical conclusions and recommendations are provided in the following sections.

6.1 FOUNDATIONS

The following foundation recommendations are provided for this project:

- Shallow strip and/or spread foundations are suitable for support of the proposed building and the relocated building.

- The foundation excavations shall fully penetrate the soils of Stratum I and be supported on the firm and stable soils of Stratum II, or structural fill placed in accordance with the recommendations in this report, or as directed below.

    - In no case should the foundations rest directly on the underlying bedrock. Should the bedrock be encountered within the foundation subgrade, it should be removed to a minimum depth of at least 6 inches below the planned foundation subgrade elevation. The resulting undercut can be backfilled back to the planned foundation subgrade elevation using clean ¾ inch stone, or structural fill placed as directed in this report.

- The foundations of the proposed and relocated building shall be designed for a **maximum allowable bearing pressure of 4,000 pounds per square foot (psf)**, based on column and wall foundations being a minimum of 3 feet and 1.5 feet in width, respectively.

- Exterior foundations shall rest on soils no less than 3 feet below final exterior grade to protect against frost heave. Interior foundations located in permanently heated portions of the structure may be established at conventional depths below the floor slab, provided that they are established within the intended bearing stratum.

- In addition, we recommend that the shallow foundations bear below a zone bounded by a plane that extends outward and upward on a 1:1 slope from any proposed or existing underground utility excavation or other underground features.

- Foundation subgrades shall be cleared of loose material or debris immediately prior to the placement of concrete.

- We recommend that no footings be excavated that cannot be poured on the same day.

The foundation subgrades shall be reviewed by a Geotechnical Engineer licensed in the State of New Jersey during construction to confirm the suitability of the subgrade soils.

6.2 SETTLEMENT

For the purposes of our settlement analyses, maximum column loads of 200 kips and wall loads of 5 kips per linear foot were considered. Based on these loads, recommended bearing pressures, and our geotechnical analyses, maximum post-construction settlement was expected to be less than 1 inch with differential settlements less than approximately 0.5 inches.

Should the foundation loads exceed those described above, RPM shall be contacted so we may review our analyses and revise our conclusions, if required.

6.3 LATERAL EARTH PRESSURES

The following data was provided for the design of any loading dock walls or proposed retaining walls which may be constructed at the site and was based on the use of on-site soils placed under engineering control for backfill.

Stratum I
Soil Unit Weight γ = 110 pcf
Cohesion C = 0 psf
Angle of Internal Friction ∅= 28 degrees
Coefficient of Active Pressure K_a = 0.35
Coefficient of Passive Pressure K_p = 2.88
Coefficient of At-Rest Pressure K_o = 0.52

Stratum II (Highly Weathered Bedrock)
Soil Unit Weight γ = 120 pcf
Cohesion C = 0 psf
Angle of Internal Friction ∅= 33 degrees
Coefficient of Active Pressure K_a = 0.29
Coefficient of Passive Pressure K_p = 3.39
Coefficient of At-Rest Pressure K_o = 0.46

Should different soil be used, design data shall be re-evaluated and revised, if necessary, based on the specific material.

Cantilevered retaining walls that are free to rotate should be designed for the active earth pressure condition. Walls that are braced, tied back, or otherwise restricted from rotation should be designed for the at-rest earth pressure condition. Passive earth pressure is used to estimate the resisting force when a wall structure is being forced against the soil material.

Surcharge loading caused by additional surface loads on the backfill soil (such as the loads placed on the floor slab-on-grade) should be added to the lateral pressure on the wall as a uniform stress equal to one-half the surcharge load. The earth pressure values assume no hydrostatic pressure from

groundwater and/or surface infiltration will be applied to the walls. We assume that such a water source for such hydrostatic pressure would not be available from the inside of the building.

6.4 FLOOR SLAB

The floor slabs for the proposed buildings may be constructed as conventional slabs on ground and supported on the firm and stable soils of Stratum I, Stratum II, or structural fill placed in accordance with the recommendations set forth in this report. Provided the soils supporting the slab were compacted to at least 95 percent of their maximum dry density and within ±2 percent of the optimum moisture content, both as determined by ASTM D1557, the soils were expected to exhibit a modulus of subgrade reaction of approximately 150 pounds per cubic inch (pci).

The slab shall be supported on a layer of free-draining crushed stone or washed gravel subbase, a minimum of 4 inches in thickness, and compacted to non-movement prior to placement of the slab concrete. The porous subslab layer provides a capillary break between the slab and the underlying subgrade soils.

In no case shall the floor slab be supported directly on the underlying bedrock surface. Should the bedrock surface be encountered at the slab subgrade elevation, it shall be excavated to a depth of at least 6 inches below the planned subgrade elevation. The resulting undercut should be backfilled back to the planned subgrade elevation using clean, ¾ inch stone.

Reinforced concrete floor slabs should be simply supported at wall and column junctures to allow unrestricted rotation of the slab edges. Alternatively, the slabs should be free to undergo vertical deflections at the edges. The slab shall be jointed around columns. Joints containing smooth dowels or keys may be used to prevent sharp vertical displacement or cracking.

6.5 SEISMIC SITE CLASSIFICATION

The subsurface soils can be classified as Seismic Site Class C, in accordance with "The 2018 International Building Code, New Jersey Edition".

7. CONSTRUCTION PHASE RECOMMENDATIONS

Based on our geotechnical engineering analyses for this project and our experience with similar projects, the following construction phase recommendations are offered in the following sections.

7.1 SITE PREPARATION

All surficial topsoil, vegetation, or other surficial materials shall be removed from all structural areas at the beginning of the project. Structural areas are defined as areas covered by proposed structure or any asphalt or concrete paved areas, extending a minimum of five feet beyond the proposed structure or pavement lines. Unstable or deleterious materials shall be removed from within these areas as detailed in this report.

7.2 PROOFROLLING

Structural areas shall be compacted using a steel-drum vibratory roller having a minimum static weight of at least 20 tons. This shall be done following the removal of surficial materials and any excavation needed to reach proposed subgrade elevations and prior to the placement of any structural fill. A minimum of five overlapping passes of the compaction equipment shall be completed across all structural areas.

Following the compaction procedures described above, proofrolling of the structural areas shall be performed using a fully loaded tri-axle dump truck. Weak or yielding areas discovered during the compaction and proofrolling procedures described above shall be compacted in-place to non-movement or removed to firm and stable subbase soils and replaced with structural fill placed in accordance with this report.

The compaction and proofrolling procedures described above are necessary to verify the stability of the upper zones of the structural areas and for uniform distribution of loads. In areas where removal of soils (cut) is required, proofrolling can be postponed until after the proposed subgrade elevation is achieved.

7.3 EXCAVATION CONSIDERATIONS

Construction excavations for this project are expected to take place within the soils of Stratum I, Stratum II, and likely the underlying weathered bedrock. The soils of Stratum I may be excavated using conventional excavation equipment. Portions of Stratum II were in a very dense state and contained large amounts of gravel and weathered rock fragments. Therefore, equipment capable of removing these very dense, gravelly soils should be utilized.

The possibility exists competent bedrock will be encountered during excavation at this site, particularly prior to reaching the basement concrete slab subgrade elevation. As previously referenced, the bedrock is anticipated to be highly fractured and weathered. However, excavation of the bedrock is anticipated to be very difficult. Equipment capable of removing very dense, highly fractured rock should be utilized during excavation. The use of pneumatic equipment may also be necessary during excavation. As such, there is potential for damage to existing structures from the vibrations caused by the use of pneumatic equipment. Therefore, considerations should be made for vibration monitoring in the event pneumatic equipment is required.

The use of explosives during excavation of the bedrock is not anticipated to be required.

All excavations shall be adequately sloped, benched, or otherwise supported to minimize collapse and protect personnel. In addition, all excavations shall be completed in accordance with all pertinent Occupational Safety and Health Administration (OSHA) guidelines and requirements.

7.4 STRUCTURAL FILL

Recommendations regarding imported structural fill and the use of on-site soils as structural fill are provided in the following sections.

Imported Fill

Any imported structural fill needed to raise site grades or replace weak and yielding soils shall be free of ash, trash, cinders, organic matter, or any other deleterious materials. The structural fill shall have a Plasticity Index (PI) less than 10, a Liquid Limit (LL) less than 30 and less than 15 percent by weight rock fragments larger than 3 inches with no particle size exceeding 6 inches. It shall also be well-graded with less than 30 percent by weight larger than the 3/4 inches and less than 30 percent smaller than the No. 200 sieve.

The Geotechnical Engineer of Record shall evaluate any imported soils proposed for use as structural fill that differ from above, prior to their placement at the site.

On-Site Soils Reuse

Comments regarding the suitability of the on-site soils for reuse as structural fill are provided below.

Stratum I – These soils consisted primarily of brown to orangish brown Silty Clay, with varying amounts of sand and gravel-sized rock fragments. These soils are generally suitable for use as structural fill, provided they are placed in accordance with the recommendations set forth in this report. Due to the fine-grained nature of portions of this stratum, this soil is moisture sensitive and difficulties properly placing it as structural fill should be expected.

Stratum II – These soils consisted primarily of orangish brown to brown Silty Clay, with varying amounts of sand and gravel-sized rock fragments. These soils are generally suitable for use as structural fill, provided they are placed in accordance with the recommendations set forth in this report, and any rock fragments larger than approximately 6 inches are removed. Due to the fine-grained nature of portions of this stratum, this soil is moisture sensitive and difficulties properly placing it as structural fill should be expected.

Our analysis of the suitability of the on-site soil for use as structural fill was based on data collected from the test boring location completed at the site. Soil suitability shall be confirmed in the field by a qualified Geotechnical Engineer during construction.

7.5 BACKFILLING REQUIREMENTS

The following structural fill lift thicknesses can be used with the following compaction equipment:

- Loose lifts not exceeding 10 inches: Where Heavy Compaction Equipment can be utilized.
- Loose lifts not exceeding 6 inches: Where only hand operated tampers or walk-behind roller can be utilized.

Within structural areas, all structural fill shall be compacted to at least 95 percent of the maximum dry density and within ±2 percent of the optimum moisture content, both as determined by ASTM D1557.

Within non-structural areas, all structural fill shall be compacted to at least 90 percent of the maximum dry density, and within ±2 percent of the optimum moisture content, both as determined by ASTM D1557.

The lift thicknesses, number of passes, and the type of the compaction equipment needed to achieve the compaction percentages noted above can be adjusted in the field during backfilling and compaction procedures. Further, we recommend only hand-tampers and walk-behind rollers be utilized during compaction behind any retaining walls or adjacent to any existing foundations, unless the Structural Engineer of Record for the project has reviewed the situation and has stated that heavy compaction equipment can be utilized in these areas.

7.6 FOUNDATION CONSTRUCTION

The following shall be adhered to during foundation construction at the site:

- Foundation subgrades shall be compacted using a walk-behind roller, hand-operated tamper, or similar excavation-appropriate compaction equipment to provide a firm and stable subbase suitable for proper support of the proposed foundations.

- Should the foundation subgrade soils be disturbed, they shall be compacted in place or removed to firm and stable subbase soils. The resulting over-excavation can be backfilled with concrete, flowable cementitious fill or structural fill placed in accordance with this report.

- Water shall be prevented from entering the foundation excavations. Any water that does enter the foundation excavation shall be removed as soon as practicable and the subgrade soils re-evaluated for stability.

- It is strongly recommended foundation excavation and concrete placement take place on the same day.

- Attention is directed to Section 6.1 of this Report. All recommendations therein shall be adhered to.

The foundation subgrades shall be reviewed by a Geotechnical Engineer licensed in the State of New Jersey during construction to confirm the suitability of the subgrade soils.

7.7 SLAB CONSTRUCTION

Prior to the placement of any granular subbase and placement of the concrete slab on ground, proofrolling and compaction of the proposed concrete slab area shall be carried out in accordance with this report.

Dependent upon the weather conditions, and construction schedules, the slab subgrade may contain weak, yielding and/or overly saturated soil immediately prior to slab construction. These soils may be removed and replaced in accordance with this report, or alternate methods, such as aerating and re-compacting, may be utilized to stabilize the slab subgrade. The most appropriate method used for stabilization of the slab subgrade shall be determined in the field based on site-specific field and soil conditions, as well as the availability and cost effectiveness of various methods. The Geotechnical Engineer shall be consulted should these needs arise.

In no case shall the floor slab be supported directly on the underlying bedrock surface. Should the bedrock surface be encountered at the floor slab subgrade elevation, it shall be excavated to

a depth of at least 6 inches below the planned subgrade elevation. The resulting undercut should be backfilled back to the planned subgrade elevation using clean, ¾ inch stone.

7.8 PAVEMENT CONSTRUCTION

Prior to any asphalt or concrete pavement, proposed pavement areas shall be thoroughly compacted and proofrolled in accordance with this report. These areas shall be compacted to a minimum 95 percent of the subgrade soil's maximum dry density and within ±2 percent of the optimum moisture content, both as determined by ASTM D1557. This process and the removal and replacement of any weak and yielding areas of the pavement subgrade shall be reviewed by the Geotechnical Engineer during construction.

The granular subbase portion of the proposed paving section shall be placed as soon as possible after the subgrade has been reviewed and approved by the Geotechnical Engineer. Exposure to construction traffic prior to paving, will likely result in degradation of the subbase materials and degradation of the stability of the subgrade soils.

Proper drainage is required for the successful performance of any pavement. It is assumed the pavement will be designed for proper grading to provide proper runoff.

Review of all pavement construction activities, including review of the gravel subbase layer and the pavement subgrades, shall be reviewed by a Geotechnical Engineer to ensure adherence to project plans, specifications and recommendation contained in this report.

Proofrolling of all pavement areas at the site shall take place in accordance with the recommendations set forth in this report.

7.9 DEWATERING

As previously referenced, groundwater was not encountered within the borings completed during this investigation. However, due to the encountered fine-grained soil and weathered rock, perched groundwater conditions may be encountered during excavation of the foundations and utility trenches. It is anticipated any encountered perched water will be able to be controlled using localized drainage ditches and submersible pumps.

These observations were made at the time of the test boring operation, and groundwater table elevations will vary with daily, seasonal, and climatological conditions.

8. CONSTRUCTION PHASE OBSERVATION & TESTING

As Geotechnical Engineer of Record for this project, it is recommended RPM be retained to provide the construction phase observations and materials testing during construction. This shall be done to verify the geotechnical recommendations detailed in this report are adhered to during construction at the site.

If an outside firm is retained to provide these services, RPM recommends this firm prepare a letter stating they will assume the responsibilities of Geotechnical Engineer of Record for the project. Further, we recommend this firm provide a letter stating their receipt of this report and acknowledgement of the recommendations provided therein, or detailing revisions to the recommendations within our report.

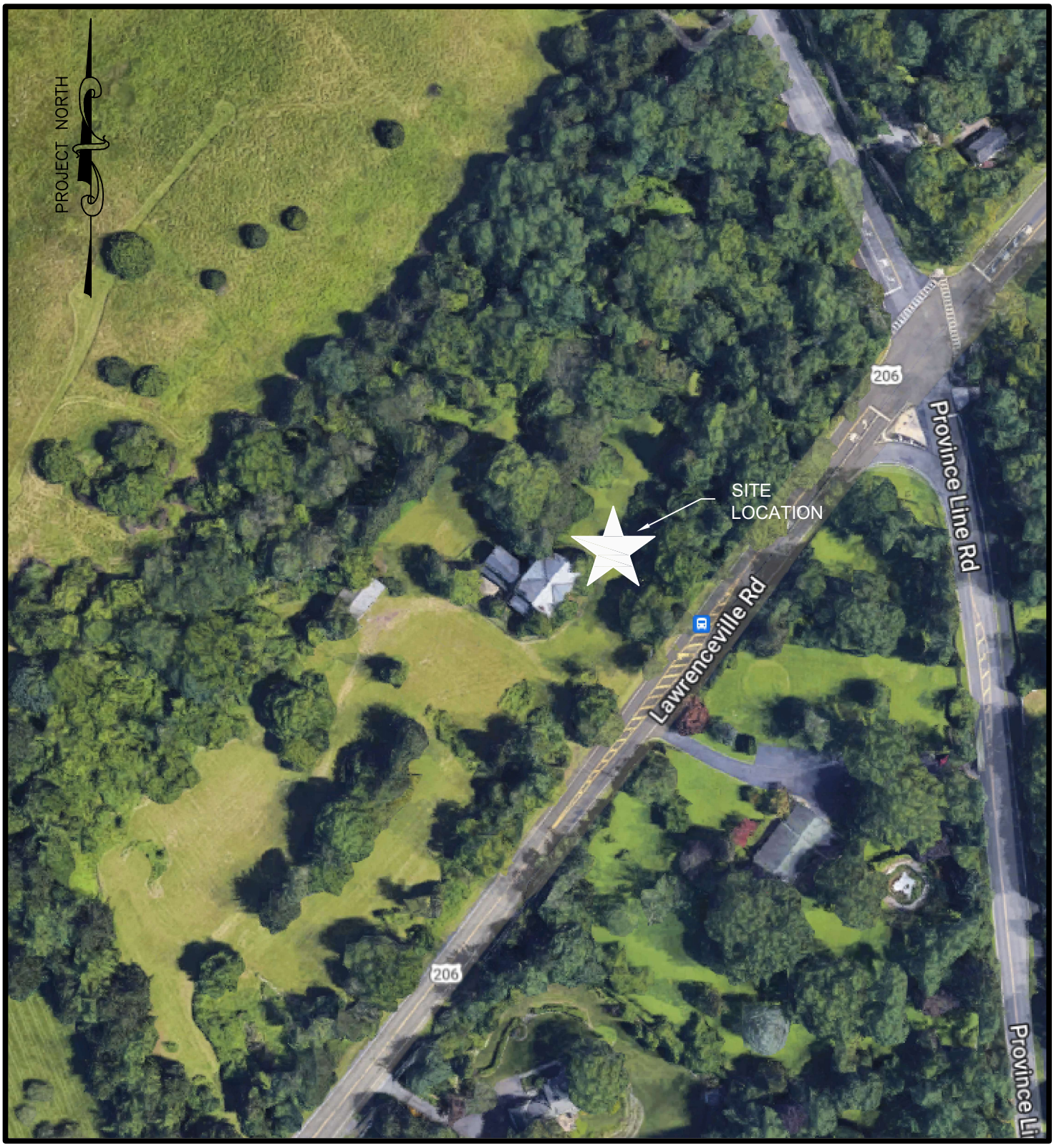
9. LIMITATIONS

This report has been prepared in accordance with generally accepted geotechnical practices for projects such as this one. The conclusions and recommendations contained in this report are based upon the subsurface data obtained from the test borings performed at the site for the proposed and relocated buildings. Soil conditions may vary from location to location and from point to point on the project site.

The validity of the conclusions and recommendations contained in this report are necessarily limited by the scope of the field investigation and by the number of test borings. It is understood the number of test locations made are consistent with good engineering practice but, given the nature of subsurface conditions, there is a possibility that actual conditions encountered may differ significantly from those projected in this report. Should conditions be encountered which differ from those described in this report, RPM shall be notified immediately so that our conclusions and recommendations can be reviewed and revised, if necessary.

The scope of this investigation was limited to the geotechnical analysis of the load-carrying capabilities and stability of the soils underlying the project area. Oil, hazardous 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.

Attachment A
Key Map Plan



PROJECT:	DRAWING TITLE	DRAWING SHEET
GEOTECHNICAL INVESTIGATION CAREONE ASSISTED LIVING FACILITY 3641 LAWRENCEVILLE-PRINCETON ROAD LAWRENCE TOWNSHIP, MERCER COUNTY, NEW JERSEY	KEY MAP PLAN	ATTACHMENT 'A'

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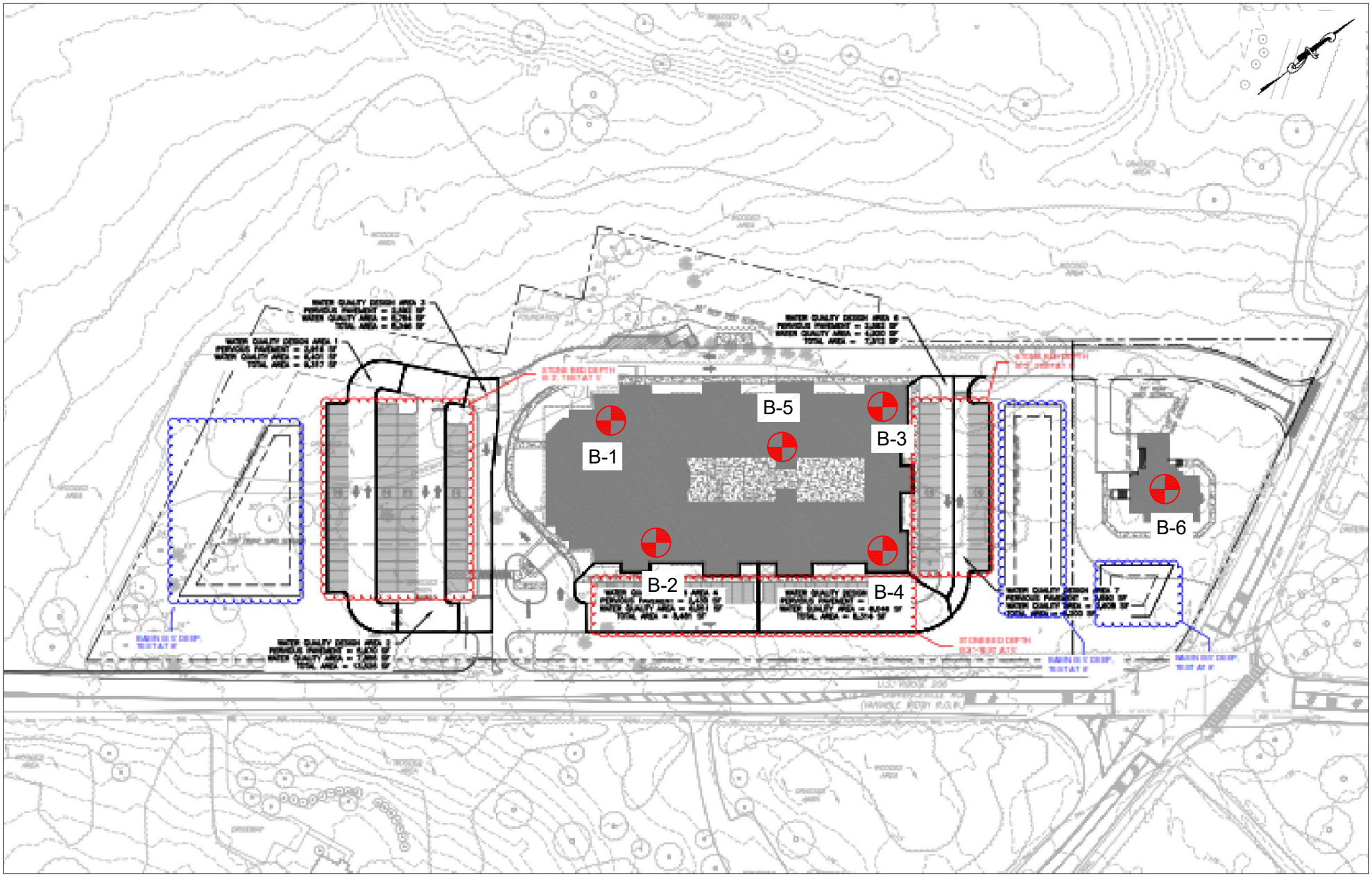
Attachment B
Test Boring Location Plan



PROJECT:	DRAWING TITLE	DRAWING SHEET
GEOTECHNICAL INVESTIGATION CAREONE ASSISTED LIVING FACILITY 3641 LAWRENCEVILLE-PRINCETON ROAD LAWRENCE TOWNSHIP, MERCER COUNTY, NEW JERSEY	TEST BORING LOCATION PLAN	ATTACHMENT 'B'

APPROXIMATE TEST BORING LOCATION

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Attachment C
Test Boring Logs

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TEST BORING LOG

Project:	Care One Lawrenceville Geotech	**Boring Number:**	B-1
Date Drilled:	5/6/22	**GS Elevation (ft):**	169.5
Driller/RPM Rep:	East Coast Drilling Inc. / AMD	**GW Depth (ft):**	NE
Rig Type:	Geoprobe 7822DT	**Drilling Method:**	3.25" ID HSA
Project Number:	61-150	**Topo Est:**	**Field Survey**

Depth (ft)	Sample #	Sample Depth	Blows/6"				N	Soil Description	Remarks
1	S-1	0' - 2'	20	40	6	5	**46**	Dense brown fine SAND and coarse GRAVEL	**Topsoil**
2								Stiff orange brown SILTY CLAY, some fine Gravel, trace weathered bedrock fragments	**Stratum I**
3	S-2	2' - 4'	4	4	8	10	**12**		
4									
5	S-3	4' - 6'	12	12	20	25	**32**	Very stiff orange brown SILTY CLAY, some weathered bedrock fragments	**Stratum II**
6									
7	S-4	6' - 8'	28	20	50/3"		**70**	Hard orange brown WEATHERED MUDSTONE FRAGMENTS, some fine to coarse Sand, some Clayey Silt	
8								***Spoon Refusal at 7.3'***	
9	S-5	8' - 13'	Rock Core C-1					***Auger Refusal at 8'*** C-1 (8' - 13') Highly Weathered Mudstone **Percent Recovery: 85% / RQD: 20%**	**Weathered Bedrock**
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									
25									
	END OF BORING AT 13 FEET								

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TEST BORING LOG

Project:	Care One Lawrenceville Geotech	**Boring Number:**	B-2
Date Drilled:	5/6/22	**GS Elevation (ft):**	171
Driller/RPM Rep:	East Coast Drilling Inc. / AMD	**GW Depth (ft):**	NE
Rig Type:	Geoprobe 7822DT	**Drilling Method:**	3.25" ID HSA
Project Number:	61-150	**Topo Est:**	**Field Survey**

Depth (ft)	Sample #	Sample Depth	Blows/6"				N	Soil Description	Remarks
1	S-1	0' - 2'	1	1	1	1	**2**	Brown SILTY CLAY, little fine Sand, trace coarse Gravel	**Topsoil**
2									
3	S-2	2' - 4'	7	13	15	17	**28**	Brown very stiff SILTY CLAY, little fine Sand, little weathered mudstone fragments	**Stratum I**
4									
5	S-3	4' - 6'	15	25	43	20	**68**	Hard brown SILTY CLAY, little fine Sand, some weathered mudstone fragments	
6									**Stratum II**
7	S-4	6' - 8'	23	48	50	50 /5"	**98**	Hard brown SILTY CLAY, trace little Sand, some weathered mudstone fragments	
8									
9								***Auger Refusal at 8'***	
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									
25									
	END OF BORING AT 8 FEET (AUGER REFUSAL)								

RPM ENGINEERING
With Integrity

TEST BORING LOG

Project:	Care One Lawrenceville Geotech	**Boring Number:**	B-3
Date Drilled:	5/6/22	**GS Elevation (ft):**	172.5
Driller/RPM Rep:	East Coast Drilling Inc. / AMD	**GW Depth (ft):**	NE
Rig Type:	Geoprobe 7822DT	**Drilling Method:**	3.25" ID HSA
Project Number:	61-150	**Topo Est:**	**Field Survey**

Depth (ft)	Sample #	Sample Depth	Blows/6"				N	Soil Description	Remarks
1	S-1	0' - 2'	1	1	1	1	**2**	Very soft brown SILTY CLAY, little fine Sand	**Topsoil**
2								Very stiff brown SILTY CLAY, some fine Sand, some weathered mudstone fragments	**Stratum I**
3	S-2	2' - 4'	7	8	11	7	**19**		
4									
5	S-3	4' - 6'	7	30	50/5"		**50**	Hard brown SILTY CLAY, some fine Sand, some weathered mudstone fragments	**Stratum II**
6									
7								***Auger and Spoon Refusal at 5.4'***	
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									
25									
	END OF BORING AT 5.4 FEET (AUGER REFUSAL)								

RPM ENGINEERING
With Integrity

TEST BORING LOG

Project:	Care One Lawrenceville Geotech	**Boring Number:**	B-4
Date Drilled:	5/6/22	**GS Elevation (ft):**	173
Driller/RPM Rep:	East Coast Drilling Inc. / AMD	**GW Depth (ft):**	NE
Rig Type:	Geoprobe 7822DT	**Drilling Method:**	3.25" ID HSA
Project Number:	61-150	**Topo Est:**	**Field Survey**

Depth (ft)	Sample #	Sample Depth	Blows/6"				N	Soil Description	Remarks
1	S-1	0' - 2'	2	2	7	8	**9**	Stiff brown SILTY CLAY, little fine Sand, some Weathered Mudstone	**Topsoil**
2								Hard brown SILTY CLAY and WEATHERED MUDSTONE FRAGMENTS, little fine Sand	**Stratum II**
3	S-2	2' - 4'	17	34	65	50	**99**		
4									
5	S-3	4' - 9'	Rock Core C-2					***Auger and Spoon Refusal at 4'*** C-2 (4' - 9') Highly Weathered Mudstone **Percent Recovery: 85% / RQD: 0%**	**Weathered Bedrock**
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									
25									
	END OF BORING AT 9 FEET								

RPM ENGINEERING
With Integrity

TEST BORING LOG

Project:	Care One Lawrenceville Geotech	**Boring Number:**	B-5
Date Drilled:	5/6/22	**GS Elevation (ft):**	171
Driller/RPM Rep:	East Coast Drilling Inc. / AMD	**GW Depth (ft):**	NE
Rig Type:	Geoprobe 7822DT	**Drilling Method:**	3.25" ID HSA
Project Number:	61-150	**Topo Est:**	**Field Survey**

Depth (ft)	Sample #	Sample Depth	Blows/6"				N	Soil Description	Remarks
1	S-1	0' - 2'	1	1	1	2	**2**	Very soft brown SILTY CLAY, trace fine Sand	**Topsoil**
2								Medium stiff brown CLAYEY SILT and fine to coarse SAND, trace Weathered Bedrock fragments	**Stratum I**
3	S-2	2' - 4'	**2**	**3**	**5**	**5**	**8**		
4									
5	S-3	4' - 6'	7	10	12	15	**22**	Very stiff brown SILTY CLAY, little fine Sand, some Weathered Bedrock fragments	**Stratum II**
6									
7	S-4	6' - 8'	7	7	9	13	**16**	Medium stiff brown SILTY CLAY, little fine Sand, some Weathered Bedrock fragments	
8									
9	S-5	8' - 10'	50/2"				**50**	Hard brown SILTY CLAY, little fine Sand, some Weathered Bedrock fragments	
10								***Auger and Spoon Refusal at 8.2'***	
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									
25									
	END OF BORING AT 8.2 FEET (AUGER REFUSAL)								

RPM ENGINEERING
With Integrity

TEST BORING LOG

Project:	Care One Lawrenceville Geotech	**Boring Number:**	B-6
Date Drilled:	5/6/22	**GS Elevation (ft):**	173
Driller/RPM Rep:	East Coast Drilling Inc. / AMD	**GW Depth (ft):**	NE
Rig Type:	Geoprobe 7822DT	**Drilling Method:**	3.25" ID HSA
Project Number:	61-150	**Topo Est:**	**Field Survey**

Depth (ft)	Sample #	Sample Depth	Blows/6"				N	Soil Description	Remarks
1	S-1	0' - 2'	4	4	4	4	**8**	Medium stiff brown SILTY CLAY, little fine Sand, trace Weathered Mudstone Fragments	**Topsoil**
2									
3	S-2	2' - 4'	4	4	4	4	**8**	Medium stiff brown SITLY CLAY and WEATHERED MUDSTONE, little fine Sand	**Stratum I**
4									
5	S-3	4' - 6'	14	12	12	30	**24**	Very stiff brown SILTY CLAY and WEATHERED MUDSTONE, little fine Sand	
6									**Stratum II**
7	S-4	6' - 8'	30	50/3"			**50**	Hard brown SILTY CLAY and WEATHERED MUDSTONE, little fine Sand	
8								***Spoon Refusal at 6.8'***	
9								***Auger Refusal at 7'***	
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									
25									
	END OF BORING AT 7 FEET (AUGER REFUSAL)								

Attachment D
Lab Test Results

RPM ENGINEERING
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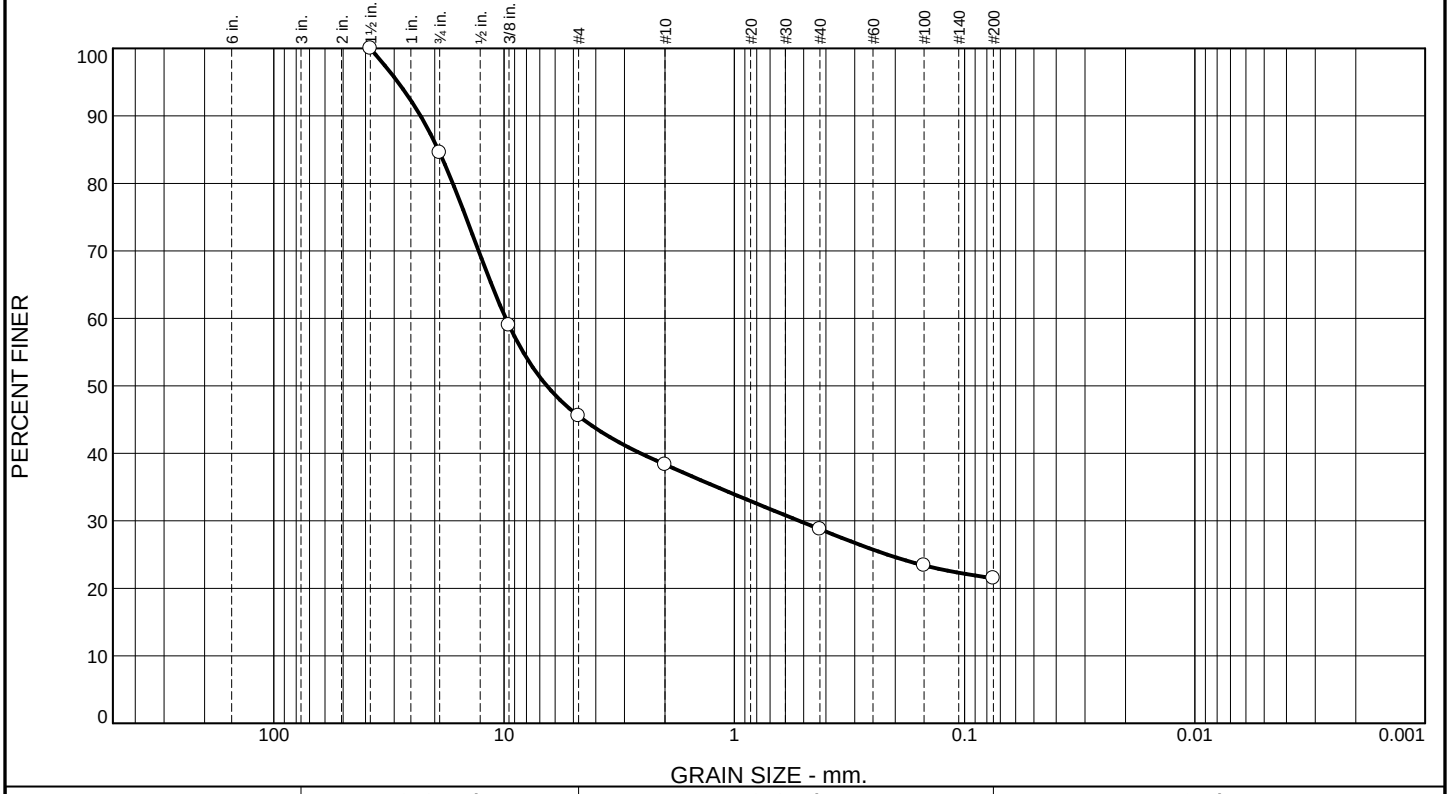
Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	15.4	39.1	7.2	9.5	7.3	21.5	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1-1/2	100.0		
3/4	84.6		
3/8	59.0		
#4	45.5		
#10	38.3		
#40	28.8		
#100	23.4		
#200	21.5		

* (no specification provided)

Material Description

Weathered Bedrock Fragments, some fine to coarse Sand, some Clayey Silt

GM- silty gravel with sand

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{90}= 23.0520 D_{85}= 19.3118 D_{60}= 9.8324
D_{50}= 6.5226 D_{30}= 0.5232 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= GM AASHTO= A-1-b

Remarks

As received moisture content 21.3%

Source of Sample: B-1 **Depth:** 6-8'
Sample Number: S-4

Date: 5/13/22

RPM Engineering LLC

West Deptford, NJ

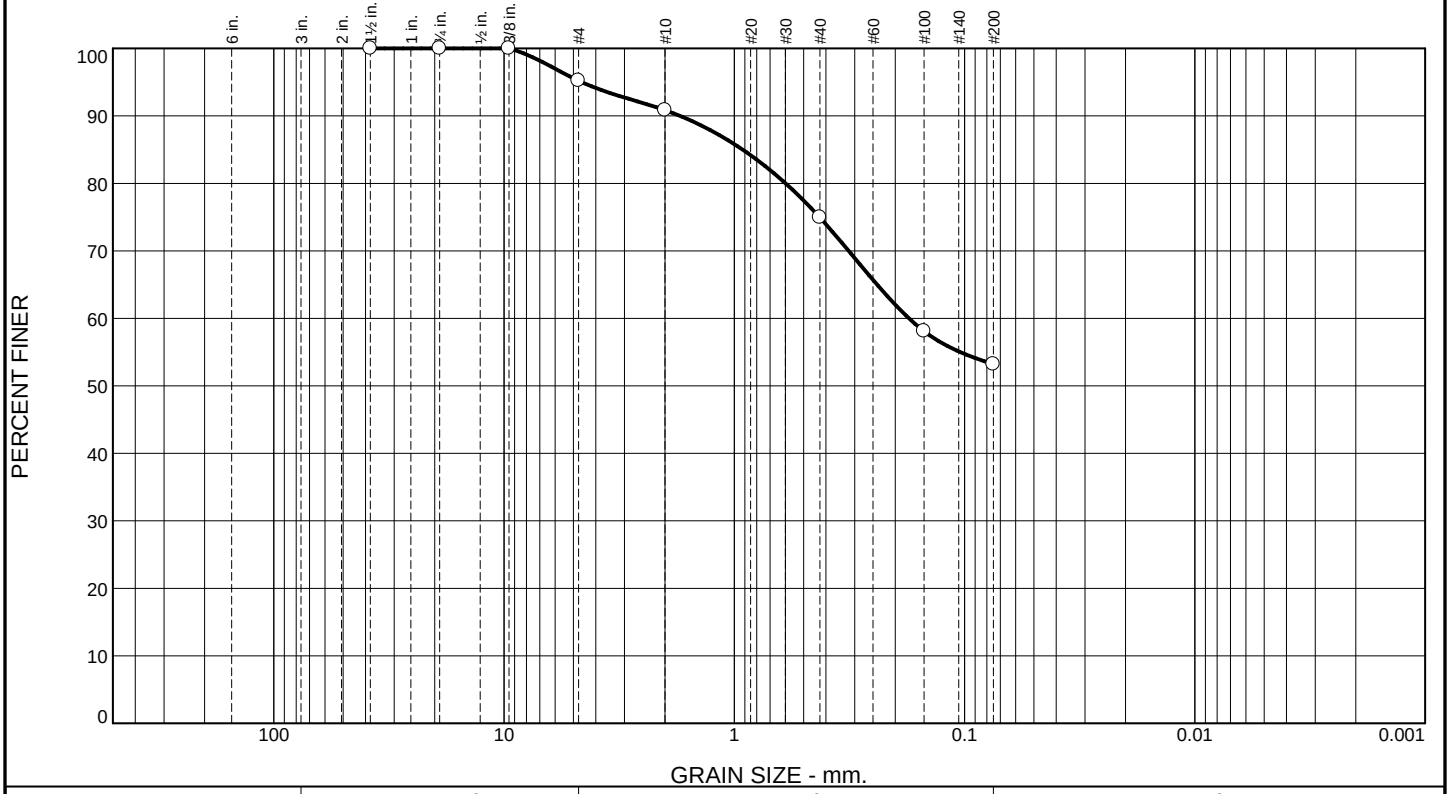
Client: T & M
Project: Care One Assissted Living Geotech & Stormwater

Project No: 61-150 **Figure** Attachment D

Tested By: M.K **Checked By:** F.D

RPM ENGINEERING
With Integrity

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	4.8	4.4	15.9	21.7	53.2	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1-1/2	100.0		
3/4	100.0		
3/8	100.0		
#4	95.2		
#10	90.8		
#40	74.9		
#100	58.1		
#200	53.2		

* (no specification provided)

Material Description

Brown CLAYEY SILT and fine to coarse SAND, trace Weathered Bedrock Fragments
ML - Sandy Silt

Atterberg Limits

PL= 29 LL= 43 PI= 14

Coefficients

D_{90}= 1.7221 D_{85}= 0.9198 D_{60}= 0.1744
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= ML AASHTO= A-7-6(5)

Remarks

As received Moisture - 31.5%

Source of Sample: B-5 **Depth:** 2-4'
Sample Number: S-2 **Date:** 5/13/22

RPM Engineering LLC

West Deptford, NJ

Client: T & M
Project: Care One Assissted Living Geotech & Stormwater
Project No: 61-150 **Figure** Attachment D

Tested By: MK **Checked By:** FD