REPORT OF PRELIMINARY GEOTECHNICAL AND STORMWATER INVESTIGATION

PROPOSED SCHOOL
5208 S. Haverhill Road
City of Greenacres
Palm Beach County, Florida

Prepared for:

PALM BEACH CHRISTIAN MINISTRIES, INC
4561 Hunting Trail
Lake Worth, Florida 33467

Prepared by:

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Project No.: 3346-99-001E
February 20, 2020

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Proposed School
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City of Greenacres
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APPENDICES

1.0 EXECUTIVE SUMMARY

Dynamic Earth, LLC (Dynamic Earth) has completed a preliminary geotechnical investigation at the subject site. The subsurface conditions encountered generally included natural coastal plain deposits. Based on the subsurface conditions encountered during this preliminary investigation, approved portions of the on-site soils are expected to be suitable for support of foundations for relatively lightly loaded structures bearing on conventional shallow foundations, provided they are properly inspected and prepared as detailed herein.

2.0 PROJECT DETAILS

The subject site is located at 5208 South Haverhill Road in the city of Greenacres, Palm Beach County, Florida. The site is bound to the north by the existing Tradewinds Middle School; to the east by athletic fields with residential property beyond; to the south by the existing Diamond View Elementary School; and to the west by Haverhill Road.

Subsequent to our field investigation, conceptual site plans were updated to include moving the proposed modular buildings to the south of the originally proposed location; moving the proposed student union building to the east; adding two restroom structures to the east near the proposed practice field; and an expansion to the existing church. Based on a February 6, 2020 *Conceptual Site Plan* prepared by Dynamic Engineering Consultants, PC (Dynamic), the proposed site development will include the construction of a Training Facility, Student Union, five Modular Classrooms, three modular restrooms, and an expansion to the existing church. The proposed structures are expected to occupy a building footprint area of 6,000 square feet; 2,400 square feet; 864 square feet each; and 637 square feet each. Additional site improvements include the construction of athletic fields, storage shed, bleachers, basketball court, pavement, utilities and potential stormwater management facilities.

The final structural loads have not been developed this time. Based on our experience with similar facilities, we assume that the maximum loads will be less than the following:

- Column– 60 kips;
- Wall – 1.5 kips per liner foot;
- Floor Slab – 100 pounds per square feet; and
- Pavement – 60,000 Equivalent Single Axle Loads (ESAL's).

3.0 SCOPE OF SERVICES

3.1 Field Investigation

Field exploration of the project site was conducted by means of four soil borings (identified as borings B-1 through B-4) and two soil probes (identified as P-1 through P-2). The borings were drilled with a truck mounted drill rig using hollow stem auger drilling techniques and soil probes were performed with hand-auger equipment. The test locations are shown on the accompanying *Test Location Plan*.

Test Location Summary Table		
Number	**Proposed Location**	**Final Depth (feet)**
B-1	Training Facility	25.0
B-2	Modular Building	25.0
B-3	Grass Area (Former Modular Building)	25.0
B-4		25.0
P-1	Stormwater Facility	5.0
P-2	Stormwater Facility	5.0

The soil borings and soil probes were completed in the presence of a Dynamic Earth engineer who performed field tests, recorded visual classifications, and collected samples of the various strata encountered. The test locations were located in the field using normal taping procedures and estimated right angles. These locations are presumed to be accurate within several feet.

Soil borings and standard penetration tests (SPTs) were conducted in general accordance with ASTM designation D 1586. The SPT resistance value (N) can be used as an indicator of the consistency of fine-grained soils and the relative density of coarse-grained soils. The N-value for various soil types can be correlated with the engineering behavior of earthworks and foundations. Groundwater level observations were recorded during and at the completion of field operations prior to backfilling the borings.

The soils encountered at soil probe location were classified in general conformance with the Field Book for Describing and Sampling Soils (Version 3), published by the National Soil Survey Center, Natural Resources Conservation Service, U.S. Department of Agriculture (USDA). Observations were made for groundwater and/or potential indicators for the seasonal high groundwater table per the South Florida Water Management District's *Environmental Resource Permit Information Manual 2014 – Determination of Seasonal High Groundwater Table (SHWT) page D-5*.

Infiltration testing was performed in general accordance with the South Florida Water Management District's *Environmental Resource Permit Information Manual 2014*. Detailed results of the infiltration testing are included in the appendix of this report.

Seasonal variations, temperature effects, man-made effects, and recent rainfall conditions may influence the levels of the groundwater, and the observed levels will depend on the permeability of the soils. While groundwater elevations derived from sources other than seasonally observed groundwater monitoring wells may not be representative of true groundwater levels.

3.2 Laboratory Testing

Physical/Textural Analysis: Each sample was visually classified in general accordance with ASTM D-2488. In addition, representative samples of selected strata encountered were subjected to a laboratory testing program which included, moisture content determinations (ASTM D-2216), Atterberg limits (ASTM D-4318), and washed gradation analyses (ASTM D-422) in order to perform supplementary engineering soil classifications in general accordance with ASTM D-2487. The soil strata tested were classified by the Unified Soil Classification System (USCS) and results of the laboratory testing are summarized in the following table.

LABORATORY TEST RESULTS							
Boring	**Sample No.**	**Depth (feet)**	**Moisture Content (%)**	**Liquid Limit**	**Plasticity Index**	**Percent Passing No. 200 (%)**	**USCS Classification**
B-4	S-1	0-2	6.4	Not Plastic		2.6	SP
	S-2	2-4	15.2	Not Plastic		4.4	SP
	S-3	4-6	19.1	Not Plastic		3.1	SP
	S-6	10-12	19.0	Not Plastic		4.7	SP

The engineering classifications are useful when considered in conjunction with the additional site data to estimate other properties of the soil types encountered and to predict the soil's behavior under construction and service loads.

4.0 SUMMARY OF SUBSURFACE CONDITIONS

4.1 Site Geology

The subject site is located in a region of the Gold Coast-Florida Bay District Physiographic District of Florida known as the Anastasia Formation. The Anastasia Formation is generally composed of interbedded light grey, tan, orangish-brown sands and coquinoid limestones.

4.2 United States Department of Agriculture (USDA) Soil Survey

Based on a review of the United States Department of Agriculture – Natural Resources Conservation Services (USDA-NRCS) soil survey the following soil resources are mapped underlying the site within the area of the proposed site improvements and are described below:

Myakka fine sand, zero to two percent slopes (21): Myakka fine sand with zero to two percent slopes is mapped within the eastern portion of the site. The typical soil profile (as detailed in the survey) consists of fine sand to a depth of 80 inches below the natural ground surface. The depth to the groundwater table is reported to be between six inches and 18 inches below the natural ground surface.

Immokalee fine sand, zero to two percent slopes (18): Immokalee fine sand with zero to two percent slopes is mapped within the western portion of the site. The typical soil profile (as detailed in the survey) consists of fine sand to a depth of 80 inches below the natural ground surface; the depth to the groundwater table is reported to be between six inches and 18 inches below the natural ground surface.

4.3 Subsurface Soil Profile

Details of the subsurface materials encountered are presented on the *Records of Subsurface Exploration* presented in the Appendix of this report. The subsurface soil conditions encountered in the soil borings consisted of the following generalized strata in order of increasing depth.

Surface Cover Material: Soil borings were performed within landscape areas and encountered up to four inches of topsoil at the surface or up to one inch of gravel.

Coastal Plain Deposits: Beneath the surficial cover, natural coastal plain deposits were encountered that generally consisted of sand (USCS: SP and SP-SM) with variable amounts of silt. The natural coastal plain deposits were encountered to termination depths up to approximately 25 feet below the ground surface. Standard Penetration Testing (SPT) N-values ranged between four blows per foot (bpf) and 13 bpf, and averaged eight bpf; generally indicating a relatively loose condition.

4.3 Groundwater

Groundwater was encountered within the soil borings at depths ranging between approximately 4.6 feet and 4.8 feet below the ground surface; corresponding to elevations ranging between 11.4 and 12.2 feet. Groundwater was encountered within soil probes at depths ranging between approximately 3.8 feet and 4.1 feet below the ground surface; corresponding to elevations ranging between 12 and 12.3 feet. Groundwater levels are expected to fluctuate seasonally, and following significant periods of precipitation.

5.0 PRELIMINARY CONCLUSIONS AND RECOMMENDATIONS

5.1 General

The following preliminary considerations are based on the soil conditions encountered during our limited subsurface investigation for the proposed site development and are intended to provide general characteristics of the subsurface conditions for preliminary planning purposes and should not be utilized for final design of structural foundations, floor slabs, or pavements. Final recommendations pertaining to the geotechnical aspects of the site development will need to be developed from a supplemental subsurface investigation and engineering analyses of the final site development plans.

Properly inspected and approved natural soils are expected to be suitable for support of relatively lightly loaded structures bearing of conventional shallow foundations and floor slab. **Dynamic Earth should remain involved in the project to perform supplemental geotechnical evaluation, plan review and/or evaluate foundation and floor slab subgrades with soil probes and Dynamic Cone Penetration (DCP) during construction.**

5.2 Preliminary Foundation Design Recommendations

Anticipated Bearing Strata: The proposed foundations are preliminary anticipated to be within on-site natural soils. Approved portions of the natural soils are expected to be suitable for support of relatively lightly loaded structures, provided they are properly tested and inspected as detailed herein.

Conventional Shallow Foundation Design Criteria: Dynamic Earth preliminarily recommends supporting the proposed structures on conventional shallow foundations bearing within approved natural soils and/or controlled compacted structural fill material. Foundations may preliminarily be designed to impart a maximum allowable bearing pressure of 2,000 pounds per square foot (psf). Regardless of loading conditions, proposed foundations should be sized no less than a minimum of 24 inches for continuous wall footings and 36 inches for isolated column footings.

Any footings subject to tension loads should be designed so that the maximum toe pressure due to the combined effect of vertical loads and overturning moment does not exceed the recommended maximum allowable net bearing pressure recommended above. In addition, positive contact pressure should be maintained throughout the base of the footings such that no uplift or tension exists between the base of the footings and the supporting soil. Uplift loads should be resisted by the weight of the concrete, side friction (vertical along the footer) should be neglected.

Lateral resistance should be provided by friction on the base of the footing. The following coefficient's of friction against sliding may be considered as part of the structural design.

- Formed concrete on gravel subbase material – 0.40;
- Mass concrete on gravel subbase material – 0.50; and
- Mass concrete on on-site natural soils - 0.35.

Inspection/Overexcavation Criteria: The suitability of the bearing soils along and below the footing bottoms must be verified by Dynamic Earth's geotechnical engineer prior to placing concrete. If looser conditions/densities are encountered at foundation subgrades during construction than encountered as part of our investigation, partial overexcavation and replacement may be required. If required, any overexcavation to be restored with structural fill (on-site or imported) will need to extend at least one foot laterally beyond footing edges for each vertical foot of overexcavation. Alternatively, lean concrete/Controlled Low-Strength Material (CLSM) or flowable fill material may be considered to minimize lateral overexcavation. Any overexcavation should extend to a suitable bearing stratum as detailed within this report. The bottom of overexcavations should be compacted with smooth drum rollers, walk-behind compactors, vibrating plates or plate tampers ("jumping jacks") to compact locally disturbed materials and densify underlying natural soil zones.

Settlement: Dynamic Earth preliminary estimates post construction settlements to be on the order of one inch if the recommendations outlined in this report are properly implemented. Differential settlements of foundations should be on the order of one-half inch. A settlement analysis should be performed once loading information is finalized for the proposed structure(s).

Embedment of Footings: The bottom of the footings should be embedded at least 18-inches below surrounding grade in order to provide confinement, or as required by local building code requirements.

5.3 Preliminary Floor Slab Recommendations

Dynamic Earth preliminarily anticipates that portions of the on-site soils may be suitable for support of the proposed floor slabs provided these materials are properly evaluated, compacted and proofrolled in accordance as detailed herein. Subgrade soils should be maintained relatively moist until floor slabs are constructed. If subgrades become desiccated prior to construction of the floor slabs, the affected material should be removed or the materials scarified, moistened and recompacted. Any areas that become softened or disturbed as a result of wetting and/or repeated exposure to construction traffic should be removed and replaced with compacted structural fill. The on-site soils will yield a minimum subgrade modulus (k) of 100 psi/in.

A vapor barrier should be considered beneath concrete slab-on-grade that will be covered with moisture sensitive/impervious coverings (such as wood, tile, carpet, etc) or moisture sensitive equipment. When conditions warrant the use of a vapor barrier, the slab designer and contractor should refer to the American Concrete Institute (ACI) and Florida Building code regarding moisture for procedures and cautions regarding the use of a vapor barrier. The Florida Building code and local requirements should be consulted for what vapor barrier may be used.

5.4 Preliminary Pavement Recommendations

General: Dynamic Earth preliminarily anticipates that the on-site soils will be suitable for support of proposed pavements provided these materials are properly evaluated, compacted and proofrolled in accordance with Sections 5.2 and 5.3 of this report. This pavement design is based on the assumed traffic, which consists of automobile parking and a few lightly loaded delivery/box trucks. If heavier traffic is anticipated, such as more extensive truck traffic, Dynamic Earth should be contacted to provide a specific heavy duty pavement section. If encountered, existing fill material may need to be overexcavated and replaced below pavement subgrades.

Design Criteria: A design California Bearing Ratio (CBR) value of seven has been assigned to the anticipated properly prepared fill soils for pavement design purposes. This value was correlated with pertinent soil support values and assumed traffic loads to prepare flexible and rigid pavement designs per the AASHTO *Guide for the Design of Pavement Structures.*

Pavement Sections: The recommended flexible pavement section is presented below in tabular format:

PRELIMINARY RECOMMENDED FLEXIBLE PAVEMENT SECTION (USING A STABILIZED SUBGRADE)			
Layer	**Material**	**Thickness (Inches)**	
		Standard Duty	**Heavy Duty**
Surface	PG 67-22 SP 9.5	2.5	2.5
Base	Lime Rock, (minimum LBR=100) or Recycled Concrete Aggregate (minimum LBR=150), compacted to 98% of the maximum dry density of a modified proctor	6.0	8.0
Subbase	Stabilized Subbase fill (minimum LBR=40) compacted to 95% maximum dry density of a modified proctor	12.0	12.0

A rigid concrete pavement should be used to provide suitable support at areas of high traffic or severe turns (such as driveway aprons or loading areas). The recommended rigid pavement is presented below in tabular format:

PRELIMINARY RECOMMENDED PRELIMINARY RIDGED PAVEMENT SECTION			
Layer	**Material**	**Thickness (Inches)**	
		Standard Duty	**Heavy Duty**
Surface	4,000 psi air-entrained concrete	5.0	6.0
Base	Stabilized Subbase fill (minimum LBR=40) compacted to 95% maximum dry density of a modified proctor	12.0	12.0

Additional Design Considerations: The pavement section thickness designs presented in this report are based on the design parameters detailed herein and are contingent on proper construction, inspection, and maintenance. The designs are contingent on achieving the minimum soil support value in the field. To accomplish this requirement, all subgrade soil and supporting fill or backfill must be placed, prepared, and evaluated as detailed in Sections 5.2 and 5.3 of this report. Proper drainage must be provided for the pavement structure including appropriate grading and surface water control, as well as measures to drain water from the subgrade such as bleeder drains at inlets.

The performance of the pavement also will depend on the quality of materials and workmanship. Dynamic Earth recommends that Florida State Department of Transportation (FDOT) standards for materials, workmanship, and maintenance be applied to this site. Project specifications should include verifying that the installed asphaltic concrete material composition is within tolerance for the specified materials and that the percentage of air voids of the installed pavement is within specified ranges for the respective materials. All rigid concrete pavements should be suitably air-entrained, jointed, and reinforced.

5.6 Preliminary Groundwater Considerations

Groundwater Control: Dynamic Earth anticipates that the groundwater level will be slightly deeper than the majority of the proposed foundation and utility excavations.

If required, excavations extending to depths of approximately two feet below static groundwater elevation may typically be controlled by sump pumps and strategically placed sump pits in and adjacent to excavations for relatively small areas. Larger excavations and excavations extending deeper than two feet below groundwater may require deeper well recovery points. Surface water

runoff must be controlled and diverted away from construction areas by grading and limiting the exposure of excavations to rainfall.

5.7 Preliminary Earthwork Considerations

Surface Cover Stripping: Prior to stripping operations, all utilities should be identified and secured. The surface cover materials, including vegetation, topsoil, pavements, and gravel etc. should be removed from within, and at least five feet beyond, the limits of the proposed building and new pavement areas as well as any other area which will require fill placement. If required, removal of any trees should include root mats and tree stumps.

Subgrade Protection and Inspection: Every effort should be made to minimize disturbance of the on-site soils by construction traffic and surface runoff. The predominantly sandy soils typically dry quickly and can require wetting during hot, dry periods to attain proper compaction. Therefore, the contractor should be responsible for maintaining and protecting exposed subgrade soils during construction. Dynamic Earth should be retained as the Geotechnical Engineer of Record to inspect soil conditions during construction and verify the suitability of prepared foundation, floor slab and pavement subgrades for support of design loads.

Surface Preparation/Proofrolling: Prior to placing any fill or subbase materials to raise or restore grades to the desired building pad or pavement subgrade elevations, the existing exposed soils should be compacted to a firm and unyielding surface with several passes in two perpendicular directions of minimum 20-ton vibratory, smooth drum roller during favorable moisture conditions. The surface then should be proofrolled with a loaded tandem axle truck in the presence of Dynamic Earth to help identify soft or loose pockets which may require removal and replacement or further investigation. Dynamic Earth anticipates at least partial overexcavation if the subgrade is wetted or subjected to repeated construction traffic. Any fill or backfill should be placed and compacted in accordance with Section 5.3.

Import/On-site Structural Fill Material: Soils placed as structural fill material should consist of well graded sand or gravel with a maximum particle size of three inches in diameter and less than 15 percent of material passing the number 200 sieve. These materials should be free of objectionable debris (clay clumps, organic and/or deleterious material, etc.) and within moisture contents suitable for compaction. Alternative soil types with higher percentages of silt and clay may be considered, provided that the contractor is able to achieve proper compaction and maintain suitable subgrade once the material is placed. Fine-grained soils and/or granular soils with higher percentages of silt and clay are extremely moisture sensitive and will only be suitable for reuse as structural fill material under ideal weather conditions. Materials wetted beyond the optimum moisture content; that contain oversized rock or debris; or with increased amounts of objectionable debris will not be suitable for reuse as structural fill material without special handling. As such,

the contractor should be responsible for importing structural fill material and/or processing on-site soils as required so that these materials are suitable for structural fill placement.

If encountered cobbles, boulders and/or oversized debris greater than three inches in diameter will need to be separated from material to be placed as structural fill. Approved material between three to 12 inches in diameter may be crushed or individually placed in fill layers deeper than two feet below proposed subgrade levels. Care must be taken to individually seat any large particles and to compact soil around large particles with hand operated equipment to minimize the risk of void formation. The larger material should not be placed near areas of the proposed utility or planned excavation. Boulders larger than approximately 12 inches are not expected to be adequate for use as fill or backfill and should be removed from the site or crushed to an adequate size.

The on-site soils include natural coastal plain deposits. The natural coastal plain deposits above the groundwater level are preliminarily expected to be suitable for reuse as structural fill material, provided deleterious debris (if encountered) is removed and moisture contents are within tolerable limits to achieve compaction. Reuse of these materials will be contingent upon further evaluation during construction.

Submerged Fill: If required, backfill at excavations that extend below the groundwater level (in conjunction with dewatering methods) may consist of nominally three quarter inch, crushed stone (such as AASHTO #57 Stone) placed to raise grade above water levels before subsequent lifts of structural fill. Submerged fill should be separated from surrounding soils with a fines barrier geotextile, such as Mirafi 700X or equivalent to prevent future mitigation of fines content from surrounding soils.

Compaction and Placement Requirements: Structural fill and backfill should be placed in maximum 12 inch loose lifts and compacted to 95 percent of the maximum dry density within a targeted two percent of the optimum moisture content as determined by ASTM D 1557 (Modified Proctor). Variations in moisture content may be acceptable subject to Dynamic Earth's on-site geotechnical engineer's approval if the contractor is able to achieve the necessary compaction. Dynamic Earth recommends using a minimum 20-ton smooth drum roller to compact subgrade soils beneath pavements or slabs and hand operated vibratory jumping jacks and plate compactors within confined excavations for foundations or utilities. The drum roller should be operated in the static mode or a kneading "sheepsfoot" roller should be used to compact fine-grained soils. Fill material compacted with hand operated equipment, static drum roller and/or sheepsfoot roller, may need to be placed in thinner, loose lifts and an increased number of passes may be required to achieve proper compaction.

Structural Fill Testing: Before filling operations begin, representative samples of each proposed fill material (on-site and imported) should be collected. The samples should be tested to determine

the maximum dry density, optimum moisture content, natural moisture content, gradation, and plasticity of the soil. These tests are needed for quality control during compaction and also to determine if the fill material is acceptable. The placement of all fill and backfill will need to be monitored by Dynamic Earth to ensure that the specified material and lift thicknesses are properly installed. A sufficient number of in-place density tests should be performed during fill placement to ensure that the specified compaction is achieved throughout the height of the fill or backfill.

5.8 Retaining Walls and Lateral Earth Pressure Recommendations

Proposed retaining wall structures have not been identified at this time. Dynamic Earth should be notified if structures requiring lateral earth pressure recommendations are required.

5.9 Temporary Excavations

The natural soils encountered during the investigation are consistent with Type C Soil Conditions as defined by 29 CFR Part 1926 (OSHA) which require a maximum unbraced excavation angle of 1.5:1 (horizontal:vertical). Actual conditions encountered during construction should be evaluated by a competent person (as defined by OSHA) to ensure that safe excavation methods and/or shoring and bracing requirements are implemented.

5.9 Seasonal High Groundwater and Infiltration Testing

Seasonal High Groundwater and Soil Permeability: Evidence of seasonal high groundwater was encountered within anticipated stormwater management facilities at depths ranging between approximately 1.4 and 2.2 feet below the ground surface, corresponding to elevations ranging between approximately 15.7 feet mse and 14.6 feet. Hydraulic conductivity test results ranged between an 2.18 and 8.57 feet per day (ft/day). A summary of the groundwater and infiltration testing are presented in the following table:

GROUNDWATER AND INFILTRATION TEST SUMMARY								
Location	Surface Elevation	Estimated Seasonal High Groundwater		Groundwater		Hydraulic Conductivity Test Results		
		Depth (feet)	Elevation (feet)	Depth (feet)	Elevation (feet)	Test Depth (feet)	(cfs/ft^2)	(ft/day)
P-1/SPT-1	17.1	1.4	15.7	4.8	12.3	6.0	9.92x10^-5	8.57
P-2/SPT-2	16.8	2.2	14.6	4.8	12.0	6.0	2.52x10^-5	2.18

5.10 Supplemental Evaluation and Investigation

Final Design: Since these preliminary geotechnical investigation activities have been completed during the initial design phase, many critical assumptions or preliminarily details regarding assumed structural loads, existing and proposed elevations, etc. affect the geotechnical analysis. The preliminary considerations presented herein should be considered to help develop the optimum site design and grading, and Dynamic Earth should remain involved during final design. Supplemental investigation with soil borings and standard penetration testing with specific geotechnical recommendations should be developed as the design progresses and/or to satisfy tenant/building code specific geotechnical requirements.

Construction Monitoring and Testing: The recommendations presented herein are contingent on the owner retaining Dynamic Earth to perform inspection, testing, and consultation during construction as described in previous sections of this report. **Construction phase evaluation by means of dynamic cone penetrometer (DCP) testing should be performed on the existing fill material and natural soils in order to confirm design bearing capacities for the proposed structures.** Monitoring and testing should also be performed to verify that suitable materials are used for controlled fill, and that they are properly placed and compacted over suitable subgrade soils. Testing of fill placement will also be critical to limiting differential settlement.

6.0 GENERAL COMMENTS AND LIMITATIONS

Supplemental recommendations will be required upon finalization of conceptual site plans or if significant changes are made in the characteristics or location of the proposed structures. Dynamic Earth should be included as a consultant to the design team and should be provided final plans for review to confirm these criteria apply or to modify recommendations as necessary.

The recommendations presented herein should be utilized by a qualified engineer in preparing preliminary design concepts and site grading. The engineer should consider these recommendations as minimum physical standards that may be superseded by local and regional building codes and structural considerations. These recommendations are prepared for the use of the client for the specific project detailed and should not be used by any third party. These recommendations are relevant to the preliminary design phase and should not be substituted for construction specifications.

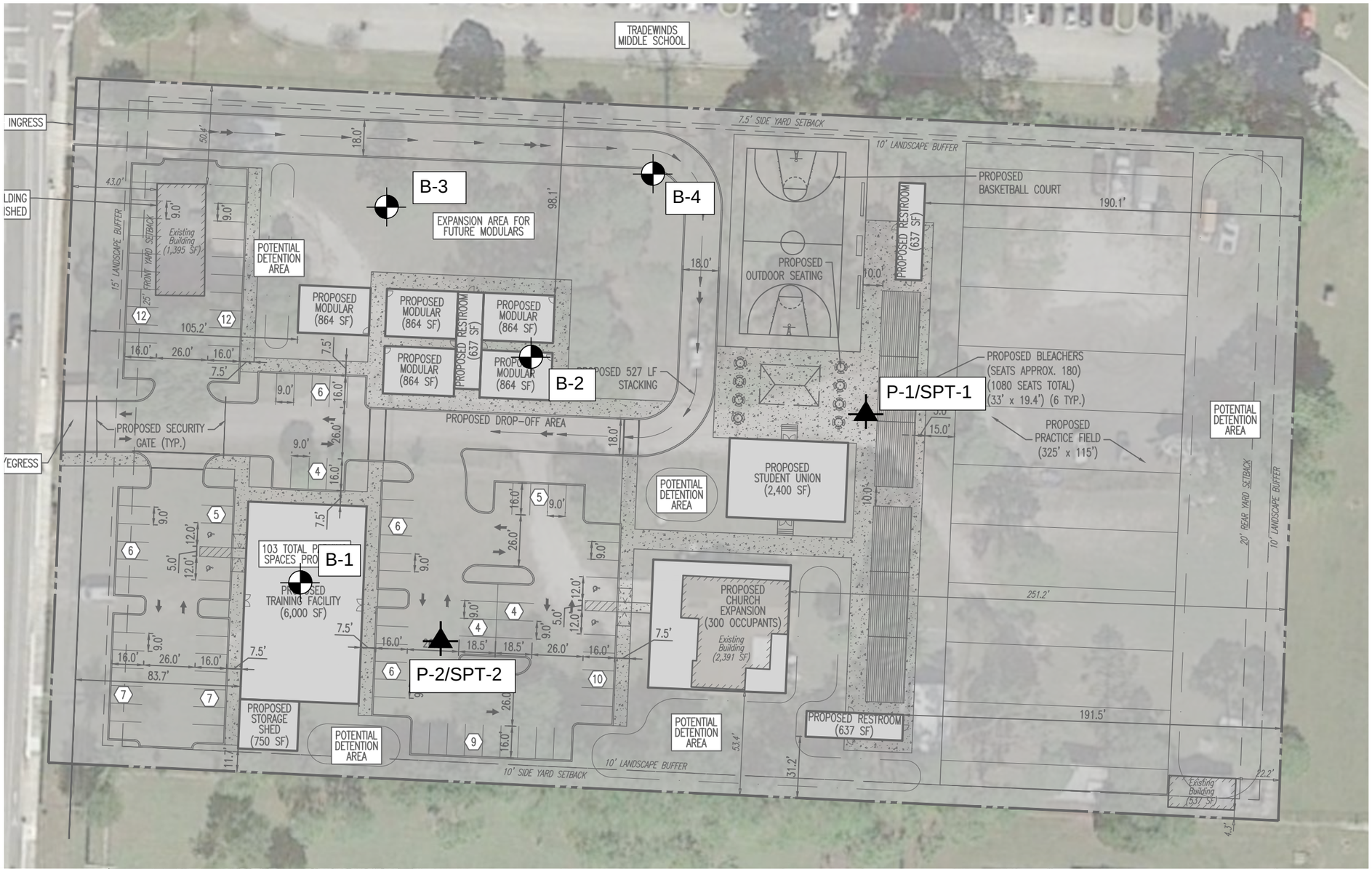
The possibility exists that conditions between test locations may differ from those at specific test pit locations, and conditions may not be as anticipated by the designers or contractors. In addition, the construction process may itself alter soil conditions. Therefore, Dynamic Earth Geotechnical Engineers or their representatives should observe and document the final construction procedures used and the conditions encountered, as well as conduct testing and inspection to ensure the design criteria are met or recommendations to address deviations are implemented.

Dynamic Earth assumes that a qualified contractor will be employed to perform the construction work, and that the contractor will be required to exercise care to ensure all excavations are performed in accordance with applicable regulations and good practice. Particular attention should be paid to avoiding damaging or undermining adjacent properties and maintaining slope stability.

The exploration and analysis of the foundation conditions reported herein are presented to form a reasonable basis for preliminary site evaluation. The recommendations submitted for the proposed construction are based on the available soil information and the preliminary design details furnished or assumed. Deviations from the noted subsurface conditions encountered during construction should be brought to the attention of the geotechnical engineer.

The geotechnical engineer warrants that the findings, recommendations, specifications, or professional advice contained herein have been promulgated after being prepared in accordance with generally accepted professional engineering practice in the fields of foundation engineering, soil mechanics, and engineering geology. No other warranties are implied or expressed.

Boring Location Plan



SCALE: N.T.S.	JOB No: 3346-99-001E
SHEET No: 1 OF 2	DRAWN BY: BH DESIGNED BY: - CHECKED BY: PG
	DATE: 02/07/2020

TITLE:

TEST LOCATION PLAN

PROJECT: **PALM BEACH CHRISTIAN MINISTRIES, INC.**

Proposed Charter School

52nd Court North
West Palm Beach, Palm Beach County
Florida

Rev. # 1 | DEC Client Code: 3346

LEGEND:

B-X — APPROXIMATE LOCATION OF SOIL BORING

P-X/SPT-X — APPROXIMATE LOCATION OF SOIL PROBE AND EXFILTRATION TESTING

NOTES:
1. THIS PLAN IS NOT FOR CONSTURCTION AND WAS PREPARED TO ILLUSTRATE TEST LOCATIONS ONLY AND MAY NOT REFLECT THE MOST CURRENT REVISION OF THE BASE PLAN.
2. THIS PLAN HAS BEEN PREPARED BASED ON CONCEPTUAL SITE PLAN PREPARED BY DYNAMIC ENIGEERING DATED 02/06/2020.

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SCALE: N.T.S.

JOB No: 3346-99-001E

SHEET No: 2 OF 2

DRAWN BY: JSS

DESIGNED BY: -

CHECKED BY: PG

DATE: 02/13/2020

TITLE:

TEST LOCATION PLAN

PROJECT: **PALM BEACH CHRISTIAN MINISTRIES, INC.**
Proposed Charter School
52nd Court North
West Palm Beach, Palm Beach County
Florida

Rev. # 0

DEC Client Code: 3346

LEGEND:

B-X — APPROXIMATE LOCATION OF SOIL BORING

P-X/SPT-X — APPROXIMATE LOCATION OF SOIL PROBE AND EXFILTRATION TESTING

NOTES:
1. THIS PLAN IS NOT FOR CONSTURCTION AND WAS PREPARED TO ILLUSTRATE TEST LOCATIONS ONLY AND MAY NOT REFLECT THE MOST CURRENT REVISION OF THE BASE PLAN.
2. THIS PLAN HAS BEEN PREPARED BASED ON A SOIL MAP PREPARED BY WEB SOIL SURVEY.

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Records of Subsurface Exploration

DYNAMIC EARTH

BOREHOLE LOG

Boring No : B-1

Project:	Proposed Charter School	**Proj. No.:**	3346-99-001E
Location:	52nd Courth North, West Palm Beach, Palm Beach County, Florida	**Client:**	Palm Beach Christian Ministries, Inc

				Groundwater Data	Depth (ft)	El. (mse)	Additional Groundwater Data	Depth (ft)	El. (mse)
Surface Elevation:	16.6	**Date Started:**	02-04-2020						
Termination Depth:	25.0 feet	**Date Completed:**	02-04-2020						
Proposed Location:	Building	**Logged by:**	B. Hertzig	**While Drilling:** ▽	4.6	12.0			
Drill/Test Method:	Mud rotary	**Contractor:**	Geox Inc.	**At Completion:** ▼	4.6	12.0			
Hammer Type:	Auto	**Rig Type:**	CME 55						

Sample Information							Depth (ft)	Strata	DESCRIPTION OF MATERIALS (Classification)	Remarks
Depth (Feet)	Number	Type	Rec (in)	RQD %	Blows per 6" or drill time (min/ft)	N				
0.0-2.0	S-1	SS	18	--	1 3 / 5 5	8		Surface Cover	4 inch topsoil Dark gray medium to fine sand, trace silt, trace fine roots, moist, loose (SP) Gray medium to fine sand, trace silt, moist, loose (SP)	
2.0-4.0	S-2	SS	18	--	3 4 / 4 5	8			Strong brown medium to fine sand, trace silt, moist, loose (SP)	
4.0-6.0	S-3	SS	20	--	4 5 / 5 5	10	5 ▼		Light brown medium to fine sand, trace silt, trace organic fibers, moist to wet, medium dense (SP)	
6.0-8.0	S-4	SS	20	--	3 2 / 2 2	4			Light brown medium to fine sand, trace silt, wet, loose (SP)	
8.0-10.0	S-5	SS	20	--	3 4 / 6 6	10			As above, trace shell fragments, medium dense (SP)	
10.0-12.0	S-6	SS	18	--	3 2 / 4 6	6	10		As above, loose (SP) Black medium to fine sand, trace silt, wet, loose (SP)	
								Coastal Plain Deposits		
13.0-15.0	S-7	SS	20	--	2 4 / 6 7	10			Brown medium to fine sand, trace silt, trace shell fragment, wet, medium dense (SP)	
							15			
18.0-20.0	S-8	SS	18	--	2 3 / 4 6	7			Brown medium to fine sand, trace silt, wet, loose (SP)	
							20			
23.0-25.0	S-9	SS	12	--	3 4 / 4 4	8			Light brown medium to fine sand, trace silt, loose (SP)	
									Boring B-1 was terminated approximately 25.0 feet below the ground surface.	

DYNAMIC EARTH

BOREHOLE LOG

Boring No : B-2

Project:	Proposed Charter School	**Proj. No.:**	3346-99-001E
Location:	52nd Courth North, West Palm Beach, Palm Beach County, Florida	**Client:**	Palm Beach Christian Ministries, Inc

Surface Elevation:	16.8	**Date Started:**	02-04-2020	**Groundwater Data**	**Depth**	**El.**	**Additional Groundwater Data**	**Depth**	**El.**
Termination Depth:	25.0 feet	**Date Completed:**	02-04-2020		**(ft)**	**(mse)**		**(ft)**	**(mse)**
Proposed Location:	Building	**Logged by:**	B. Hertzig	**While Drilling:** ▽	4.6	12.2			
Drill/Test Method:	Mud rotary	**Contractor:**	Geox Inc.	**At Completion:** ▼	4.6	12.2			
Hammer Type:	Auto	**Rig Type:**	CME 55						

Sample Information									
Depth (Feet)	Number	Type	Rec (in)	RQD %	Blows per 6" or drill time (min/ft)	N	Depth (ft)	Strata	DESCRIPTION OF MATERIALS (Classification)	Remarks
0.0-2.0	S-1	SS	16	--	4 3 5 5	8		Surface Cover	1" Gravel Light gray medium to fine sand, trace silt, moist, loose (SP) Yellow medium to fine sand, trace silt, moist, loose (SP)	
2.0-4.0	S-2	SS	18	--	5 4 5 4	9			Dark brown medium to fine sand, little silt, moist, loose (SP-SM)	
4.0-6.0	S-3	SS	20	--	5 5 4 4	9	5 ▼		Light brown medium to fine sand, trace silt, moist to wet, loose (SP)	
6.0-8.0	S-4	SS	18	--	1 2 3 5	5			Light yellow medium to fine sand, trace silt, wet, loose (SP)	
8.0-10.0	S-5	SS	14	--	3 4 8 9	12			Light gray medium to fine sand, trace silt, wet, medium dense (SP)	
10.0-12.0	S-6	SS	14	--	4 6 7 10	13	10		Light brown medium to fine sand, trace silt, trace shell fragments, wet, medium dense (SP)	
								Coastal Plain Deposits		
13.0-15.0	S-7	SS	18	--	4 3 3 7	6			Black medium to fine sand, trace silt, wet, loose (SP) Dark brown medium to fine sand, trace silt, wet, loose (SP)	
							15			
18.0-20.0	S-8	SS	20	--	2 2 3 7	5			Brown medium to fine sand, trace silt, wet, loose (SP)	
							20			
23.0-25.0	S-9	SS	20	--	2 3 5 6	8			Light brown medium to fine sand, trace silt, loose (SP)	
									Boring B-2 was terminated approximately 25.0 feet below the ground surface.	

DYNAMIC EARTH

BOREHOLE LOG

Boring No : B-3

Project:	Proposed Charter School	**Proj. No.:**	3346-99-001E
Location:	52nd Courth North, West Palm Beach, Palm Beach County, Florida	**Client:**	Palm Beach Christian Ministries, Inc

Surface Elevation:	18.1	**Date Started:**	02-04-2020	**Groundwater Data**	**Depth**	**El.**	**Additional Groundwater Data**	**Depth**	**El.**
Termination Depth:	25.0 feet	**Date Completed:**	02-04-2020		**(ft)**	**(mse)**		**(ft)**	**(mse)**
Proposed Location:	Building	**Logged by:**	B. Hertzig	**While Drilling:** ▽	4.7	11.4			
Drill/Test Method:	Mud rotary	**Contractor:**	Geox Inc.	**At Completion:** ▼	4.7	11.4			
Hammer Type:	Auto	**Rig Type:**	CME 55						

Sample Information							Depth (ft)	Strata	DESCRIPTION OF MATERIALS (Classification)	Remarks
Depth (Feet)	Number	Type	Rec (in)	RQD %	Blows per 6" or drill time (min/ft)	N				
0.0-2.0	S-1	SS	16	--	2 3 / 5 6	8		Surface Cover	3" Topsoil Light gray medium to fine sand, trace silt, moist, loose (SP) Yellow medium to fine sand, trace silt, moist, loose (SP)	
2.0-4.0	S-2	SS	18	--	3 3 / 4 5	7			Brown medium to fine sand, little silt, moist, loose (SP-SM)	
4.0-6.0	S-3	SS	18	--	3 3 / 4 4	7	▼ 5		Light brown medium to fine sand, trace silt, trace organic fibers, moist to wet, loose (SP)	
6.0-8.0	S-4	SS	18	--	3 4 / 5 5	9			Light gray medium to fine sand, trace silt, trace shell fragements, wet, loose (SP)	
8.0-10.0	S-5	SS	20	--	2 3 / 4 4	7	10		As above (SP)	
10.0-12.0	S-6	SS	18	--	3 3 / 2 2	5			Light brown medium to fine sand, trace silt, trace shell fragments, wet, medium dense (SP) Black medium to fine sand, trace silt, wet, loose (SP)	
								Coastal Plain Deposits	As above, medium dense (SP)	
13.0-15.0	S-7	SS	16	--	3 4 / 7 8	11	15		Light brown medium to fine sand, trace silt, wet, medium dense (SP)	
18.0-20.0	S-8	SS	14	--	2 3 / 4 4	7	20		Light brown medium to fine sand, trace silt, trace shell fragments, wet, loose (SP)	
23.0-25.0	S-9	SS	12	--	2 4 / 3 3	7			As above, light gray (SP)	
									Boring B-3 was terminated approximately 25.0 feet below the ground surface.	

DYNAMIC EARTH

BOREHOLE LOG

Boring No : B-4

Project:	Proposed Charter School	**Proj. No.:**	3346-99-001E
Location:	52nd Courth North, West Palm Beach, Palm Beach County, Florida	**Client:**	Palm Beach Christian Ministries, Inc

Surface Elevation:	16.6	**Date Started:**	02-04-2020	**Groundwater Data**	**Depth (ft)**	**El. (mse)**	**Additional Groundwater Data**	**Depth (ft)** / **El. (mse)**
Termination Depth:	25.0 feet	**Date Completed:**	02-04-2020					
Proposed Location:	Building	**Logged by:**	B. Hertzig	**While Drilling:** ▽	4.8	11.8		
Drill/Test Method:	Mud rotary	**Contractor:**	Geox Inc.	**At Completion:** ▼	4.8	11.8		
Hammer Type:	Auto	**Rig Type:**	CME 55					

Sample Information								Depth (ft)	Strata	DESCRIPTION OF MATERIALS (Classification)	Remarks
Depth (Feet)	Number	Type	Rec (in)	RQD %	Blows per 6" or drill time (min/ft)		N				
0.0-2.0	S-1	SS	16	--	2	3	7		Surface Cover	2" Topsoil Light gray medium to fine sand, trace silt, moist, loose (SP)	
					4	4					
2.0-4.0	S-2	SS	18	--	3	3	8			Dark Brown trace silt, trace roots, moist, loose (SP) Light brown medium to fine sand, trace silt, trace root fibers, moist, loose (SP)	
					5	5					
4.0-6.0	S-3	SS	20	--	3	3	6	5		Light brown medium to fine sand, trace silt, moist trace fine roots, loose (SP)	
					3	3					
6.0-8.0	S-4	SS	20	--	4	4	10			Light brown medium to fine sand, trace silt, wet, medium dense (SP) White medium to fine sand, trace silt, trace shell fragements, wet, medium dense (SP)	
					6	6					
8.0-10.0	S-5	SS	12	--	2	3	7			Light gray medium to fine sand, trace silt, trace shell fragments, wet, loose (SP)	
					4	4		10			
10.0-12.0	S-6	SS	14	--	1	3	6			As above (SP) Black medium to fine sand, trace silt, wet, loose (SP)	
					3	4					
									Coastal Plain Deposits		
13.0-15.0	S-7	SS	16	--	2	3	7			Dark Brown medium to fine sand, little silt, wet, loose (SP)	
					4	4		15			
18.0-20.0	S-8	SS	18	--	WOH	2	4			Light brown medium to fine sand, trace silt, trace shell fragments, wet, loose (SP)	
					2	3		20			
23.0-25.0	S-9	SS	12	--	3	4	9			As above, white (SP)	
					5	5					
										Boring B-4 was terminated approximately 25.0 feet below the ground surface.	

Laboratory Test Results

DYNAMIC EARTH

SOIL PROFILE PIT LOG

Soil Profile Pit: P-1

Project: Proposed Charter School
Project No.: 3346-99-001EC
Location: 52nd Court North, West Palm Beach, Palm Beach County, Florida
Client: Palm Beach Christain Ministries, Inc.

Surface Elevation (ft):	17.1	**Date Started:**	2/4/20
Termination Depth (ft):	5.0	**Date Completed:**	2/4/20
Proposed Location:	SWM	**Logged by:**	B. Hertzig
Excavation / Test Method:	Visual Observation	**Contractor:**	
		Rig Type:	

Groundwater Data	Depth (ft)	EL	Groundwater Comments
Seepage	NE	--	
Groundwater	4.8	12.3	
Seasonal High Groundwater	1.4	15.7	

DEPTH (IN)	COLOR	SOIL TEXTURE	COARSE FRAGMENTS (%)				STRUCTURE			WATER CONTENT	CONSISTENCY			BOUNDARY		ROOTS		MOTTLING			SAMPLING			COMMENTS
							Shape	Grade	Size		Resistance to Rupture	Stickiness	Plasticity	Distinctness	Topography			Quantity	Size	Contrast	Type	Depth (in)	No.	
6-17	Dark Gray (7.5YR 4/1)	SAND	GRAVEL 0	COBBLES 0	STONES 0	BOULDERS 0	STRUCTURELESS SINGLE GRAIN			MOIST	FRIABLE	NONSTICKY	NONPLASTIC	CLEAR <2.5"	WAVY	FEW (5% MAX)	VERY FINE	NONE			BAG	12	S-1	
17-36	Gray (10YR 6/1)	SAND	GRAVEL 0	COBBLES 0	STONES 0	BOULDERS 0	STRUCTURELESS SINGLE GRAIN			MOIST	FRIABLE	NONSTICKY	NONPLASTIC	CLEAR <2.5"	WAVY	FEW (5% MAX)	FINE	NONE			BAG	20	S-2	Dark Gray (10YR 4/1) Along rest of channels
36-45	Black (7.5YR 2.5/1)	SAND	GRAVEL 0	COBBLES 0	STONES 0	BOULDERS 0	STRUCTURELESS SINGLE GRAIN			MOIST	FRIABLE	NONSTICKY	NONPLASTIC	CLEAR <2.5"	WAVY	NONE		NONE			BAG	40	S-3	Sand grains with organic matter
45-48	Dark Brown (7.5YR 3/2)	LOAM	GRAVEL 0	COBBLES 0	STONES 0	BOULDERS 0	SUBANGULAR BLOCKY	WEAK	FINE	MOIST	FIRM	NONSTICKY	NONPLASTIC	CLEAR <2.5"	WAVY	NONE		FEW 2%	FINE <5MM	FAINT	BAG	46	S-4	Dark Reddish Brown (5YR 4/3 mottling)
48-58	Black (5YR 2.5/1)	SAND	GRAVEL 0	COBBLES 0	STONES 0	BOULDERS 0	STRUCTURELESS SINGLE GRAIN			MOIST	FRIABLE	NONSTICKY	NONPLASTIC	CLEAR <2.5"	WAVY	NONE		FEW 2%	FINE <5MM	FAINT	BAG	52	S-5	Very Dark Brown (10YR 4/3 mottling)
58-60	Yellowish Brown (10YR 5/4)	SAND	GRAVEL 0	COBBLES 0	STONES 0	BOULDERS 0	STRUCTURELESS SINGLE GRAIN			WET	FRIABLE	NONSTICKY	NONPLASTIC		WAVY	NONE		NONE			BAG	58	S-6	

Additional Remarks: 0-6" Topsoil. Possible Hardpan between 45-48" below the ground surface. Hand Probe P-1 was terminated approximately 60" below the ground surface.

DYNAMIC EARTH

SOIL PROFILE PIT LOG

Soil Profile Pit: P-2

Project: Proposed Charter School
Project No.: 3346-99-001EC
Location: 52nd Court North, West Palm Beach, Palm Beach County, Florida
Client: Palm Beach Christain Ministries, Inc.

Surface Elevation (ft):	16.8	**Date Started:**	2/4/20
Termination Depth (ft):	5.0	**Date Completed:**	2/4/20
Proposed Location:	SWM	**Logged by:**	B. Hertzig
Excavation / Test Method:	Visual Observation	**Contractor:**	
		Rig Type:	

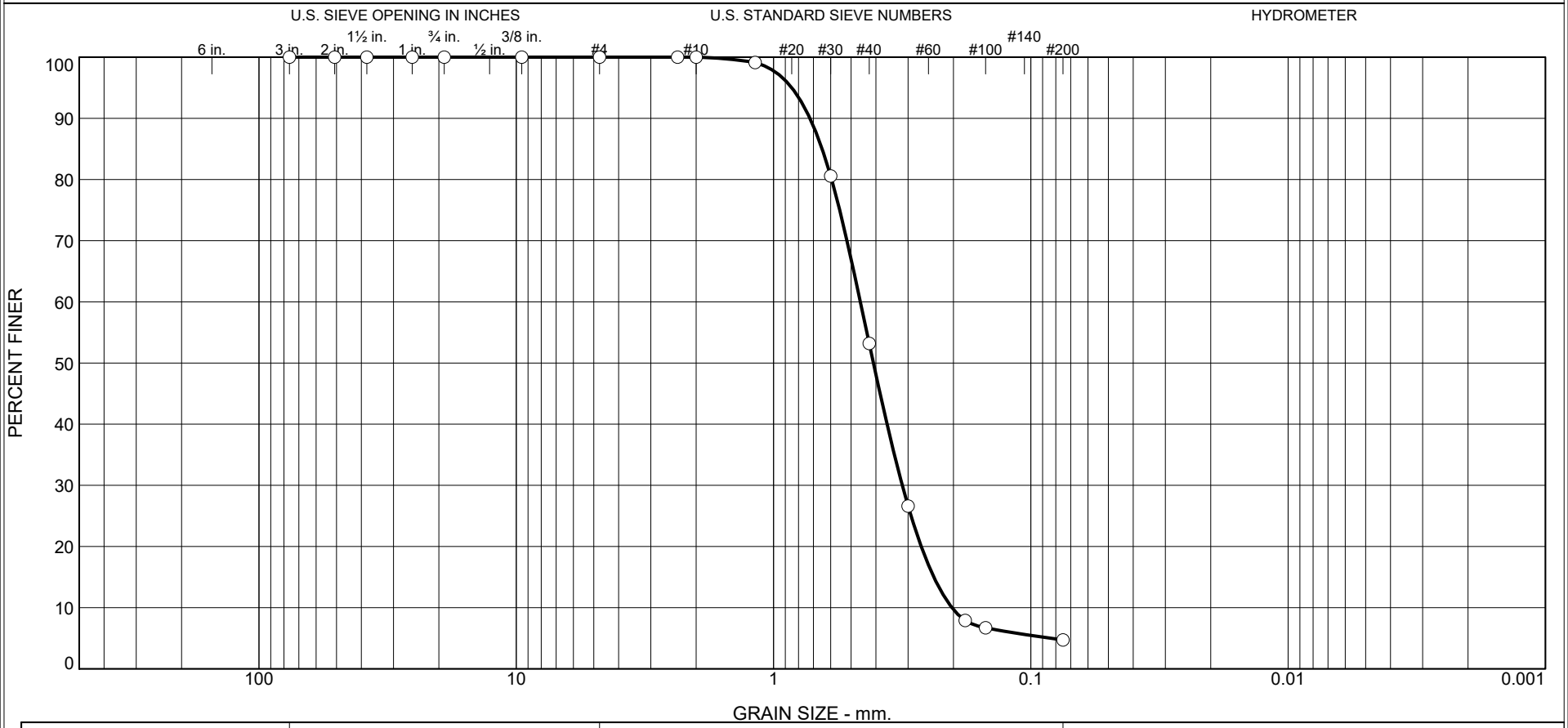
Groundwater Data	Depth (ft)	EL (msl)
Seepage	NE	--
Groundwater	4.8	12.0
Seasonal High Groundwater	2.2	14.6

Groundwater Comments

DEPTH (IN)	COLOR	SOIL TEXTURE	COARSE FRAGMENTS (%)				STRUCTURE			WATER CONTENT	CONSISTENCY			BOUNDARY		ROOTS		MOTTLING			SAMPLING			COMMENTS
							Shape	Grade	Size		Resistance to Rupture	Stickiness	Plasticity	Distinctness	Topography			Quantity	Size	Contrast	Type	Depth (in)	No.	
5-20	Black (10YR 2/1)	SAND	GRAVEL 2	COBBLES 0	STONES 0	BOULDERS 0	SINGLE GRAIN	STRUCTURELESS		MOIST	LOOSE	NONSTICKY	NONPLASTIC	CLEAR <2.5"	WAVY	FEW (5% MAX)	VERY FINE	NONE			BAG	16	S-1	
20-26	Dark Gray (7.5YR 4/1)	SAND	GRAVEL 0	COBBLES 0	STONES 0	BOULDERS 0	SINGLE GRAIN	STRUCTURELESS		MOIST	LOOSE	NONSTICKY	NONPLASTIC	CLEAR <2.5"	WAVY	NONE		NONE			BAG	22	S-2	
26-49	Black (7.5YR 2.5/1)	SAND	GRAVEL 0	COBBLES 0	STONES 0	BOULDERS 0	SINGLE GRAIN	STRUCTURELESS		MOIST	LOOSE	NONSTICKY	NONPLASTIC	CLEAR <2.5"	WAVY	NONE		NONE			BAG	44	S-3	Sand grains coated with organic matter
49-58	Yellowish Brown (10YR 5/4)	SAND	GRAVEL 0	COBBLES 0	STONES 0	BOULDERS 0	SINGLE GRAIN	STRUCTURELESS		MOIST	LOOSE	NONSTICKY	NONPLASTIC	CLEAR <2.5"	WAVY	NONE		FEW 2%	FINE <5MM	FAINT	BAG	52	S-4	Very Dark Brown (10YR 4/3 mottling)
58-60	Yellowish Brown (10YR 5/4)	SAND	GRAVEL 0	COBBLES 0	STONES 0	BOULDERS 0	SINGLE GRAIN	STRUCTURELESS		WET	LOOSE	NONSTICKY	NONPLASTIC	CLEAR <2.5"	WAVY	NONE		FEW 2%			BAG	58	S-5	

Additional Remarks: 0-5" Topsoil. Reworked soils to 20 inches including trace debris (plastic). Hand Probe P-2 was terminated approximately 60" below the ground surface.

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	46.8	48.5	4.7	

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
○	B-1	S-6	10'-12'	2/4/2020	SP	Black medium to fine sand, trace silt	19.0		NP

Client Palm Beach Christian Ministries, Inc

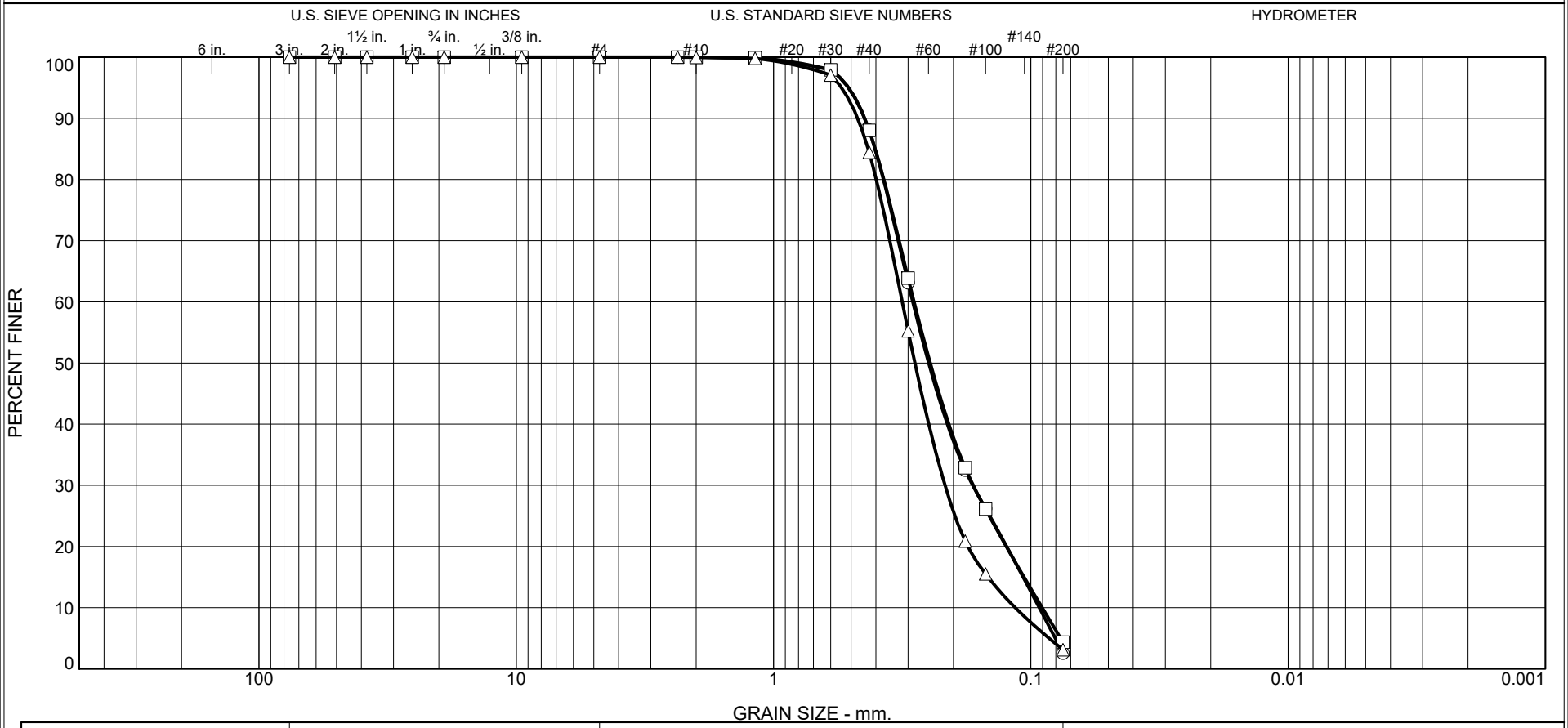
Project Proposed Charter School

5280 S. Haverhill Road, City of Green Acres, Florida

Project No. 3346-99-001E Figure 1

DYNAMIC EARTH

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	11.9	85.5	2.6	
□	0.0	0.0	0.0	0.0	12.0	83.6	4.4	
△	0.0	0.0	0.0	0.0	15.6	81.3	3.1	

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
○	B-4	S-1	0'-2'	2/4/2020	SP	Light gray medium to fine sand, trace silt, trace fine roots	6.4		NP
□	B-4	S-2	2'-4'	2/4/2020	SP	Dark brown medium to fine sand, trace silt, trace fine roots	15.2		NP
△	B-4	S-3	4'-6'	2/4/2020	SP	Light brown medium to fine sand, trace silt, trace fine roots	19.1		NP

Client Palm Beach Christian Ministries, Inc

Project Proposed Charter School

5280 S. Haverhill Road, City of Green Acres, Florida

Project No. 3346-99-001E | Figure 2

DYNAMIC EARTH

Hydraulic Conductivity Field Results

FIELD HYDRAULIC CONDUCTIVITY TEST (Screened Auger Hole -Constant Head)

Perc No.: SPT-1

Project:	Proposed Charter School			**Proj. No.:**	3346-99-001E
Location:	52nd Court North, West Palm Beach, Palm Beach County, Florida			**Client:**	Palm Beach Christian Ministries, Inc
Surface Elevation:	**Not Provided**	**Date Started:**	2/4/2020	**Logged by:**	**B. Hertzig**
Termination Depth:	**6.0**	**Date Completed:**	2/4/2020	**Contractor:**	**Geox Inc.**
Proposed Location	SWM	**Weather**	Clear	**Rig Type:**	**CME 55**

BOREHOLE GEOMETRY

Borehole Diameter (d)	1.5 Inches	Cased Hole Depth	From	0 (Feet)	6 (Feet)	
Casing Diameter	6 Inches	Perforated Casing Length		6 (Feet)		
Borehole Depth	6 Feet	Groundwater Depth Measured from Ground Surface (H_2)			4.6 (Feet)	

Depth of Borehole Below Water Table (feet) = D_S 1.4 feet

PERCOLATION TEST DATA

Flushing Period:	10 minutes	Groundwater Depth during testing	0 (Feet)

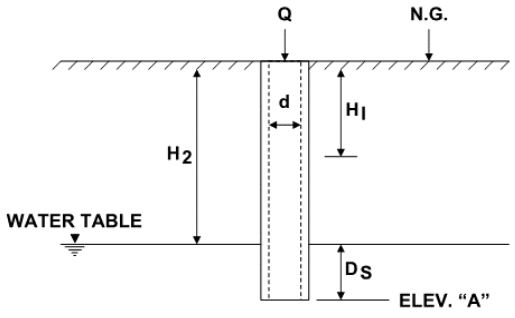
TEST RESULTS

Time (minutes)	Meter Reading			Time (minutes)	Meter Reading		
	Reading (Gallons)	Total (Gallons)	Comments		Reading (Gallons)	Total (Gallons)	Comments
Initial Reading	0	0		8	2	0	
1	0	0		9	3	1	
2	0	0		10	3	0	
3	1	1		11			
4	1	0		12			
5	1	0		13			
6	2	1		14			
7	2	0		15			

Average Flow Rate (gpm)	3.00E-01	Average Total Flow Rate (Q) (CFS)	6.68E-04

Hydraulic Conductivity (cfs/ft^2)

$$K = \frac{4Q}{\pi d (2H_2^2 + 4H_2D_S + H_2 d)}$$



Symbol	Description
Q	Steady Inflow Rate to Borehole (CFS)
d	Diameter of test hole (feet)
H_2	Total Depth of Borehole (feet)
D_S	Depth of Borehole Below Water Table (feet)
ELEV. "A"	Proposed Trench Bottom Elev.
H_1	Average Head on Unsaturated Hole Surface (FT. HEAD)
K	Hydraulic Conductivity (cfs/ft^2)

K=	9.92E-05

FIELD HYDRAULIC CONDUCTIVITY TEST (Screened Auger Hole -Constant Head)

DYNAMIC EARTH

Perc No.: SPT-2

Project:	Proposed Charter School	**Proj. No.:**	3346-99-001E
Location:	52nd Court North, West Palm Beach, Palm Beach County, Florida	**Client:**	Palm Beach Christian Ministries, Inc
Surface Elevation:	**Not Provided**	**Date Started:**	2/4/2020
Termination Depth:	**6.0**	**Date Completed:**	2/4/2020
Proposed Location	SWM	**Weather**	Clear

Logged by:	**B. Hertzig**		
Contractor:	**Geox Inc.**		
Rig Type:	**CME 55**		

BOREHOLE GEOMETRY

Borehole Diameter (d)	1.5 Inches	Cased Hole Depth	From 0 (Feet)	6 (Feet)	
Casing Diameter	6 Inches	Perforated Casing Length	6 (Feet)		
Borehole Depth	6 Feet	Groundwater Depth Measured from Ground Surface (H_2)	4.7 (Feet)		

Depth of Borehole Below Water Table (feet) = D_S 1.3 feet

PERCOLATION TEST DATA

Flushing Period:	10 minutes	Groundwater Depth during testing	0 (Feet)

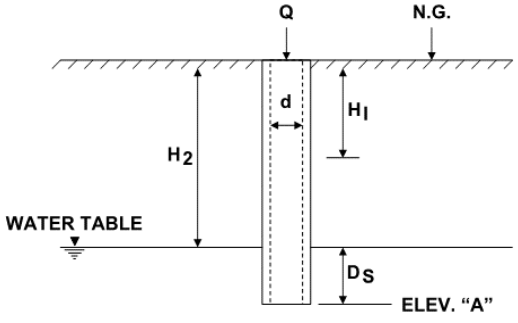
TEST RESULTS

Time (minutes)	Meter Reading			Time (minutes)	Meter Reading		
	Reading (Gallons)	Total (Gallons)	Comments		Reading (Gallons)	Total (Gallons)	Comments
Initial Reading	0	0		8	0	0	
1	0	0		9	0	0	
2	0	0		10	0	0	
3	0	0		11	0	0	
4	0	0		12	1	1	
5	0	0		13			
6	0	0		14			
7	0	0		15			

Average Flow Rate (gpm)	7.69E-02	Average Total Flow Rate (Q) (CFS)	1.71E-04

Hydraulic Conductivity (cfs/ft^2)

$$K = \frac{4Q}{\pi d (2H_2^2 + 4H_2D_S + H_2d)}$$



Symbol	Description
Q	Steady Inflow Rate to Borehole (CFS)
d	Diameter of test hole (feet)
H_2	Total Depth of Borehole (feet)
D_S	Depth of Borehole Below Water Table (feet)
ELEV. "A"	Proposed Trench Bottom Elev.
H_1	Average Head on Unsaturated Hole Surface (FT. HEAD)
K	Hydraulic Conductivity (cfs/ft^2)

K= 2.52E-05

Geotechnical Terms and Symbols

DYNAMIC EARTH

245 Main Street; Suite 110
Chester, NJ 07930
908-879-7095: Fax 908-879-0222

GEOTECHNICAL TERMS AND SYMBOLS

SAMPLE IDENTIFICATION

The Unified Soil Classification System is used to identify the soil unless otherwise noted.

SOIL PROPERTY SYMBOLS

N:	Standard Penetration Value: Blows per ft. or a 140 lb. hammer falling 30" on a 2" O.D. split-spoon.
Qu:	Unconfined compressive strength, TSF.
Qp:	Penetrometer value, unconfined compressive strength, TSF.
Mc:	Moisture content, %
LL:	Liquid limit, %
PI:	Plasiticity index, %
δd:	Natural dry density, PCF.
▼:	Apparent groundwater level at time noted after completion of boring.
=	

DRILLING AND SAMPLING SYMBOLS

NE:	Not Encountered (Groundwater was not encountered)
SS:	Split-Spoon – 1⅜" I.D., 2" O.D., except where noted
ST:	Shelby Tube – 3" O.D., except where noted
AU:	Auger Sample
OB:	Diamond Bit
CB:	Carbide Bit
WS:	Washed Sample

RELATIVE DENSITY AND CONSISTENCY CLASSIFICATION

Term (Non-Cohesive Soils)	Standard Penetration Resistance
Very Loose	0-4
Loose	4-10
Medium Dense	10-30
Dense	30-50
Very Dense	Over 50

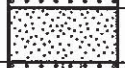
Term (Cohesive Soils)	Qu (TSF)
Very Soft	0-0.25
Soft	0.25-0.50
Firm (Medium)	0.50-1.00
Stiff	1.00-2.00
Very Stiff	2.00-4.00
Hard	4.00 +

PARTICLE SIZE

Boulders	8 in. +	Coarse Sand	5mm-0.6mm	Silt	0.074mm-0.005mm
Cobbles	8 in. – 3 in.	Medium Sand	0.6mm-0.2mm	Clay	- 0.005mm
Gravel	3 in. – 5mm	Fine Sand	0.2mm – 0.074mm		

USCS Standard Classification System

UNIFIED SOIL CLASSIFICATION SYSTEM - ASTM D2488

MAJOR DIVISION			GROUP SYMBOL	LETTER SYMBOL	GROUP NAME
COARSE GRAINED SOILS CONTAINS MORE THAN 50% FINES	**GRAVEL AND GRAVELLY SOILS** MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	GRAVEL WITH * 5% FINES		GW	Well-graded GRAVEL
				GP	Poorly graded GRAVEL
		GRAVEL WITH BETWEEN 5% AND 15% FINES		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
		GRAVEL WITH ≥ 15% FINES		GM	Silty GRAVEL
				GC	Clayey GRAVEL
	SAND AND SANDY SOILS MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE	SAND WITH * 5% FINES		SW	Well-graded SAND
				SP	Poorly graded SAND
		SAND WITH BETWEEN 5% AND 15% FINES		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
		SAND WITH ≥ 15% FINES		SM	Silty SAND
				SC	Clayey SAND
FINE GRAINED SOILS CONTAINS MORE THAN 50% FINES	SILT AND CLAY	LIQUID LIMIT LESS THAN 50		ML	Inorganic SILT with low plasticity
				CL	Lean inorganic CLAY with low plasticity
				OL	Organic SILT with low plasticity
		LIQUID LIMIT GREATER THAN 50		MH	Elastic inorganic SILT with moderate to high plasticity
				CH	Fat inorganic CLAY with moderate to high plasticity
				OH	Organic SILT or CLAY with moderate to high plasticity
HIGHLY ORGANIC SOILS				PT	PEAT soils with high organic contents

NOTES:

1) Sample descriptions are based on visual field and laboratory observations using classification methods of ASTM D2488. Where laboratory data are available, classifications are in accordance with ASTM D2487.

2) Solid lines between soil descriptions indicate change in interpreted geologic unit. Dashed lines indicate stratigraphic change within the unit.

3) Fines are material passing the U.S. Std. #200 Sieve.