Geotechnical Engineering Report

Lakewood Elementary School
Myrtle Beach, South Carolina
November 24, 2020
Terracon Project No. ER205020

Prepared for:
Mead & Hunt
Myrtle Beach, South Carolina

Prepared by:
Terracon Consultants, Inc.
Myrtle Beach, SC

November 24, 2020

Mead & Hunt
333 Wellness Drive
Myrtle Beach, South Carolina 29579

Attn: Mr. Jeffrey Miller, PE
E: jeff.miller@meadhunt.com

Re: Geotechnical Engineering Report
Lakewood Elementary School
1675 Highway 396
Myrtle Beach, South Carolina
Terracon Project No. ER205020

Dear Mr. Miller:

We have completed the Geotechnical Engineering services for the above referenced project. This study was performed in general accordance with Terracon Proposal No. PER205020 dated October 16, 2020. This report presents the findings of the subsurface exploration and provides geotechnical recommendations concerning earthwork and pavement thickness for the proposed project.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning this report or if we may be of further service, please contact us.

Sincerely,
Terracon Consultants, Inc.

SOUTH CAROLINA REGISTERED PROFESSIONAL ENGINEER No. 20954 HICKS PARSONS
11/24/2020

Wendy H. Parsons, PE
Senior Engineer

SOUTH CAROLINA TERRACON CONSULTANTS, INC. No. 2220 CERTIFICATE OF AUTHORIZATION

Dylan Tanner
Field Engineer

Guoming Lin, Ph.D., P.E.
Senior Principal

REPORT TOPICS

Note: This report was originally delivered in a web-based format. For more interactive features, please view your project online at client.terracon.com.

ATTACHMENTS

Note: Refer to each individual Attachment for a listing of contents.

REPORT SUMMARY

Topic [1]	Overview Statement [2]
Project Description	Based on information provided by the client, we understand that proposed improvements will consist of approximately 2,000 lf of new pavement for a proposed parent loop, a 20 foot wide fire lane along the front of the school, planned mill and replacement of existing asphalt along the front of the school and the expansion of an existing pond. Final grades to match existing grades as much as possible (provided by client via email) Expected traffic for pavement areas: n 2,000 to 2,500 cars and light truck traffic per day (assumed) n 2 Delivery trucks per day (assumed)
Geotechnical Characterization	**Non-Paved Areas** Topsoil 6 to 12 inches Sands and sands with silt to termination of deepest sounding at 5 feet **Paved Areas** Asphalt to approximately 1 ¾ inches Marine Limestone Base Course to approximately 6 ½ inches Sand with silt and gravel and silty sand to termination of deepest sounding at 4 feet Groundwater encountered at depths ranging from 2 ½ to 4 ½ feet at time of boring
Earthwork	Proofroll and undercut as needed within pavement areas.
Pavements	According to the Site Plan provided by Mead & Hunt, we understand mill and overlay of the existing asphalt section is planned to take place. We have provided the following asphalt overlay thickness for paved areas: ■ Mill existing asphalt and overlay with 1.5 inches Asphaltic Concrete (AC) Surface Course Type C over 1.5 inches Asphaltic Concrete Intermediate Course Type C Asphalt (Non-Paved Areas, subgrade prepared as noted in **Earthwork**.): ■ 1.5 inches Asphaltic Concrete (AC) Surface Course Type C over 1.5 inches Asphaltic Concrete Intermediate Course Type C over 6 inches of Graded Aggregate Base Course (GABC) in Light Duty areas
General Comments	This section contains important information about the limitations of this geotechnical engineering report.

1. If the reader is reviewing this report as a pdf, the topics above can be used to access the appropriate section of the report by simply clicking on the topic itself.
2. This summary is for convenience only. It should be used in conjunction with the entire report for design purposes.

Geotechnical Engineering Report

Lakewood Elementary School
1675 Highway 396
Myrtle Beach, South Carolina

Terracon Project No. ER205020
November 24, 2020

INTRODUCTION

This report presents the results of our subsurface exploration and geotechnical engineering services performed for the proposed parent loop at Lakewood Elementary to be located at 1675 Highway 396 in Myrtle Beach, South Carolina. The purpose of these services is to provide information and geotechnical engineering recommendations relative to:

- Subsurface soil conditions
- Groundwater conditions
- Site preparation and earthwork
- Subgrade preparation
- Pavement thickness recommendations
- Other geotechnical design parameters

Six Hand Auger Borings (HABs) with Dynamic Cone Penetrometer (DCP) testing were performed to depths of approximately 3 to 5 feet below the existing ground surface. Two of the six HABs (HAB-01 and HAB-03) were advanced in the existing pavement section along the front of the school. HAB-01, HAB-02, HAB-03 and HAB-04 were terminated short of the planned depth of 5 feet due to hole collapse at the time of boring. Additionally, one HAB (HAB-07) was advanced within the proposed pond location.

Maps showing the site and boring locations are shown in the **Site Location** and **Exploration Plan** sections, respectively. The results of the laboratory testing performed on soil samples obtained from the site during the field exploration are included on the boring logs in the **Exploration Results** section.

SITE CONDITIONS

The following description of site conditions is derived from our site visit in association with the field exploration and our review of publicly available geologic and topographic maps.

Item	Description
Parcel Information	The project is located at 1675 Highway 396 in Myrtle Beach, South Carolina. Latitude: 33.64876° Longitude: -78.95346° (See Exhibit D) See **Site Location**

Item	Description
Existing Improvements	Based on our recent site visit, the northwest side of the site is developed with an existing building and parking areas. The southeast portion of the site is undeveloped.
Current Ground Cover	Based on our recent site visit, the northwest side of the site is cleared and contains a building and parking and drive areas consisting of asphalt pavement. The southeast side of the site is predominantly wooded. An existing pond is located within the southeast portion of the site as well.
Existing Topography	Topographic information was not available at the time this report was prepared. Based on our recent site visit, the site appears relatively flat within the roadway alignment.

PROJECT DESCRIPTION

Our initial understanding of the project was provided in our proposal and was discussed during project planning. A period of collaboration has transpired since the project was initiated, and our final understanding of the project conditions is as follows:

Item	Description
Proposed Improvements	Based on information provided by the client, we understand that proposed improvements will consist of approximately 2,000 lf of new pavement for a proposed parent loop, a 20 foot wide fire lane along the front of the school, planned mill and replacement of existing asphalt along the front of the school and the expansion of an existing pond.
Grading	A grading plan has not been provided during the course of our work. We have assumed the proposed roadway will match existing grades for the purpose of this report. If final grading plans differ from what has been assumed, a review must be made by Terracon to determine if modifications to our design will be required.
Pavements	We assume flexible (asphalt) pavement sections should be considered. Anticipated traffic is as follows: ■ 2,000 to 2,500 cars and light truck traffic per day (assumed) ■ 2 Delivery trucks per week (assumed) Pavement design period is 20 years.

GEOTECHNICAL CHARACTERIZATION

Subsurface Profile

Based on the results of the field exploration, subsurface conditions on the project site can be generalized as follows:

Non-Paved Areas

Description	Approximate Depth to Bottom of Stratum	Material Encountered[1]
Stratum 1	6 to 12 inches	Topsoil
Stratum 2	5 feet[2]	Loose to medium dense sand and sand with silt

1. Material descriptions are based on visual classification from HAB samples and correlations with in situ data.
2. Termination of deepest boring.

Existing Pavement Conditions

Based on the results of the field exploration, subsurface conditions on the project site for the paved areas evaluated can be generalized as follows:

Location	Average Asphalt Thickness (in)	Average Base Course Thickness (in)	Subgrade Description
Paved Areas	1 ¾	4 ¾	Sand with silt and gravel (SP-SM) and silty sand (SM)

In addition to the subsurface investigation, we performed a limited visual condition survey of the existing pavement. Our visual inspection of pavements indicated the existing pavements are in good to fair condition overall. Low severity edge cracking was observed adjacent to landscaped areas. Examples are depicted in the following pictures from the site:

Figure 1: Fair pavement conditions

Figure 2: Good to fair pavement conditions

Figure 3: Low severity edge cracking

Figure 4: Low severity edge cracking

Conditions encountered at each test location are indicated on the individual test records. Stratification boundaries on the test records represent the approximate location of changes in soil types. The transition between materials may be gradual. Details for each of the tests can be found in **Exploration Results**.

Groundwater Conditions

The following table lists approximate depths to groundwater encountered below existing grade at the time of our field exploration.

Location	Groundwater Depth (ft)
HAB--01	3
HAB-02	3
HAB -03	2 ½
HAB -04	2 ½
HAB -05	4 ½
HAB -06	N/E
HAB -07	4 ½

1. N/E – Not encountered up to boring termination

Groundwater level fluctuations occur due to seasonal variations in the amount of rainfall, runoff and other factors not evident at the time the borings were performed. Therefore, groundwater levels during construction or at other times in the life of the structure may be higher or lower than the levels indicated on the logs. The possibility of groundwater level fluctuations should be considered when developing the design and construction plans for the project. The groundwater surface should be checked prior to construction to assess its effect on site work and other construction activities.

EARTHWORK

Earthwork is anticipated to include clearing, stripping and grubbing. The following sections provide recommendations for use in the preparation of specifications for the work. Recommendations include critical quality criteria, as necessary, to render the site in the state considered in our geotechnical engineering evaluation for pavements.

Site Preparation

We recommend that a site drainage plan be established and implemented prior to large scale clearing/stripping activities. This can include directing runoff water to existing drainage features, excavation of temporary sumps, drainage ditches, and/or swales across the project site. These measures will allow for perched water to be directed away from construction areas limiting the softening of near surface soils.

With positive drainage established, the proposed limits of construction should be stripped of trees, organic material, topsoil, root balls, and other deleterious material from within the proposed roadway alignment. Stripping should extend a minimum of 5 feet outside the construction area footprint. We anticipate stripping depths to average 6 to 12 inches across the site. **Please bear in mind**, due to the uneven ground surface of the site, the volume of topsoil and organics may be significantly greater than the area times the topsoil/organics thickness indicated in the boring logs. Rutting of the subgrade can also cause mixing of topsoil/organics with underlying soils, which will result in additional required topsoil/organics stripping. Deeper undercutting may be needed in some localized areas to remove tree stumps or other unsuitable materials, especially in wetland areas. Voids remaining from the clearing/stripping operation should be backfilled with properly compacted Controlled Fill.

After stripping and subgrade repair is completed, the existing subgrade should be proofrolled with a loaded tandem axle dump truck or other similar approved construction equipment. A geotechnical engineer should monitor proofrolling operations. Areas that pump or rut excessively should be undercut and reworked or replaced with Controlled Fill. Excessively wet or dry material should either be removed or moisture conditioned and recompacted.

If near surface soils are exposed to rubber-tired traffic during wet periods, they may lose their strength leading to rutting and increased undercutting depths. The ability to maintain competent bearing soils will affect pavement design and overall performance. Placement of base course materials as soon as possible in pavement areas would provide protection for the subgrade as other construction takes place. Clearing techniques that minimize soil subgrade disturbance should be employed.

All subgrade and base course materials and placement procedures should adhere to the SCDOT Standard Specifications for Highway Construction, 2007 Edition.

On-site Borrow Suitability

One Hand Auger Boring (HAB-07) was performed within the proposed pond to a depth of 5 feet below existing grade. Subsurface conditions can be generalized as follows:

Description	Approximate Depth to Bottom of Stratum	Material Encountered[1]
Stratum 1	6 inches	Topsoil
Stratum 2	4 ½ feet	Sands (SP)
Stratum 3	5 feet	Sands with silt (SP-SM)

1. Material descriptions are based on laboratory results and visual classification from HAB samples.

Selected soil samples were tested in the laboratory in accordance with ASTM D1140 Standard Test Methods for Amount of Material in Soils Finer than No. 200 (75-µm) Sieve. Laboratory test results indicated a fines percentage of 4.4% for the material encountered within Stratum 2. SP and SP-SM type soils with fines content less than 15% would be considered suitable for use within pavement areas.

Should on-site soils be utilized as controlled fill material, several guidelines should be followed. Soils should be placed in thin lifts (approximately 6 to 8 inches), aerated and dried to ±3% of their optimum moisture content, and compacted to at least 95% of the Maximum Dry Density as determined by ASTM D1557 prior to placing the next lift. Soils should be rolled smooth and crowned to prevent water from ponding. Soils excavated from beneath the water table can be expected to be wet and at a moisture content significantly higher than optimum. Time for drying should be allowed for during the construction process for soils containing elevated moisture contents at the time of excavation. Drying time will be largely weather dependent and will increase with lift thickness.

Terracon has reported our findings at each test location advanced in efforts to determine the extent of suitable fill material at this site. However, we cannot make assumptions regarding soils outside of what is observed at our test locations.

Fill Material Types

Fill required to achieve design grade should be classified as structural fill and general fill. Structural fill is material used below, or within 10 feet of structures, pavements or constructed slopes. General fill is material used to achieve grade outside of these areas. Earthen materials used for structural and general fill should meet the following material property requirements:

Soil Type [1]	USCS Classification	Acceptable Parameters (for Structural Fill)
Controlled, Imported Fill	SP, SP-SM, SP-SW, SW, SM	Non-plastic Less than 12% passing No. 200 sieve
Onsite Soil	SP, SP-SM, SM	Non-plastic Less than 15% passing No. 200 sieve

1. Structural and general fill should consist of approved materials free of organic matter and debris. Frozen material should not be used, and fill should not be placed on a frozen subgrade. A sample of each material type should be submitted to the Geotechnical Engineer for evaluation prior to use on this site.

Fill Compaction Requirements

ITEM	DESCRIPTION
Fill Lift Thickness	When heavy, self-propelled compaction equipment is used, fill lifts shall have a maximum of 8 inches in loose thickness.
	When hand-guided equipment (i.e. jumping jack or plate compactor) is used, fill lifts shall have a maximum of 2 to 4 inches in loose thickness.
Compaction Requirements[1]	The pavement base course should be compacted to 100% of the material's maximum Modified Proctor dry density (ASTM D1557).
	The upper 12 inches of the pavement subgrade should be compacted to 95% of the material's maximum Modified Proctor dry density (ASTM D1557).
Moisture Content – Controlled Fill or Onsite Soils[2]	Within the range of ±2% of optimum moisture content value as determined by the Modified Proctor test.

1. Fill should be tested for moisture content and compaction during placement. If the results of the in-place density tests indicate the specified moisture or compaction limits have not been met, the area represented by the test should be reworked and retested as required until the specified moisture and compaction requirements are achieved.

2. Specifically, moisture levels should be maintained low enough to allow for satisfactory compaction to be achieved without the Controlled Fill material pumping when proofrolled.

PAVEMENT RECOMMENDATIONS

Existing Paved Areas

For existing paved areas, it appears the existing subgrade and base courses are adequate. It is our understanding milling and overlay is planned for rehabilitation of the existing pavement. We recommend milling the existing asphalt and replacing with 1 ½ inches of asphalt concrete intermediate course Type C followed by 1 ½ inches of asphalt concrete surface course Type C. The extent of milling required will be dependent on the final grading plan.

Disturbance to the existing base course material should be minimized as much as possible in order to maintain the existing thickness after milling operations. After milling operations take place, preparation of the base course should adhere to the SCDOT Standard Specifications for Highway Construction, 2007 Edition.

Construction traffic and additional wear and tear may deteriorate pavements further prior to time of paving. Construction traffic should be kept at a minimum on existing pavement. We recommend any milled surface not be exposed and subject to heavy or continual traffic for an extended period of time.

Subgrade Preparation – Unpaved Areas

Pavement subgrades should be carefully evaluated by Terracon personnel as the time for pavement construction approaches. The moisture content and density of the subgrade should be evaluated and the pavement subgrades proofrolled prior to commencement of actual paving operations. Areas not in compliance with the required ranges of moisture or density should be moisture conditioned and recompacted (or removed and replaced). Particular attention should be paid to high traffic areas that were rutted and disturbed during earlier construction activities and to areas where backfilled trenches are located.

If a significant precipitation event occurs after the evaluation or if the surface becomes disturbed, the subgrade should be reviewed by qualified personnel immediately prior to paving. The subgrade should be in its finished form at the time of the final review.

Estimates of Minimum Pavement Thickness

For new pavements, the minimum S_N required by the traffic loading and the subgrade soil strength is calculated from the subgrade strength data, assumed traffic volumes, assumed traffic growth rate, and design life. Based on the implementation of site preparation previously outlined in this report, we have assumed a CBR value of 8.

In our analysis, “light duty” pavements were estimated to be subjected to a traffic load on the order of 75,000 ESAL’s. “Light duty” pavement is used in parking/drive areas subjected solely to light passenger car and light truck traffic. Traffic patterns and anticipated loading conditions were not available at the time this report was prepared. Terracon should be contacted to review and revise these recommendations if traffic loading significantly differs from those assumed herein.

Paved Areas

Traffic Area	Rehabilitation Option	Existing Pavement Milling Depth (in)	A/C Surface Course Overlay (in) (SCDOT Type C)	A/C Intermediate Course Overlay (in) (SCDOT Type C)
Existing Pavement	Mill and A/C Overlay	Dependent on Final Grades	1.5	1.5

Non-Paved Areas

Proposed Roadway	Aggregate Base (SCDOT GABC)	A/C Surface (SCDOT Type C)	A/C Intermediate (SCDOT Type C)	Total Thickness
Light Duty	6	1.5	1.5	9

Subgrade, base and pavement construction operations and materials should meet the minimum requirements of the South Carolina Department of Transportation’s (SCDOT*) Standard Specifications for Highway Construction*, 2007 edition. The Aggregate Base Course should be compacted to 100% of its Modified Proctor as determined by AASHTO T-150. The Asphalt Concrete should be compacted to 92.2% to 95% of the theoretical specific gravity of the mix, as determined by ASTM D2041.

Pavement Drainage

Pavements should be sloped to provide rapid drainage of surface water. Water allowed to pond on or adjacent to the pavements could saturate the subgrade and contribute to premature pavement deterioration. In addition, the pavement subgrade should be graded to provide positive drainage within the granular base section. Appropriate sub-drainage or connection to a suitable daylight outlet should be provided to remove water from the granular subbase.

Openings in pavements, such as decorative landscaped areas, are sources for water infiltration into surrounding pavement systems. Water can collect in the islands and migrate into the surrounding subgrade soils thereby degrading support of the pavement. This is especially applicable for islands with raised concrete curbs, irrigated foliage, and low permeability near-surface soils. The civil design for the pavements with these conditions should include features to restrict or collect and discharge excess water from the islands. Examples of features are edge drains connected to the storm water collection system, longitudinal subdrains, or other suitable outlets and impermeable barriers preventing lateral migration of water such as a cutoff wall installed to a depth below the pavement structure.

Pavement Maintenance

The pavement sections represent minimum recommended thicknesses and, as such, periodic maintenance should be anticipated. Therefore, preventive maintenance should be planned and provided for through an on-going pavement management program. Maintenance activities are intended to slow the rate of pavement deterioration and to preserve the pavement investment. Maintenance consists of both localized maintenance (e.g., crack and joint sealing and patching) and global maintenance (e.g., surface sealing). Preventive maintenance is usually the priority when implementing a pavement maintenance program. Additional engineering observation is recommended to determine the type and extent of a cost-effective program. Even with periodic maintenance, some movements and related cracking may still occur and repairs may be required.

GENERAL COMMENTS

Our analysis and opinions are based upon our understanding of the project, the geotechnical conditions in the area, and the data obtained from our site exploration. Natural variations will occur between exploration point locations or due to the modifying effects of construction or weather. The nature and extent of such variations may not become evident until during or after construction. Terracon should be retained as the Geotechnical Engineer, where noted in this report, to provide observation and testing services during pertinent construction phases. If variations appear, we can provide further evaluation and supplemental recommendations. If variations are noted in the absence of our observation and testing services on-site, we should be immediately notified so that we can provide evaluation and supplemental recommendations.

Our Scope of Services does not include either specifically or by implication any environmental or biological (e.g., mold, fungi, bacteria) assessment of the site or identification or prevention of pollutants, hazardous materials or conditions. If the owner is concerned about the potential for such contamination or pollution, other studies should be undertaken.

Our services and any correspondence or collaboration through this system are intended for the sole benefit and exclusive use of our client for specific application to the project discussed and are accomplished in accordance with generally accepted geotechnical engineering practices with no third-party beneficiaries intended. Any third-party access to services or correspondence is solely for information purposes to support the services provided by Terracon to our client. Reliance upon the services and any work product is limited to our client, and is not intended for third parties. Any use or reliance of the provided information by third parties is done solely at their own risk. No warranties, either express or implied, are intended or made.

Site characteristics as provided are for design purposes and not to estimate excavation cost. Any use of our report in that regard is done at the sole risk of the excavating cost estimator as there may be variations on the site that are not apparent in the data that could significantly impact excavation cost. Any parties charged with estimating excavation costs should seek their own site characterization for specific purposes to obtain the specific level of detail necessary for costing. Site safety, and cost estimating including, excavation support, and dewatering requirements/design are the responsibility of others. If changes in the nature, design, or location of the project are planned, our conclusions and recommendations shall not be considered valid unless we review the changes and either verify or modify our conclusions in writing.

ATTACHMENTS

EXPLORATION AND TESTING PROCEDURES

Field Exploration

Type of Test	Number of Borings	Boring Depth (feet)	Planned Location
Hand Auger Borings (HABs)	2	3 to 4 feet	Existing Pavement
Hand Auger Borings (HABs)	4	3 to 5 feet	Proposed Drive Areas
Hand Auger Boring (HAB)	1	5 feet	Proposed Pond Area

Boring Layout and Elevations: Unless otherwise noted, Terracon personnel provided the boring layout. The test locations were located in the field by Terracon personnel utilizing a commercially available handheld Global Position System (GPS) unit which are typically considered accurate to within ±20 feet. The locations should be considered accurate only to the degree implied by the means and methods used to define them. If elevations and a more precise boring layout are desired, we recommend borings be surveyed following completion of fieldwork.

The field exploration was performed on October 23rd, 2020.

Subsurface Exploration Procedures:

Hand Auger Borings

Hand auger borings were conducted in general accordance with ASTM D 1452-80, Standard Practice for Soil Investigation and Sampling by Auger Borings. In this test, hand auger borings are drilled by rotating and advancing a bucket auger to the desired depths while periodically removing the auger from the hole to clear and examine the auger cuttings. The soils were classified in accordance with ASTM D 2488.

Laboratory Testing

The project engineer reviewed the field data and assigned laboratory tests to understand the engineering properties of the various soil strata, as necessary, for this project. Procedural standards noted below are for reference to methodology in general. In some cases, variations to methods were applied because of local practice or professional judgment. Standards noted below include reference to other, related standards. Such references are not necessarily applicable to describe the specific test performed.

- ASTM D2216 Standard Test Methods for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass
- ASTM D1140 Standard Test Methods for Determining the Amount of Material Finer than 75-µm (No. 200 Sieve in Soils by Washing

The laboratory testing program often included examination of soil samples by an engineer. Based on the material's texture and plasticity, we described and classified the soil samples in accordance with the Unified Soil Classification System.

SITE LOCATION AND EXPLORATION PLANS

Contents:

Site Location Plan
Exploration Plan

Note: All attachments are one page unless noted above.

SITE LOCATION

Lakewood Elementary School ■ Myrtle Beach, South Carolina
November 24, 2020 ■ Terracon Project No. ER205020

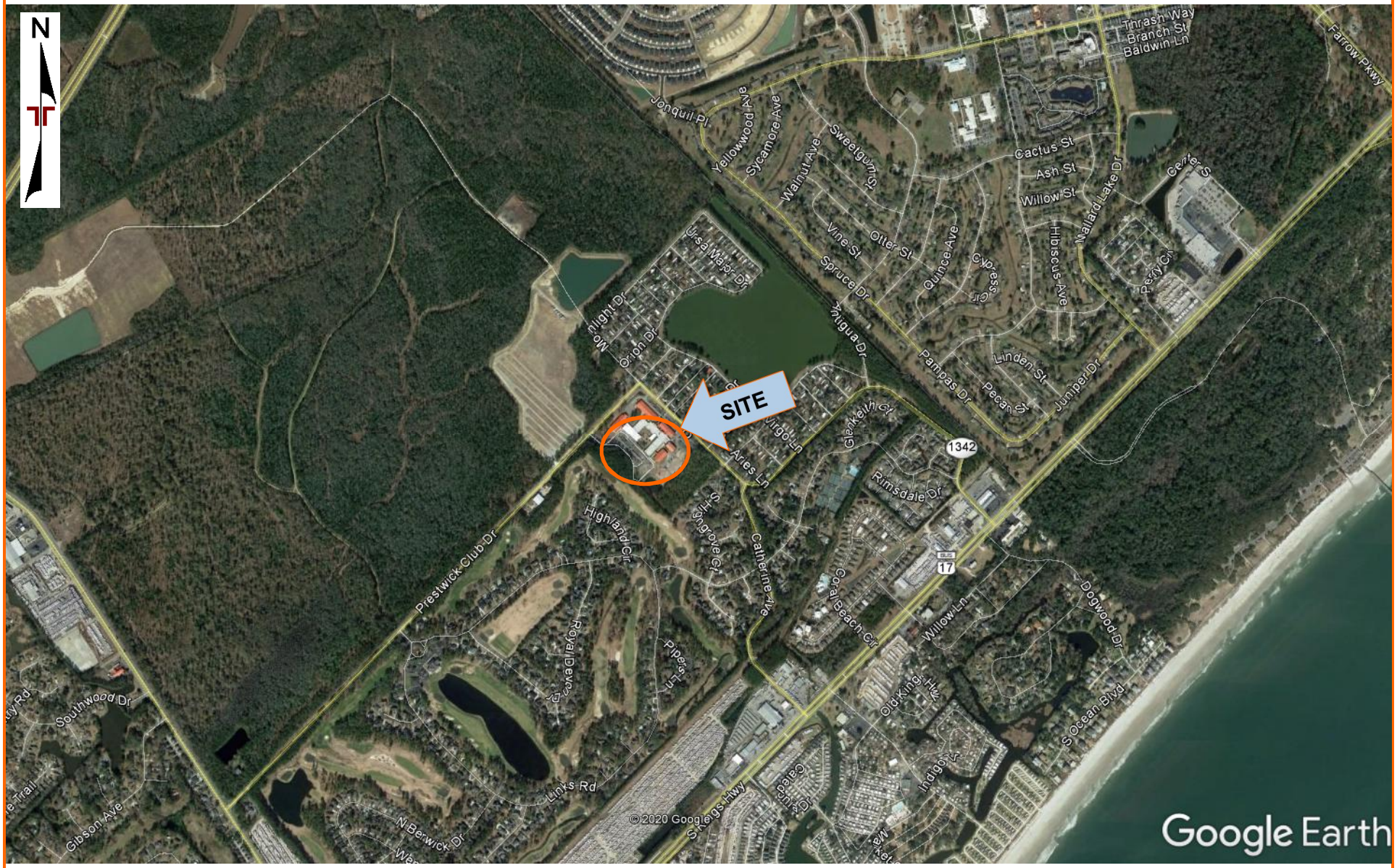


DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

MAP PROVIDED BY MICROSOFT BING MAPS

EXPLORATION PLAN

Lakewood Elementary School ■ Myrtle Beach, South Carolina
November 24, 2020 ■ Terracon Project No. ER205020

DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

MAP PROVIDED BY MICROSOFT BING MAPS

EXPLORATION RESULTS

Contents:

Hand Auger Boring Logs (HAB-01 through HAB-07)

Note: All attachments are one page unless noted above.

BORING LOG NO. HAB-01

PROJECT: Lakewood Elementary School Dropoff Loop

CLIENT: Mead & Hunt, Inc.
Myrtle Beach, SC

SITE: Prestwick Club Drive
Myrtle Beach, SC

LOCATION See Exploration Plan

DEPTH		DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	Field Test Results
0.2	**ASPHALT**, approximately 1 3/4 inches				
	MARINE LIMESTONE BASE COURSE, approximately 5 1/4 inches				
0.6	**POORLY GRADED SAND WITH SILT (SP-SM)**, brown, medium dense	1			7-15+
2.0	**SILTY SAND (SM)**, dark brown, loose	2			4-5-7
		3	▽		4-7-8
4.0	***Hole Collapse at 4 Feet***	4			6-7-9

Stratification lines are approximate. In-situ, the transition may be gradual.

Advancement Method:
Manual Hand Auger

Abandonment Method:
Boring backfilled with Auger Cuttings
Surface capped with asphalt

Notes:

WATER LEVEL OBSERVATIONS

▽ *Groundwater encountered at approximately 3 feet at time of boring*

Terracon
1246 Howard Ave
Myrtle Beach, SC

Boring Started: 10-23-2020 | Boring Completed: 10-23-2020

Drill Rig: | Driller:

Project No.: ER205020

BORING LOG NO. HAB-02

PROJECT: Lakewood Elementary School Dropoff Loop

CLIENT: Mead & Hunt, Inc.
Myrtle Beach, SC

SITE: Prestwick Club Drive
Myrtle Beach, SC

GRAPHIC LOG	LOCATION See Exploration Plan DEPTH	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	Field Test Results	Percent Fines (%)	Moisture Content (%)
	TOPSOIL						
	1.0 **POORLY GRADED SAND (SP)**, brown with gray, loose to medium dense	1			10-11-13	4.8	11.5
		2			4-5-5		
		3	▽		2-3-6		
	3.5 ***Hole Collapse at 3.5 Feet***						

Stratification lines are approximate. In-situ, the transition may be gradual.

Advancement Method:
Manual Hand Auger

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

Notes:

WATER LEVEL OBSERVATIONS

▽ *Groundwater encountered at approximately 3 feet at time of boring*

Terracon
1246 Howard Ave
Myrtle Beach, SC

Boring Started: 10-23-2020 | Boring Completed: 10-23-2020

Drill Rig: | Driller:

Project No.: ER205020

BORING LOG NO. HAB-03

PROJECT: Lakewood Elementary School Dropoff Loop

CLIENT: Mead & Hunt, Inc.
Myrtle Beach, SC

SITE: Prestwick Club Drive
Myrtle Beach, SC

LOCATION See Exploration Plan

DEPTH		DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	Field Test Results
0.2	**ASPHALT**, approximately 1 3/4 inches				
	MARINE LIMESTONE BASE COURSE, approximately 4 1/4 inches				
0.5	**POORLY GRADED SAND WITH SILT AND GRAVEL (SP-SM)**, brown, loose to medium dense	1			9-15+
		2	▽		4-4-5
3.0	***Hole Collapse at 3 Feet***	3			3-5-7

Stratification lines are approximate. In-situ, the transition may be gradual.

Advancement Method:
Manual Hand Auger

Abandonment Method:
Boring backfilled with Auger Cuttings
Surface capped with asphalt

Notes:

WATER LEVEL OBSERVATIONS

▽ *Groundwater encountered at approximately 2.5 feet at time of boring*

Terracon
1246 Howard Ave
Myrtle Beach, SC

Boring Started: 10-23-2020 | Boring Completed: 10-23-2020

Drill Rig: | Driller:

Project No.: ER205020

BORING LOG NO. HAB-04

PROJECT: Lakewood Elementary School Dropoff Loop

CLIENT: Mead & Hunt, Inc.
Myrtle Beach, SC

SITE: Prestwick Club Drive
Myrtle Beach, SC

LOCATION See Exploration Plan

DEPTH		DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	Field Test Results	Percent Fines (%)	Moisture Content (%)
	TOPSOIL						
0.5							
	POORLY GRADED SAND WITH SILT (SP-SM), gray to dark brown, medium dense					8.3	8.6
		1			8-10-11	11.8	13.5
2.0							
	POORLY GRADED SAND (SP), light brown, loose	2	▽		8-6-7		
3.0							
	Hole Collapse at 3 Feet	3			4-5-5		

Stratification lines are approximate. In-situ, the transition may be gradual.

Advancement Method:
Manual Hand Auger

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

Notes:

WATER LEVEL OBSERVATIONS

▽ *Groundwater encountered at approximately 2.5 feet at time of boring*

Terracon
1246 Howard Ave
Myrtle Beach, SC

Boring Started: 10-23-2020 | Boring Completed: 10-23-2020

Drill Rig: | Driller:

Project No.: ER205020

BORING LOG NO. HAB-05

PROJECT: Lakewood Elementary School Dropoff Loop

CLIENT: Mead & Hunt, Inc.
Myrtle Beach, SC

SITE: Prestwick Club Drive
Myrtle Beach, SC

LOCATION See Exploration Plan

DEPTH		Field Test Results	Percent Fines (%)	Moisture Content (%)
0.5	**TOPSOIL**			
1	**POORLY GRADED SAND WITH SILT (SP-SM)**, tan, loose	7-7-8	5.9	7.2
2		5-6-6		
3.0				
3	**POORLY GRADED SAND (SP)**, white, loose	6-5-6		
4		5-5-6		
5.0				
5	***Boring Terminated at 5 Feet***	4-5-7		

Stratification lines are approximate. In-situ, the transition may be gradual.

Advancement Method:
Manual Hand Auger

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater encountered at approximately 4.5 feet at time of boring

Terracon
1246 Howard Ave
Myrtle Beach, SC

Boring Started: 10-23-2020 | Boring Completed: 10-23-2020

Drill Rig: | Driller:

Project No.: ER205020

BORING LOG NO. HAB-06

PROJECT: Lakewood Elementary School Dropoff Loop

CLIENT: Mead & Hunt, Inc.
Myrtle Beach, SC

SITE: Prestwick Club Drive
Myrtle Beach, SC

LOCATION See Exploration Plan

DEPTH		GRAPHIC LOG	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	Field Test Results
	TOPSOIL					
0.5	**POORLY GRADED SAND WITH SILT (SP-SM)**, tan, loose		1			4-7-9
			2			5-5-5
3.0	**POORLY GRADED SAND (SP)**, white, loose		3			5-5-5
			4			6-5-6
5.0	***Boring Terminated at 5 Feet***		5			4-6-6

Stratification lines are approximate. In-situ, the transition may be gradual.

Advancement Method:
Manual Hand Auger

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

Notes:

WATER LEVEL OBSERVATIONS

No groundwater encountered

Terracon
1246 Howard Ave
Myrtle Beach, SC

Boring Started: 10-23-2020 | Boring Completed: 10-23-2020

Drill Rig: | Driller:

Project No.: ER205020

BORING LOG NO. HAB-07

PROJECT: Lakewood Elementary School Dropoff Loop

CLIENT: Mead & Hunt, Inc.
Myrtle Beach, SC

SITE: Prestwick Club Drive
Myrtle Beach, SC

GRAPHIC LOG	LOCATION See Exploration Plan DEPTH	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	Percent Fines (%)	Moisture Content (%)
	TOPSOIL 0.5					
	POORLY GRADED SAND (SP), light tan	1			4.4	5.9
		2				
		3				
		4	▽			
	4.5 **POORLY GRADED SAND WITH SILT (SP-SM)**, brown 5.0	5				
	Hole Collapse at 5 Feet					

Stratification lines are approximate. In-situ, the transition may be gradual.

Advancement Method:
Manual Hand Auger

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

Notes:

WATER LEVEL OBSERVATIONS

▽ *Groundwater encountered at approximately 4.5 feet at time of boring*

Terracon
1246 Howard Ave
Myrtle Beach, SC

Boring Started: 10-23-2020 | Boring Completed: 10-23-2020

Drill Rig: | Driller:

Project No.: ER205020

SUPPORTING INFORMATION

Contents:

Unified Soil Classification System
General Notes

Note: All attachments are one page unless noted above.

UNIFIED SOIL CLASSIFICATION SYSTEM

Terracon GeoReport

Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests [A]					Soil Classification	
					Group Symbol	Group Name [B]
Coarse-Grained Soils: More than 50% retained on No. 200 sieve	**Gravels:** More than 50% of coarse fraction retained on No. 4 sieve	**Clean Gravels:** Less than 5% fines [C]	$Cu \geq 4$ and $1 \leq Cc \leq 3$ [E]		GW	Well-graded gravel [F]
			$Cu < 4$ and/or [$Cc<1$ or $Cc>3.0$] [E]		GP	Poorly graded gravel [F]
		Gravels with Fines: More than 12% fines [C]	Fines classify as ML or MH		GM	Silty gravel [F, G, H]
			Fines classify as CL or CH		GC	Clayey gravel [F, G, H]
	Sands: 50% or more of coarse fraction passes No. 4 sieve	**Clean Sands:** Less than 5% fines [D]	$Cu \geq 6$ and $1 \leq Cc \leq 3$ [E]		SW	Well-graded sand [I]
			$Cu < 6$ and/or [$Cc<1$ or $Cc>3.0$] [E]		SP	Poorly graded sand [I]
		Sands with Fines: More than 12% fines [D]	Fines classify as ML or MH		SM	Silty sand [G, H, I]
			Fines classify as CL or CH		SC	Clayey sand [G, H, I]
Fine-Grained Soils: 50% or more passes the No. 200 sieve	**Silts and Clays:** Liquid limit less than 50	**Inorganic:**	PI > 7 and plots on or above "A"		CL	Lean clay [K, L, M]
			PI < 4 or plots below "A" line [J]		ML	Silt [K, L, M]
		Organic:	Liquid limit - oven dried	< 0.75	OL	Organic clay [K, L, M, N]
			Liquid limit - not dried			Organic silt [K, L, M, O]
	Silts and Clays: Liquid limit 50 or more	**Inorganic:**	PI plots on or above "A" line		CH	Fat clay [K, L, M]
			PI plots below "A" line		MH	Elastic Silt [K, L, M]
		Organic:	Liquid limit - oven dried	< 0.75	OH	Organic clay [K, L, M, P]
			Liquid limit - not dried			Organic silt [K, L, M, Q]
Highly organic soils:	Primarily organic matter, dark in color, and organic odor				PT	Peat

[A] Based on the material passing the 3-inch (75-mm) sieve.

[B] If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" to group name.

[C] Gravels with 5 to 12% fines require dual symbols: GW-GM well-graded gravel with silt, GW-GC well-graded gravel with clay, GP-GM poorly graded gravel with silt, GP-GC poorly graded gravel with clay.

[D] Sands with 5 to 12% fines require dual symbols: SW-SM well-graded sand with silt, SW-SC well-graded sand with clay, SP-SM poorly graded sand with silt, SP-SC poorly graded sand with clay.

[E] $Cu = D_{60}/D_{10}$ $\quad Cc = \dfrac{(D_{30})^2}{D_{10} \times D_{60}}$

[F] If soil contains ≥ 15% sand, add "with sand" to group name.

[G] If fines classify as CL-ML, use dual symbol GC-GM, or SC-SM.

[H] If fines are organic, add "with organic fines" to group name.

[I] If soil contains ≥ 15% gravel, add "with gravel" to group name.

[J] If Atterberg limits plot in shaded area, soil is a CL-ML, silty clay.

[K] If soil contains 15 to 29% plus No. 200, add "with sand" or "with gravel," whichever is predominant.

[L] If soil contains ≥ 30% plus No. 200 predominantly sand, add "sandy" to group name.

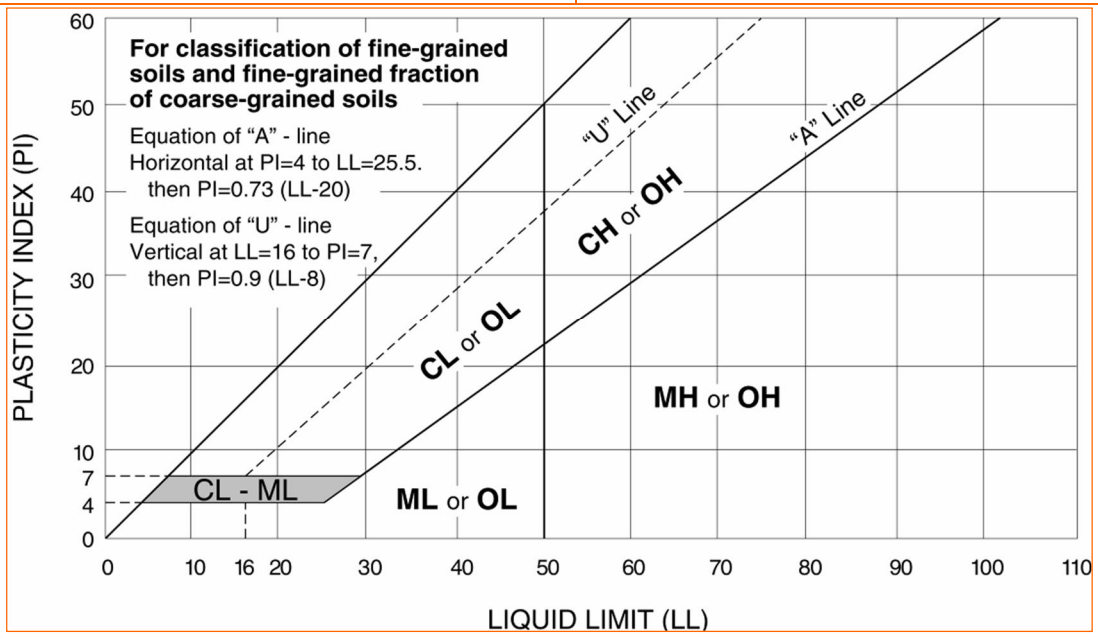
[M] If soil contains ≥ 30% plus No. 200, predominantly gravel, add "gravelly" to group name.

[N] PI ≥ 4 and plots on or above "A" line.

[O] PI < 4 or plots below "A" line.

[P] PI plots on or above "A" line.

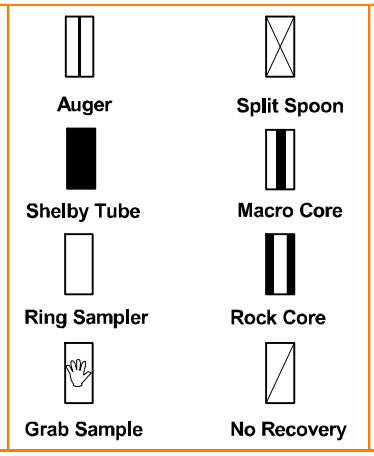
[Q] PI plots below "A" line.



GENERAL NOTES

DESCRIPTION OF SYMBOLS AND ABBREVIATIONS

SAMPLING



WATER LEVEL

Water Initially Encountered

Water Level After a Specified Period of Time

Water Level After a Specified Period of Time

Water levels indicated on the soil boring logs are the levels measured in the borehole at the times indicated. Groundwater level variations will occur over time. In low permeability soils, accurate determination of groundwater levels is not possible with short term water level observations.

FIELD TESTS

(HP)	Hand Penetrometer
(T)	Torvane
(b/f)	Standard Penetration Test (blows per foot)
(PID)	Photo-Ionization Detector
(OVA)	Organic Vapor Analyzer

DESCRIPTIVE SOIL CLASSIFICATION

Soil classification is based on the Unified Soil Classification System. Coarse Grained Soils have more than 50% of their dry weight retained on a #200 sieve; their principal descriptors are: boulders, cobbles, gravel or sand. Fine Grained Soils have less than 50% of their dry weight retained on a #200 sieve; they are principally described as clays if they are plastic, and silts if they are slightly plastic or non-plastic. Major constituents may be added as modifiers and minor constituents may be added according to the relative proportions based on grain size. In addition to gradation, coarse-grained soils are defined on the basis of their in-place relative density and fine-grained soils on the basis of their consistency.

LOCATION AND ELEVATION NOTES

Unless otherwise noted, Latitude and Longitude are approximately determined using a hand-held GPS device. The accuracy of such devices is variable. Surface elevation data annotated with +/- indicates that no actual topographical survey was conducted to confirm the surface elevation. Instead, the surface elevation was approximately determined from topographic maps of the area.

STRENGTH TERMS

RELATIVE DENSITY OF COARSE-GRAINED SOILS (More than 50% retained on No. 200 sieve.) Density determined by Standard Penetration Resistance Includes gravels, sands and silts.			CONSISTENCY OF FINE-GRAINED SOILS (50% or more passing the No. 200 sieve.) Consistency determined by laboratory shear strength testing, field visual-manual procedures or standard penetration resistance			
Descriptive Term (Density)	**Standard Penetration or N-Value Blows/Ft.**	**Ring Sampler Blows/Ft.**	**Descriptive Term (Consistency)**	**Unconfined Compressive Strength, Qu, tsf**	**Standard Penetration or N-Value Blows/Ft.**	**Ring Sampler Blows/Ft.**
Very Loose	0 - 3	0 - 6	Very Soft	less than 0.25	0 - 1	< 3
Loose	4 - 9	7 - 18	Soft	0.25 to 0.50	2 - 4	3 - 4
Medium Dense	10 - 29	19 - 58	Medium-Stiff	0.50 to 1.00	4 - 8	5 - 9
Dense	30 - 50	59 - 98	Stiff	1.00 to 2.00	8 - 15	10 - 18
Very Dense	> 50	≥ 99	Very Stiff	2.00 to 4.00	15 - 30	19 - 42
			Hard	> 4.00	> 30	> 42

RELATIVE PROPORTIONS OF SAND AND GRAVEL

Descriptive Term(s) of other constituents	Percent of Dry Weight
Trace	< 15
With	15 - 29
Modifier	> 30

GRAIN SIZE TERMINOLOGY

Major Component of Sample	Particle Size
Boulders	Over 12 in. (300 mm)
Cobbles	12 in. to 3 in. (300mm to 75mm)
Gravel	3 in. to #4 sieve (75mm to 4.75 mm)
Sand	#4 to #200 sieve (4.75mm to 0.075mm
Silt or Clay	Passing #200 sieve (0.075mm)

RELATIVE PROPORTIONS OF FINES

Descriptive Term(s) of other constituents	Percent of Dry Weight
Trace	< 5
With	5 - 12
Modifier	> 12

PLASTICITY DESCRIPTION

Term	Plasticity Index
Non-plastic	0
Low	1 - 10
Medium	11 - 30
High	> 30

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