TOWN OF
GREENWICH

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Town Hall • 101 Field Point Road • Greenwich, CT 06830

March 1, 2016

**** ADDENDUM #2 ****

TOWN OF GREENWICH, CT

REQUEST FOR BID #7206 NEW DEADLINE: 3/24/16 at 3:00 PM

BYRAM PARK POOL REPLACEMENT PROJECT

IMPORTANT NOTICES TO BIDDERS:

1. Information has been received by the Town that will affect a portion of design drawings being bid. The items of concern have been identified in this Addendum and the Town is planning to issue new drawings for those items in a future addendum. To allow enough time for bidders to consider those revisions, the Town is extending the bidding deadline to **March 24, 2016, at 3:00 PM.**

2. A recent review of the pool project by the Connecticut Department of Health has caused the cross sectional design of the pool gutters to be altered. New drawings reflecting this change is expected to be released in a future addendum by the Town during the week of March 7, 2016.

3. The Town is directing an increase in the bottom thickness of the pool shell from 8" to 12" with an additional layer of reinforcement. New drawings reflecting this change is expected to be released by the Town in a future addendum during the week of March 7, 2016.

4. To avoid rock ledge, the location of the sewer pump station and electric transformer pads are going to be reversed. New drawings reflecting this change is expected to be released by the Town in a future addendum during the week of March 7, 2016.

Question 1: Per General Specifications page 105, regarding Pool contractor qualifications #5 "Must have constructed a minimum of 5 municipal/state pools; 2 of which must have been completed in the last 4 years." Please clarify if modification, alteration, or repair to existing pool will count?

Answer 1: Only construction of new pools will apply.

Question #2: Within Section 02300 Earthwork Specification on page 1 reference is made to Section 00320 Subsurface Data however within the specifications there is no section 00320 Subsurface Data please advise a project this magnitude without subsurface data as to existing topsoil depth(s), existing aggregate depths, excavating and handling rock encountered without a subsurface data report would make bidding the project difficult at best.

Answer #2: A copy of the Specification Section 00320 and Geotechnical Engineering Report are attached to this Addendum.

Question #3: Table of contents under Division 6 shows section 16140 Water Devices but we couldn't find the spec in the manual. Please provide missing specification 16140.

Answer #3: On the Table of Contents, Division 16 Section 16140 "Water Devices" should be replaced with "Wiring Devices" and is included in the technical specification.

Question #4: On Drawing E3.02, Is the wiring shown along the walls in PVC conduit or something else? If its conduit, is it surface mounted or in the walls in conduit?

Answer #4: The outlets on walls in the kitchen are to follow the electrical specification for wiring and conduit. These outlets are located within the walls. The location of the kitchen is above the flood elevation.

Question #5: On Drawing E3.02, What are the receptacles in the center of the Kitchen?

Answer #5: The receptacles in the center of the room are ceiling mounted.

Question #6: Are the transformers copper or aluminum wired?

Answer #6: Copper

Question #7: Are contractors responsible for the costs from the various utility companies for initiating a service?

Answer #7: No, Those costs will be paid for by the Town directly. The contractor's responsibly is only to coordinate the utility service installation.

All other terms and conditions remain unchanged.

James Giarraputo Latham, CPPB
Senior Buyer

JGL:am

SECTION 00320
SUBSURFACE DATA

PART I - GENERAL:

1.01 SCOPE:

A. A subsurface exploration program consisting of borings, and test pits has been performed, with reasonable care. The results of the exploration program are appended hereto and are a part of the Contract Documents. Samples of the boring materials encountered may be seen upon request during the bidding period only at the office of Weston & Sampson Engineers, Inc., 5 Centennial Drive, Peabody, Massachusetts. If Contractors deem the subsurface information insufficient, they may, after obtaining Owner's permission, carry out additional subsurface explorations, at no expense to the Owner.

B. Subsurface information provided in the Contract Documents is limited by the methods used for obtaining and expressing such data, and is subject to various interpretations. The terms used to describe soils, rock, groundwater and such other conditions are subject to local usage and individual interpretation.

C. Borings have been drilled substantially at the locations indicated on the drawings and advanced to the depths shown on the logs. Soil information presented in the boring logs, as to classification, gradation, properties, density and consistency, is based on visual observation of recovered samples. Groundwater levels reported on the boring logs are those measured in the field at the particular location and at the time measurements were made, and do not necessarily represent permanent groundwater elevations. Groundwater elevations may be affected by temperature, rainfall, tidal fluctuation, and other factors that may not have been present at the time the measurements were made. The Contractors should be aware that groundwater level fluctuations may affect methods of construction.

D. Subsurface exploration, soil and rock data are for the general information of the Contractors. The Contractors are obligated to examine the site, review boring and test pit logs, all available information and records of explorations, investigations and other pertinent data for the site, and then based upon their own interpretations and investigations decide the character of material to be encountered and excavated, the suitability of the materials to be used for backfilling and such other purposes, the groundwater conditions, difficulties or obstacles likely to be encountered, and other conditions affecting the work. The subsurface data is accurate only at the particular locations and times the subsurface explorations were made. No other warranty either expressed or implied by the Owner, Engineer or their agents is made as to the accuracy of the subsurface information and data shown on the drawings or presented in the Contract Documents.

END OF SECTION

GEOTECHNICAL ENGINEERING REPORT

BYRAM PARK POOL REPLACEMENT
GREENWICH, CONNECTICUT

JULY 15, 2014

WSE PROJECT NO. 2130336

planning, permitting, design, construction, operation, maintenance, design/build, & equipment

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WSE Project No. 2130336

July 15, 2014

Town of Greenwich, Connecticut
C/o Joseph Perugini, P.E.
Weston & Sampson
273 Dividend Road
Rocky Hill, Connecticut 06067

Re: ***Geotechnical Engineering Report***
Byram Park Pool Replacement
Greenwich, Connecticut

Weston & Sampson is pleased to submit our Geotechnical Engineering Report for the proposed Byram Park pool replacement project in Greenwich, Connecticut. The project includes construction of a main pool, a kiddie pool, a pool deck, an approximate 2,400 SF recreation building, an approximate 420 SF pool/filter pump house, an approximately 350 LF, 6.5 to 8.5-foot tall concrete cantilever retaining wall, and new paved parking areas. This report presents a description of our services, a summary of field explorations and encountered subsurface conditions, and geotechnical recommendations for design and construction of the proposed project.

We appreciate the opportunity to be of service to you. If you have questions concerning this report or require additional information please contact us at 978-977-0110 Ext. 2312.

Very truly yours,
WESTON & SAMPSON ENGINEERS, INC.

Thomas J. Strike, P.E.
Project Engineer

Mark P. Mitsch, P.E.
Senior Associate

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Figure 1 Locus Plan
Figure 2 Exploration Location Plan

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Appendix A Test Pit Logs
Appendix B Test Boring Logs
Appendix C Laboratory Test Results

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1.0 INTRODUCTION

This report presents the results of our geotechnical engineering evaluation for the proposed Byram Park pool replacement project. The existing Byram Park pool facility is located off of Ritch Avenue West in Greenwich Connecticut. Refer to Figure 1, Locus Plan, for the approximate location of the site.

1.1 *PROJECT DESCRIPTION AND UNDERSTANDING*

Based on information provided on the Preliminary Design Plans dated February 7, 2014 and prepared by Weston & Sampson Engineers, Inc. (Weston & Sampson), we understand that the project includes construction of a main pool, a kiddy pool, a pool deck, an approximate 2,400 SF recreation building, an approximate 420 SF pool/filter pump house, an approximate 350 LF, 6.55 to 8.5-foot tall concrete cantilever retaining wall east of the main pool and recreation building, and new paved parking areas. New subsurface utilities and subsurface infiltration structures are also proposed throughout the site. The site contains existing buildings and related appurtenances that will be demolished and removed as part of the proposed project.

Structural details were not available at the time of this report, but we anticipate wall loads for the buildings will be less than 6 kips per linear foot. Building finished floor elevations and the pool deck elevation will be approximately El. 15. Considering the existing ground surface elevations in these areas, up to approximately 7 ft. of fill material will be required to elevate existing site elevations up to proposed elevations.

The existing pavement area in the south section of the site will be reshaped and reconstructed. The proposed pavement elevations will essentially match existing elevations. New pavement areas are proposed in locations currently occupied by buildings, landscaped and beach areas, and a bedrock outcrop.

The recommendations in this report are based on the above stated assumptions. We should be provided with actual project information as it becomes available and the opportunity to review and revise our recommendations as necessary.

1.2 *PURPOSE AND SCOPE*

Our geotechnical services for the project were performed in two phases. The purpose of Phase 1 was to evaluate general soil conditions, depth to bedrock, depth to groundwater, evidence of the seasonal high groundwater, and the Hydrologic Soil Group (HSG) of the subsurface soils in the proposed storm water infiltration areas using classification methodologies developed by the U.S. Natural Resources Conservation Services (NRCS).

The purpose of Phase 2 was to explore subsurface conditions in proposed pool, building, retaining wall, and pavement areas, complete geotechnical analyses, and provide geotechnical recommendations for design and construction of the proposed site. Our specific scope of services for both phases included the following items:

- Review geologic maps and available geotechnical information on subsurface conditions in the project vicinity.

- Complete a site reconnaissance to observe surface features relevant to geotechnical issues, such as surface materials, grades, and evidence of previous earthwork.

- Explore subsurface conditions in potential storm water infiltration areas by excavating nine test pits to depths up to 5 ft. below the ground surface (BGS).

- Explore subsurface conditions in the proposed building, retaining wall, pool, and pavement improvement areas by advancing twelve borings to depths up to 6.3 ft. BGS.

- Observe soil and groundwater conditions encountered in the explorations, obtain soil samples, prepare logs of the explorations, and classify the soils encountered in test pit excavations in accordance with NRCS guidelines.

- Submit select samples taken from the test pits for laboratory grain size and hydrometer analyses to confirm the NRCS classification and HSG designations of the native soil deposits.

- Provide recommendations for site preparation and earthwork including excavation considerations, fill material and compaction criteria, subgrade preparation and protection, utility trench backfill, permanent and temporary slope inclinations, and the need for subsurface drainage.

- Provide recommendations for shallow foundation design, including allowable bearing capacity, minimum foundation embedment depths, anticipated settlement, sliding coefficients, seismic design requirements, and lateral earth pressures.

- Provide recommendations for floor slab on-grade support including under-slab drainage (if needed).

- Provide recommendations for design and construction of the proposed retaining wall including lateral earth pressures, sliding coefficient, drainage, and backfill materials and compaction.

- Provide recommendations for the proposed pavement areas including subgrade preparation and stabilization, subbase materials and thicknesses, bituminous concrete thicknesses, and reconstruction/improvement alternatives.

- Provide a written report summarizing the results of our geotechnical evaluation.

2.0 SITE CONDITIONS

2.1 *SURFACE CONDITIONS*

Byram Park (site) is located to the south of Ritch Avenue West in Greenwich, Connecticut, as shown on Figure No. 1, Locus Plan. The site is bordered by private residences to the north and west, a yacht club to the south, and Long Island Sound to the east. The site is divided into two sections separated by a stone wall and fence. The south section currently consists of paved parking and access roads, four small wood-framed structures, and a beach area along the east side. Subsurface utilities including water, gas, drainage, and sewer are located below this section of the site. A large bedrock outcrop is located to the west and south of the existing structures. Bedrock outcrops also exist to the southwest of the parking area. According to the Preliminary Design Plans, surface grades in the south section generally slope downward from the north (El. 11) to the south (El. 7) (NAVD88). The bedrock outcrop near the existing structures has a highpoint elevation of approximately El. 18.

The north section mainly consists of a landscaped surface with a play area, a garden area, and a beach area along the east side. A bedrock slope borders the west side of the north section. The existing pool and abutting bathhouse are located in the northeast corner. There is a bedrock outcrop in the southeast corner. Subsurface water, sewer, drainage, and electric utilities are present below the north section. According to the Preliminary Design Plans, surface grades in the north section generally slope gently downward from the south (El. 10) to the north (El. 8).

2.2 *GEOLOGIC SETTING*

Surficial geology information available from the University of Connecticut's Map and Geographic Information Center (MAGIC) indicate subsurface conditions at the proposed site consist of thin till, general less than 10 to 15 ft. thick, and artificial fill over bedrock. Bedrock outcrops were observed at the site and surrounding areas. Bedrock geology at the site is mapped as Schist and Gneiss of the Hartland and Gneiss Dome belts.

2.3 *SUBSURFACE EXPLORATION PROGRAM*

2.3.1 Phase 1 Test Pits

Subsurface conditions were explored at proposed storm water infiltration areas on April 16, 2014 by excavating nine test pits (TP-1 through TP-9) to depths ranging between 1.5 and 5 ft. BGS at the approximate locations shown on ***Figure 2***. The purpose of the test pits was to evaluate general soil conditions, depth to bedrock, depth to groundwater, evidence of the seasonal high groundwater, and the HSG of the subsurface soils using classification methodologies developed by the U.S. Natural Resources Conservation Services (NRCS). The data and soil classifications generated from the test pits and presented herein will be used by others to design the storm water infiltration systems.

The test pits were performed by Beatty Construction of Sherman, CT using a John Deere 50D excavator having an operating weight of approximately 11,000 lbs. Each test pit was excavated to refusal.

A Weston & Sampson geotechnical engineer monitored the test pits in the field and prepared test pit logs. Copies of the test pit logs are included in ***Appendix A*** and contain detailed descriptions of the subsurface conditions encountered along with the NRCS classifications and HSGs of the native, inorganic soils.

The following table summarizes the NRCS classifications and HSGs of the native, inorganic soils encountered in the test pits:

Test Pit No.	NRCS Classification	HSG
TP-1	Loamy Sand	A
TP-2	Sandy Loam[1]	B[1]
TP-3	Loamy Sand[1]	A[1]
TP-4	Not Determined – Topsoil and Ash Fill over Bedrock	-
TP-5	Loamy Sand	A
TP-6	Sandy Loam[1]	B[1]
TP-7	Sandy Loam[1]	B[1]
TP-8	Not Determined – Fill over Bedrock	-
TP-9	Not Determined Fill and 6'' of Sand and Gravel over Bedrock	-

Note 1: The NRCS Classifications and HSGs of the native, inorganic soils in these test pits were confirmed with laboratory testing.

2.3.2 Phase 2 Test Borings

Subsurface conditions were explored in proposed building, pool, retaining wall, and pavement improvement areas on May 1, 2014 by advancing twelve borings (B-1 through B-12) to depths ranging between 1.7 and 6.3 ft. BGS at the approximate locations shown in ***Figure 2***. The purpose of the test borings was to explore subsurface conditions in the proposed structure and pavement areas to provide information for our geotechnical analysis.

The borings were completed by Seaboard Drilling Services of Chicopee, MA using a truck-mounted drill rig and hollow-stem auger drilling methods. Standard penetration tests (SPTs) and sampling were conducted in each boring by driving a 24 in. long by 1-3/8 in. inside diameter (2 in. outside diameter) split spoon sampler with blows from a 140 lb. safety hammer falling 30 in. per blow. Sampling intervals were generally continuous (2-ft.) until refusal was encountered.

A Weston & Sampson geotechnical engineer monitored drilling activities in the field and prepared boring logs. Copies of the boring logs are included in ***Appendix B*** and contain detailed descriptions of the subsurface conditions encountered in the exploration program.

2.4 *SUBSURFACE CONDITIONS*

2.4.1 General

Subsurface conditions encountered in our explorations generally consisted of approximately 4 to 18 inches of TOPSOIL (north site area) or approximately 3 to 5 inches of bituminous concrete pavement (south site area) overlying SUBSOIL, SAND FILL or DEBRIS FILL materials. Native SAND and GRAVEL and SILTY SAND deposits and WEATHERED BEDROCK were generally encountered below these materials. Auger, sampler, and excavator refusals were encountered at each exploration location.

Loose SUBSOIL was encountered below the topsoil at borings B-4 and B-6 and at test pits TP-1, TP-2, TP-3, TP-5, and TP-6 to depths ranging between approximately 1.5 and 3 ft. BGS. These deposits typically contained silty sand with trace gravel and was intermixed with root material.

A layer of loose to very dense SAND FILL was encountered below the topsoil or bituminous pavement at borings B-1, B-3, B-5, and B-7 through B-12 and at test pits TP-7, TP-8, and TP-9 to depths ranging between 1 and 4.5 ft. BGS. This material generally contained varying amounts of fine to coarse sand, gravel and silt; however, below the bituminous pavement, this material generally contained fine to coarse sand and gravel with trace silt and cobbles.

Very loose to medium dense DEBRIS FILL was encountered below the SAND FILL at borings B-1, B-2, and B-3 and below the topsoil at test pit TP-4. This layer was approximately 1 to 4 ft. thick and contained asphalt, coal ash, and slag fragments.

Medium dense to very dense, native SAND and GRAVEL and SILTY SAND deposits were encountered below the subsoil or sand fill at borings B-5, B-6, and B-10 and at each test pit, except TP-4 and TP-9. The SAND and GRAVEL contained little to some cobbles and trace to little silt. The SILTY SAND contained trace to some gravel and trace to little cobbles.

A layer WEATHERED BEDROCK material, approximately 0.5 to 4 ft. thick, was encountered above auger, sampler, and excavator refusals at borings B-1, B-2, B-4, B-7, and B-12 and at test pit TP-9. The composition of the weathered bedrock was similar to that of the sand and gravel deposits.

Auger or sampler refusal was encountered in all borings at depths ranging between approximately 1.7 and 6.3 ft. BGS. Sampler refusal is defined as more than 100 hammer blows for less than 1 inch of sampler penetration and auger refusal is defined as no discernible auger advancement over a period of approximately five minutes. Refusal at the boring locations may indicate the presence of densely packed cobbles, boulders, or bedrock. Coring was not completed to confirm refusal conditions.

Excavator refusal was encountered in all test pits at depths ranging between approximately 1.5 and 5 ft. BGS and appeared to be on the bedrock surface.

2.4.2 Groundwater

Groundwater was observed in borings B-1, B-3, B-7, and B-9 and in test pits TP-1, TP-3, and TP-5 at depths ranging between approximately 3 and 4 ft. BGS. Indication of season high groundwater levels in the test pits was not evident. We anticipate that groundwater levels will fluctuate with season, variations in precipitation, construction in the area, and other factors. Perched groundwater conditions could exist close to the ground surface, especially during and after extended periods of wet weather.

2.5 *LABORATORY TESTING*

Samples were obtained from the native soil deposits in test pits TP-2, TP-3, TP-6, and TP-7. Particle size distribution and USDA Textural Classification were completed on these samples by GeoTesting Express to confirm field NRCS classifications and HSG designations. Laboratory test results are included in ***Appendix C***.

3.0 GEOTECHNICAL RECOMMENDATIONS

3.1 *GENERAL*

Based on the results of our explorations and engineering analyses, proposed site development is feasible following the recommendations contained herein. Specific geotechnical recommendations are provided in the following sections.

Based on the subsurface conditions encountered in our explorations, the proposed recreation and pool/filter pump house buildings, the pool deck, and the concrete cantilever retaining wall can be supported on conventional shallow foundations bearing in undisturbed native sand and gravel and/or silty sand deposits or on properly constructed structural fill placed after removing all fill soils overlying the native sand deposits or sound, intact bedrock. Recommendations for design of shallow foundations are provided in the ***Shallow Foundations*** section of this report.

The borings and test pits performed in the proposed building, pool, and retaining wall areas (north section of the site) encountered between approximately 0.5 and 3 ft. of organic topsoil and subsoil deposits. Undocumented fill material was encountered below the topsoil at each test boring location except borings B-4 and B-6 and at test pit TP-4 and TP-7. The undocumented fill at borings B-1, B-2, B-3, and B-7 and at test pit TP-4 contained debris materials such as ash, slag, and asphalt.

The topsoil and subsoil deposits and undocumented fill material are not suitable for support of building, pool deck, and retaining wall foundations, slabs, pools, raise-in-grade fill, and other structural site improvements and should be removed below these areas to expose firm, undisturbed native sand and gravel and silty sand deposits and/or the bedrock surface. The unsuitable materials should be removed from the entire zone-of-influence beneath footings and other rigid site improvements. The zone-of-influence is defined as planes extending horizontally away from the outside edges of all foundations for 2 ft. and then down and away at a 1H:1V

slope. The excavations should be backfilled with structural fill placed in lifts and compacted to densities as recommended in this report to support conventional shallow spread footings, pools, and other structural site improvements.

The borings and the test pits performed in the existing pavement areas (south section of the site) encountered between approximately 1 and 4.5 ft. of undocumented fill material above native sand and gravel deposits and the bedrock surface. The bituminous pavement surface was measured to be approximately 3 to 5 in. thick at the exploration locations. The undocumented fill can remain in-place below proposed pavement areas provided that it does not contain organic matter, debris, or other deleterious materials and that it is compacted as recommended in the following sections.

Four, wood-framed structures exist in the north and northeast sections of the proposed expanded pavement areas of the south section. The superstructures and slabs should be removed below the new pavement areas. Footings and stem walls can remain in-place below the new pavement areas provided that the tops of these elements are cut off at least 2 ft. below the bituminous pavement surface.

Foundations (and other structural features) adjacent to soil slopes and retaining walls should be setback or stepped down such that the outside edge of the foundation is below a plane extending upward behind the toe of slope or back face of the wall at an inclination of 2H:1V. Slopes adjacent to foundations should be erosion protected immediately following construction.

3.2 *EARTHWORK*

3.2.1 Site Preparation

Prior to earthwork construction, the site should be prepared by removing all vegetation, and existing structures from the proposed building, retaining wall, pool, pool deck, pavement, and structural improvement areas and from within the zone-of-influence below proposed foundations, rigid structures, and utilities. Existing utilities should be removed below the proposed building, retaining wall, and pool areas and can remain in-place below the new pavement areas provided they do no conflict with construction. Manhole structures in new pavement areas to be abandoned should be filled with compacted structural fill material or low slump concrete and the tops removed to at least 2 ft. below the bituminous pavement surface.

Topsoil and subsoil deposits, undocumented fill, and existing foundations should be removed below foundations, slabs, pools, and other structural site improvements and their zone-of-influence as recommended above. The removal of these materials should extend at least 5 ft. beyond the perimeters of all foundations and pavement edges. Inorganic, undocumented fill material and existing foundations can remain in-place below the new pavement areas as discussed above.

3.2.2 Excavation Considerations

Refusal conditions encountered in our explorations likely indicate the presence of densely compacted cobbles, boulders, and/or bedrock. Difficult excavation and the need for large equipment with rock teeth, hydraulic hammers, and blasting should be anticipated if foundation, utility, and/or pavement area excavations exceed the refusal depths encountered in our explorations. Based on our test pits and observation of bedrock outcrops, bedrock is located at relatively shallow depths throughout the site. Bedrock should be removed to at least 1-foot below all footing, slab, pool, and utility subgrades. Bedrock should be removed to at least 2 ft. below the bituminous pavement surface to provide adequate drainage in the pavement base course layer. If blasting is required to facilitate the removal of bedrock, all loose and fragmented bedrock should be completely removed to expose the competent bedrock surface. All blasting should be performed in accordance with Local, State and Federal regulations.

Excavation will be required for site preparation, unsuitable material removal, grading, foundation construction, utility construction, etc. Temporary excavation support will likely be required for excavation depths greater than 4 feet and where seepage is present. Excavation adjacent to existing structures, foundations, site features, utilities, property lines, slopes, etc. will require excavation support and/or minimum setbacks. We should be contacted to provide specific recommendations during final design and construction if these conditions exist.

We recommend that the type and design of the shoring system be the responsibility of the contractor, who is in the best position to choose a system that fits the overall plan of operation. All excavations should be made in accordance with applicable OSHA and local safety regulations.

Groundwater was observed at borings B-1, B-3, B-7, and B-9 and in test pits TP-1, TP-3, and TP-5 at depths ranging between approximately 3 and 4 ft. BGS and may be encountered during removal and replacement of unsuitable soils and during new utility excavations. Dewatering will be necessary if groundwater is encountered during excavations. Flow rates for dewatering are likely to vary depending on location, tides, and the season during which the excavation occurs. The dewatering system should be capable of adapting to variable flows. Perched and/or surface water should be controlled during construction and prevented from eroding slopes and disturbing excavation and subgrade materials. Similar to excavation support, the dewatering system should be the responsibility of the contractor, who is in the best position to choose a system that fits the overall plan of operation.

3.2.3 Subgrade Preparation and Protection

After stripping and site preparation, the native sand and gravel and silty sand subgrades and the inorganic undocumented fill (pavement areas only) subgrade should be proof compacted with at least 6 perpendicular passes of a 10-ton vibrator roller, or equivalent effort under the observation of a geotechnical engineer from Weston & Sampson. The proof compaction should extend at least 5 ft. beyond the foundation perimeters and pavement edges. Footing subgrades and other areas with limited access should be proof compacted with a minimum of 6 passes of a 700-pound vibratory plate compactor.

Soft or disturbed areas will require over-excavation and backfilling with structural fill that is compacted as described in the following sections. Crushed stone could be used for backfilling provided that it is separated from surrounding soils by a non-woven geotextile filter fabric similar to Mirafi 180N. A woven geosynthetic stabilization fabric may also be required depending on the condition of the exposed subgrade. The recommended stabilization fabric is a woven geosynthetic with an AOS of #70 to # 100 sieve, and a minimum puncture resistance of 120 pounds (such as an AMOCO ProPex 2019 or approved equivalent).

It may be possible to scarify and recompact subgrades of loose inorganic granular soils if construction is completed during suitable conditions. The exposed surface should be scarified to a minimum depth of 12 inches and re-compacted to 95 percent relative to ASTM D1557 (modified proctor) prior to placing overlying materials. Moisture conditioning of the subgrade materials may be necessary to achieve the required compaction and may not be possible during wet or colder weather conditions.

Soils containing more than trace amounts of silt, such as the native silty sand deposits, are susceptible to softening and disturbance by construction activity during wet or freezing weather. Subgrade protection is the responsibility of the contractor and special precautions and protective measures appropriate for the weather conditions during construction should be used during earthwork and foundation construction to preserve the integrity of subgrades. Construction traffic should not operate directly on subgrades.

We recommend that a few inches of crushed stone be placed and compacted at the bases of footing and pool excavations to protect subgrades from disturbance during construction, particularly if footing/pool construction occurs during wet weather conditions. Wet and unstable subgrades will require removal and replacement with structural fill material. If footing/pool construction occurs during freezing conditions, insulating blankets, heaters, or other suitable measured should be employed to prevent foundation subgrades from freezing until the foundations are backfilled sufficiently to prevent frost from reaching the footing/pool subgrades. Protection of subgrades is the responsibility of the Contractor.

3.2.4 Trenches

Utility trench excavations should be completed as recommended above. Pipe bedding should be installed in accordance with the pipe manufacturers' recommendations. If groundwater seepage or standing water is present in the base of utility trench excavations, we recommend over-excavating the trench by 12 to 18 inches and placing trench stabilization material in the base. Trench stabilization material should consist of properly compacted, well-graded, gravel with a maximum particle size of 3 inches and free of deleterious materials. The percent passing the U.S. Standard No. 200 Sieve should be less than 8 percent by weight when tested in accordance with ASTM C 117. Crushed stone fully encapsulated by the non-woven geotextile fabric described above could be used in lieu of compacted gravel.

Trench backfill above the pipe zone should consist of well graded sand and gravel fill with no more than 8 percent passing a #200 sieve. Trench backfill should be compacted to 92 percent relative to ASTM D1557 and to 95 percent of maximum dry density as determined by ASTM

D1557 within 2 feet of finished grades. Construction of overlying hard surfaces, such as sidewalks or pavement, should not occur until at least two weeks after backfilling.

3.2.5 Structural Fill

Fill consisting of imported granular sand and gravel or angular crushed stone with less than approximately 8 percent fines is recommended below proposed building, pool and pool deck, and retaining wall areas, as backfill around footings, to elevate pavement areas up to the proposed subbase elevations, and during wet conditions. This material should be placed in lifts no greater than 10 inches (uncompacted thickness) and be compacted to at least 95 percent relative to ASTM D1557.

On-site, well-graded soils containing less than approximately 8 percent fines, having a maximum particle size of 3 inches, and free of organic and deleterious materials can be used as structural fill if properly moisture conditioned. The moisture content should be within 3 percent of optimum and the material should be compacted to at least 95 percent relative to ASTM D1557 (modified proctor). Fill should be placed in lifts no greater than 10 inches in loose (uncompacted) thickness.

3.2.6 Slopes

Soil slopes should be excavated with a smooth excavator bucket and the surface repaired if disturbed. Surface runoff should be routed so that it does not run down the face of the slopes. Erosion control is critical to maintaining slopes and should be in place immediately after construction. All slopes and excavations should be constructed in accordance with applicable OSHA and local safety standards.

Temporary slopes up to 15 feet high can be inclined up to 1.5H:1V provided no seepage or sloughing is present. Equipment should not be allowed to induce vibration or infiltrate water above the slopes and no surcharges should be located within ten feet of slope crests. Temporary slopes should be expected to ravel somewhat, depending on weather conditions, soil conditions, seepage, and duration of exposure. Soft or loose fill soils and the presence of seepage may require flatter slopes, erosion control measures, drainage elements, and/or temporary excavation support.

Permanent slopes should be formed at 3H:1V or flatter. The face of fill slopes should be overbuilt and cut back into compacted materials with a smooth excavator bucket. If steeper fill slopes are desired, we should be consulted to evaluate use of grid reinforcement, rock blankets, or rock fill buttresses.

Slopes should be protected from erosion immediately following construction using a suitably revegetated reinforced erosion control blanket (such as North American Green SC150 or equivalent). Seepage, or the presence of soft or loose sandy soils may require improved erosion control measures, including drainage elements, crushed stone blankets, and/or flatter slopes, and we should be consulted.

Site improvements, including foundations adjacent to permanent slopes should be setback such that the outside edge of the foundation or feature is a minimum of 5 feet horizontally from the crest of the slope. Slopes adjacent to foundations should be protected from erosion immediately as recommended above.

3.3 *SHALLOW FOUNDATIONS*

Based on the subsurface conditions encountered in our explorations, the proposed recreation and pump/filter buildings, the concrete cantilever retaining wall, and the pool deck, with the previously stated structural loads, can be supported by shallow spread footings bearing on proof compacted subgrades of medium dense (or dense) native sand and gravel and/or silty sand deposits or on structural fill placed over these deposits or the intact bedrock surface after all topsoil, existing fill or other deleterious materials have been removed. The pools should be similarly supported. We should be contacted to observe all foundation subgrades prior to placement of fill material, forms, and rebar.

Foundations for the proposed building should be designed in accordance with the provisions of the current edition of the Connecticut State Building Code. Footings should be embedded at least 3.5 ft. below the nearest proposed adjacent ground surface exposed to freezing. If the buildings will be heated, interior footing embedment may be reduced to a minimum of 18 inches below the lowest overlying floor slab elevation. Note that these footings will likely require special frost protection measures during construction if installed during freezing conditions.

Footings bearing on the native medium dense or denser sand and gravel and/or silty sand deposits or on properly constructed structural fill can be designed using an allowable bearing pressure of 5,000 psf. The bearing pressure can be increased to 7,500 psf for temporary wind and seismic loads provided load eccentricities are within the middle third of the footing. Resistance to lateral loads can be obtained by a passive equivalent fluid pressure of 350 pcf, ignoring the top 12 inches of embedment, and by a footing base friction coefficient of 0.45.

Shallow foundations constructed as recommended herein are anticipated to undergo total and differential settlements of less than 1-inch and ½-inch, respectively. The majority of building foundation settlement is expected to occur during construction.

3.4 *SLABS*

Slabs-on-grade with loads up to 250 psf constructed on properly prepared subgrades are expected to induce less than one inch of total settlement. A minimum of six inches of clean, angular, 1-1/2 inch crushed stone is recommended for directly under the slabs. We should be contacted to evaluate the subgrade prior to placement of the slab rock. The crushed stone should be compacted with a heavy vibratory roller compactor prior to slab construction. The stone layer thickness may need to be increased based on prevailing weather conditions during construction. Accumulated water, snow, or ice will need to be removed from the crushed stone prior to slab construction.

Some flooring manufacturers require specific slab moisture levels and/or vapor barriers to validate the warranties on their products. A properly installed and protected vapor flow retardant can reduce slab moistures. If a vapor flow retardant is used, care should be taken not to trap moisture within the overlying granular fill and floor slab concrete.

3.5 *SEISMIC DESIGN*

3.5.1 Site Class

In accordance with the International Building Code (IBC) as adapted by the State of Connecticut State Building Code and based on our explorations and analyses, the subject project can be evaluated using parameters associated with a Site Class C.

3.5.2 Liquefaction Potential

Liquefaction can occur in loose, saturated, granular soils. Strong shaking, such as that experienced during earthquakes, can cause a sudden loss of shear strength, densification, and subsequent settlement of these soils. Based on soil and groundwater conditions observed in our explorations, the risk of structurally damaging ground deformations is low.

3.6 *RETAINING STRUCTURES*

3.6.1 General

The following recommendations are based on the assumptions that: (1) Walls consist of concrete cantilevered retaining or embedded building walls, (2) Wall backfill consists of free draining, angular, granular material, and (3) Walls are less than 15 feet in total height (10 ft. exposed). Wall drain recommendations are provided in ***Section 3.7 - Drainage*** of this report.

3.6.2 Lateral Earth Pressures

Lateral earth pressures on retaining walls unrestrained from rotation with level backfill and drainage provided behind the wall (as recommended Section 3.7) should be calculated using an equivalent fluid unit weight of 40 pcf. This unit weight should be increased to 60 pcf for walls that are restrained from rotation such as embedded building walls or walls connected to structures such as backfilled stem walls supporting floor slabs. For sloping backfill up to 3H:1V, the equivalent fluid unit weights should be increased to 65 pcf for walls unrestrained from rotation and to 95 pcf for walls restrained from rotation.

A uniform lateral pressure of 150 pounds per square foot (psf) should be added to the above pressures and applied over the full backfill height of all walls. The 150 psf lateral pressure is intended to account for vertical surcharge pressures at the tops of walls up to 300 psf. Additional lateral pressures equal to 0.5 times the additional surcharge pressure should be added to walls where surcharge pressures exceed 300 psf.

Driving forces can be resisted by passive pressure at the toe of the wall using an equivalent fluid pressure of 350 pcf (this should exclude the top 12 inches of embedment) and friction along the base using a friction coefficient of 0.45. Footings for retaining walls should be designed as recommended in ***Section 3.4 – Shallow Foundations*** of this report.

Footings, floor slabs, and other improvements located above and behind retaining walls (including footings for upper walls in tiered retaining wall configurations) and within a zone defined by a plane extending upward at 1H:1V from the back of the bottom of the wall will increase lateral pressures on the wall. We should be consulted if footings or surcharges are located within this zone.

3.6.3 Backfill

Retaining walls should be backfilled with clean, imported, granular soil with less than 6 percent fines, such as clean sand and gravel. This material should be compacted to a minimum of 92 percent relative to ASTM D-1557 (modified proctor). Within 3 feet of the wall, backfill should be compacted to not more than 90 percent relative to ASTM D-1557 using hand-operated equipment.

Retaining structures typically rotate and displace up to 1 percent of the wall height during development of active pressures behind the wall. We therefore recommend that construction of improvements adjacent to the top of walls be delayed until approximately two weeks after wall construction and backfill.

3.7 *DRAINAGE*

3.7.1 General

Exterior ground surfaces should be sloped to drain away from the structures. Drainage elements such as catch basins or strip drains should provide drainage if sloping is not possible. Gutters and drains should be tight-lined to a suitable erosion protected discharge and maintained as free-flowing. Cleanouts and redundant drain pipes are recommended.

3.7.2 Retaining Wall Drains

Wall drains should consist of a two-foot wide zone of ¾-inch washed crushed stone surrounding a 4-inch diameter perforated pipe and encased with a non-woven filter fabric. The crushed stone should have no more than 2 percent passing a #200 sieve and should extend to within one foot of the ground surface. The geosynthetic should have an AOS of a #70 sieve, a minimum permittivity of 1.0 sec^{-1}, and a minimum puncture resistance of 80 pounds (such as an AMOCO ProPex 4551 or equivalent). The perforated drain pipe should be installed at the footing elevation and routed to suitable, erosion protected discharge locations.

3.8 *ROCK SLOPE CONSIDERATIONS*

A rock slope is located along the west side of the north section of the site and according to the Preliminary Design Plans, removal of a portion of this slope will be required to allow construction of the pool deck and kiddie pools. It is recommended that a Professional Geologist inspect the rock slope to assess overall stability of the slope and to map joint patterns and loose and weathered zones. Based on the rock slope assessment, removal of loose and weathered zones and stabilization of the slope face may be required.

As indicated on the Preliminary Design Plans, drainage should be provided at the base of the rock slope to direct runoff away from the pool deck.

3.9 *ASPHALT CONCRETE PAVEMENT*

3.9.1 General

Site improvements will include new asphalt concrete (bituminous) driveway and parking areas in the general vicinity of existing pavement areas. Proposed grades are generally within 6 inches of existing pavement grades. Explorations in the existing pavement areas generally encountered 3 to 5 in. of asphalt pavement underlain by at least 9 inches of base course material, which generally consisted of medium dense to very dense sand and gravel fill with trace silt.

Our pavement recommendations are based on the assumption that construction will be completed during an extended period of dry weather and that pavement subgrades will consist of medium dense (or denser) undisturbed granular fill, native sand, gravel, or silty sand deposits. At the time of this report we did not have specific information regarding the type and frequency of expected traffic; however, it is assumed that the pavement will be subjected to light traffic volume from passenger vehicles and occasional trucks such as landscape and garbage collection vehicles.

3.9.2 Subgrade Preparation

Subgrades should prepared in accordance with the recommendations provided in the ***Earthwork*** section of this report. Subgrades of exiting granular material should be scarified and compacted to a minimum of 95 percent of the materials maximum dry density as determined by ASTM Specification D-1557. In addition to density requirements, the prepared subgrade should be proofrolled using a fully loaded 10-wheeled dump truck. We should be contacted to observe proofrolling and identify soft, disturbed, or yielding materials. Unsuitable areas should be repaired by additional scarification and recompaction or by over-excavation and replacement with structural fill. If a stabilization geosynthetic is required, we recommend a woven geosynthetic with an AOS of #70 to #100 sieve, and a minimum puncture resistance of 120 pounds (such as an AMOCO ProPex 2019 or equivalent).

3.9.3 Recommended Pavement Section

The new pavement section may be constructed of imported materials, reclaimed granular base materials from beneath existing pavements, recycled processed demolition materials, or a mixture of these materials provided they meet the following material specifications. In-place pulverization of existing asphalt and mixing with existing base materials may be result in an acceptable subbase material.

Granular fill, subbase, and granular pavement base materials should conform to Sections M.02 and M.05 of the ConnDOT Materials Specifications and be prepared in accordance with Sections 2.02, 3.04, 2.12, 2.14 and 3.02 of the ConnDOT Standard Specifications. Asphalt concrete materials should conform to Section M.04 of the ConnDOT Materials Specifications and be prepared in accordance with Section 4.06 ConnDOT Standard Specifications. Bituminous concrete materials should be compacted to a minimum of 92 percent of Rice Density (maximum theoretical density).

The following pavement section will provide adequate support of the assumed traffic loads and is intended to be the minimum acceptable for construction during a period of dry weather. Increased aggregate thicknesses will be required for construction during wet conditions and/or to provide additional frost protection as described in the following section.

Layer Description	Layer Thickness
Bituminous Wearing Course	1.5
Bituminous Binder Course	2.0
Granular Base (M.02.03)*	4.0
Subbase (M.02.02)*	6.0

* - See Frost Protection section below.

3.9.4 Frost Protection

Pavement structures are susceptible to frost (i.e. freeze-thaw cycles), which generally result in reduced pavement life and increased maintenance costs. We generally recommend a minimum total pavement structure thickness (AC + Base Aggregate) of 19 inches to provide some degree of frost protection. This minimum thickness is intended to reduce, not prevent frost damage.

The above pavement section has a total thickness of 13.5 inches. Depending on available funds, the City may consider increasing the pavement sections to increase frost protection in these areas. This can be accomplished by increasing the thickness of the Granular Base or Subbase layer thicknesses.

4.0 LIMITATIONS

4.1 *OBSERVATION OF CONSTRUCTION*

Satisfactory earthwork and foundation performance depends to a large degree on the quality of construction. Subsurface conditions observed during construction should be compared with those encountered during the subsurface explorations. Recognition of changed conditions often requires experience; therefore, qualified personnel should visit the site with sufficient frequency to detect whether subsurface conditions change significantly from those anticipated. In addition, sufficient monitoring of the contractor's activities is a key part of determining that the work is completed in accordance with the construction drawings and specifications.

4.2 *VARIATIONS OF SUBSURFACE CONDITIONS AND USE OF REPORT*

We have prepared this report for use by the Town of Greenwich, Connecticut and members of the design and construction team for the subject project and sites, only. The data and report can be used for estimating purposes, but our report, conclusions, and interpretations should not be construed as a warranty of the subsurface conditions and are not applicable to other sites.

Soil borings and test pits indicate soil conditions only at specific locations and only to the depths penetrated. They do not necessarily reflect subsurface conditions that may exist between exploration locations. If subsurface conditions differing from those described are noted during the course of excavation and construction, reevaluation will be necessary.

Site development plans and design details were considered preliminary at the time this report was prepared. If changes are made in site grades, configuration, design loads, or type of construction for the structure, the conclusions and recommendations may not be applicable. If design changes are made, we should be retained to review our conclusions and recommendations and provide a written evaluation or modification. Additional geotechnical engineering analyses and explorations may be necessary for final design.

Within the limitations of scope, schedule, and budget, our services have been executed in accordance with generally accepted practices in this area at the time this report was prepared. No warranty or other conditions, expressed or implied, are given

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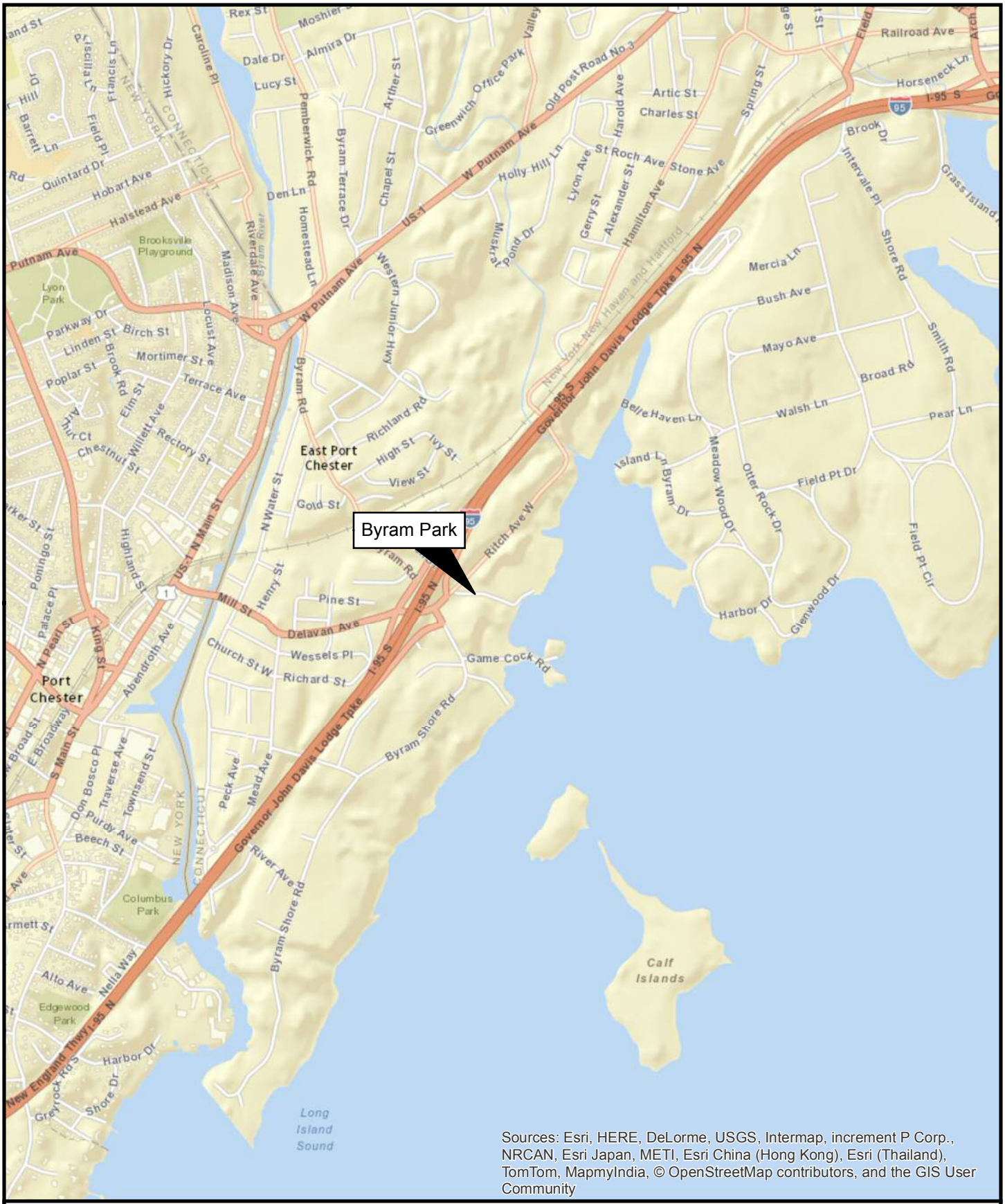
FIGURES



Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

Figure 1 - Locus Plan

Byram Park Pool Replacement
Greenwich, CT
41°00'16.5"N 73°38'45.5"W

1,000 0 1,000
Scale In Feet

N

Weston & Sampson

Path: \\gisdatasrv\gis\DataStore\Client\Greenwich CT\Byram Park Pool Replacement\LocusMap.mxd User: OzerekoZ Saved: 7/15/2014 1:57:57 PM Opened: 7/15/2014 1:59:22 PM

PROPOSED 420 SF
POOL/FILTER PUMP HOUSE

PROPOSED KIDDIE
POOL AREA

PROPOSED
MAIN POOL

PROPOSED 2,400
SF REC. BUILDING

PROPOSED 350 LF
RETAINING WALL

BEDROCK
OUTCROP

EXISTING BUILDINGS
TO BE DEMOLISHED

B-1 B-2 B-3 B-4 B-5 B-6 B-7 B-8 B-9 B-10 B-11 B-12

TP-1 TP-2 TP-3 TP-4 TP-5 TP-6 TP-7 TP-8 TP-9

0.5' ASPHALT CURBING
0.5' CURBING
0.3' STONE CURBING
0.5' /STONE CURBING
(APPROXIMATE LOCATION)
(RECORD)
8" RCP
6" VCP
4" HDPE
12" RCP
3" CIP

NOTES:

1. TEST PITS COMPLETED FOR WESTON & SAMPSON BY BEATTY CONSTRUCTION CO. OF SHERMAN, CT ON APRIL 16, 2014.
2. BORINGS COMPLETED FOR WESTON & SAMPSON BY SEABOARD DRILLING SERVICES OF CHICOPEE, MA ON MAY 28, 2014.
3. WESTON & SAMPSON OBSERVED EXPLORATION ACTIVITIES IN THE FIELD.
4. EXPLORATION LOCATIONS WERE MEASURED RELATIVE TO EXISTING SITE FEATURES. LOCATIONS SHOWN ARE APPROXIMATE.
5. THE SITE PLAN IS BASED ON A JUNE 16, 2014 PRELIMINARY SITE DESIGN PLAN PROVIDED BY WESTON & SAMPSON.

LEGEND

B-1 BORING LOCATIONS

TP-1 TEST PIT LOCATIONS

50 25 0 50 100

SCALE: 1"=50'

FIGURE - 2

GREENWICH, CT
BYRAM PARK POOL REPLACEMENT

EXPLORATION LOCATION PLAN

DESIGNED BY: PTO	CHECKED BY: TJS	DATE: JULY 2014

Weston&Sampson®

O:\Greenwich CT\Byram Park Geotech\CAD\Exploration Location Plan.dwg

APPENDIX A

Test Pit Logs

TEST PIT LOG

PROJECT NAME/NO.	Byram Park Pool Replacement - 2130336			**TEST PIT NUMBER**	
LOCATION	Greenwich, CT			TP-1	
CLIENT	Town of Greenwich			GROUND SURFACE	
CONTRACTOR	Beatty Construction	FOREMAN:	Tim Beatty	ELEVATION	10 ft. +/-
OBSERVED BY	Per Onsager	DATE	4/16/14	DEPTH TO GROUNDWATER	
CHECKED BY	Tom Strike, PE	DATE	4/22/14		3 ft. +/-

DEPTH BELOW GROUND SURFACE (ft.)	TEST PIT DIAGRAM AND SOIL DESCRIPTION	STRATUM DESCRIPTION
Surface	12" Topsoil	***TOPSOIL***
1		***1' +/-***
2	Dark, orange-brown, SILTY SAND, trace gravel, trace roots; moist.	***SUBSOIL*** **2' +/-**
3	Dark gray, fine to coarse SAND and GRAVEL, some cobbles, little silt; moist to wet. (LOAMY SAND - NRCS HYDROLOGIC SOIL GROUP (HSG) A)	***SAND AND GRAVEL***
4		
5	Excavator Refusal at 4 ft. +/-	**Bottom of test pit at 4 ft.**
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NOTES:

1. Test pit completed using a Johne Deere 50D Excavator.
2. Groundwater observed to be infiltrating rapidly through the Sand and Gravel Layer.

TEST PIT NUMBER
TP-1

planning, permitting, design, construction, operation, maintenance Weston&Sampson®

O:\Greenwich CT\Byram Park Geotech\Field\Test Pits\[Byram Park - Test Pit Logs.xls]TP-9

TEST PIT LOG

PROJECT NAME/NO.	Byram Park Pool Replacement - 2130336			**TEST PIT NUMBER**	
LOCATION	West Greenwich, CT			TP-2	
CLIENT	Town of Greenwich			GROUND SURFACE	
CONTRACTOR	Beatty Construction	FOREMAN:	Tim Beatty	ELEVATION	10.5 ft. +/-
OBSERVED BY	Per Onsager	DATE	4/16/14	DEPTH TO GROUNDWATER	
CHECKED BY	Tom Strike, PE	DATE	4/22/14		Not Observed

DEPTH BELOW GROUND SURFACE (ft.)	TEST PIT DIAGRAM AND SOIL DESCRIPTION	STRATUM DESCRIPTION
Surface	Topsoil	***TOPSOIL*** **8" +/-**
1	Dark, orange-brown, SILTY SAND, trace gravel, trace roots; moist.	***SUBSOIL*** **1.5' +/-**
2	Dark gray, SILTY SAND, little gravel, little cobbles; moist. (SANDY LOAM - NRCS HSG B)	***SILTY SAND***
3		
4	Excavator Refusal at 3.5 ft. +/-	**Bottom of test pit at 3.5 ft.**
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NOTES: **1** Test pit completed using a John Deere 50D Excavator.

TEST PIT NUMBER
TP-2

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TEST PIT LOG

PROJECT NAME/NO.	Byram Park Pool Replacement - 2130336			**TEST PIT NUMBER**	
LOCATION	Greenwich, CT			TP-3	
CLIENT	Town of Greenwich			GROUND SURFACE	
CONTRACTOR	Beatty Construction	FOREMAN:	Tim Beatty	ELEVATION	10 ft. +/-
OBSERVED BY	Per Onsager	DATE	4/16/14	DEPTH TO GROUNDWATER	
CHECKED BY	Tom Strike, PE	DATE	4/22/14		4 ft. +/-

DEPTH BELOW GROUND SURFACE (ft.)	TEST PIT DIAGRAM AND SOIL DESCRIPTION	STRATUM DESCRIPTION
Surface		
1	Topsoil	***TOPSOIL*** **10" +/-**
2	Tan, SILTY SAND, trace gravel, roots; moist.	***SUBSOIL*** **2' +/-**
3	Dark gray, fine to coarse SAND and GRAVEL, some cobbles, trace silt; moist to wet. (LOAMY SAND - NRCS HSG A)	***SAND AND GRAVEL***
4		
5	Excavator Refusal at 4 ft. +/-	**Bottom of test pit at 4 ft.**
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NOTES: **1** Test pit completed using a John Deere 50D Excavator.

TEST PIT NUMBER
TP-3

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TEST PIT LOG

PROJECT NAME/NO.	Byram Park Pool Replacement - 2130336			**TEST PIT NUMBER**	
LOCATION	Greenwich, CT			TP-4	
CLIENT	Town of Greenwich			GROUND SURFACE	
CONTRACTOR	Beatty Construction	FOREMAN:	Tim Beatty	ELEVATION	10 ft. +/-
OBSERVED BY	Per Onsager	DATE	4/16/14	DEPTH TO GROUNDWATER	
CHECKED BY	Tom Strike, PE	DATE	4/22/14		Not Observed

DEPTH BELOW GROUND SURFACE (ft.)	TEST PIT DIAGRAM AND SOIL DESCRIPTION	STRATUM DESCRIPTION
Surface	Topsoil	***TOPSOIL*** **5" +/-**
1	Black, COAL ASH FILL, slag fragments, few boulders up to approximately 1.5 ft. in diameter; moist. NRCS HSG not determined since material consists of ash fill.	***ASH FILL***
2		
3	Excavator Refusal at 2 ft. +/-	**Bottom of test pit at 2 ft.**
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NOTES: **1** Test pit completed using a John Deere 50D Excavator.

TEST PIT NUMBER
TP-4

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O:\Greenwich CT\Byram Park Geotech\Field\Test Pits\[Byram Park - Test Pit Logs.xls]TP-9

TEST PIT LOG

PROJECT NAME/NO.	Byram Park Pool Replacement - 2130336			**TEST PIT NUMBER**	
LOCATION	Greenwich, CT			TP-5	
CLIENT	Town of Greenwich			GROUND SURFACE	
CONTRACTOR	Beatty Construction	FOREMAN:	Tim Beatty	ELEVATION	9.5 ft. +/-
OBSERVED BY	Per Onsager	DATE	4/16/14	DEPTH TO GROUNDWATER	
CHECKED BY	Tom Strike, PE	DATE	4/22/14		3 ft. +/-

DEPTH BELOW GROUND SURFACE (ft.)	TEST PIT DIAGRAM AND SOIL DESCRIPTION	STRATUM DESCRIPTION
Surface		
1	Topsoil	***TOPSOIL***
		1.5' +/-
2	Dark, orange-brown, SILTY SAND, trace gravel, trace roots; moist.	***2' +/- SUBSOIL***
3	Brownish-gray, fine to coarse SAND and GRAVEL, some cobbles, little silt; moist to wet. (LOAMY SAND - NRCS HSG A)	***SAND AND GRAVEL***
4		
5	Excavator Refusal at 4.5 ft. +/-	**Bottom of test pit at 4.5 ft.**
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NOTES:
1. Test pit completed using a John Deere 50D Excavator.
2. Groundwater observed to be infiltrating rapidly through the Sand and Gravel Layer.

TEST PIT NUMBER
TP-5

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TEST PIT LOG

PROJECT NAME/NO.	Byram Park Pool Replacement - 2130336			**TEST PIT NUMBER**	
LOCATION	Greenwich, CT			TP-6	
CLIENT	Town of Greenwich			GROUND SURFACE	
CONTRACTOR	Beatty Construction	FOREMAN:	Tim Beatty	ELEVATION	8 ft. +/-
OBSERVED BY	Per Onsager	DATE	4/16/14	DEPTH TO GROUNDWATER	
CHECKED BY	Tom Strike, PE	DATE	4/22/14		Not Observed

DEPTH BELOW GROUND SURFACE (ft.)	TEST PIT DIAGRAM AND SOIL DESCRIPTION	STRATUM DESCRIPTION
Surface		
1	Topsoil	***TOPSOIL*** **1 ft. +/-**
2	Dark, orange-brown, SILTY SAND, little gravel, trace roots; moist.	***SUBSOIL***
3		**3' +/-**
4	Gray, SAND, little gravel, little cobbles, little silt; moist. (SANDY LOAM - NRCS HSG B)	**SILTY SAND**
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7	Excavator Refusal at 5 ft. +/-	**Bottom of test pit at 5 ft.**
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NOTES: **1** Test pit completed using a Johne Deere 50D Excavator.

TEST PIT NUMBER
TP-6

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O:\Greenwich CT\Byram Park Geotech\Field\Test Pits\[Byram Park - Test Pit Logs.xls]TP-9

TEST PIT LOG

PROJECT NAME/NO.	Byram Park Pool Replacement - 2130336			**TEST PIT NUMBER**	
LOCATION	Greenwich, CT			TP-7	
CLIENT	Town of Greenwich			GROUND SURFACE	
CONTRACTOR	Beatty Construction	FOREMAN:	Tim Beatty	ELEVATION	9 ft. +/-
OBSERVED BY	Per Onsager	DATE	4/16/14	DEPTH TO GROUNDWATER	
CHECKED BY	Tom Strike, PE	DATE	4/22/14		Not Observed

DEPTH BELOW GROUND SURFACE (ft.)	TEST PIT DIAGRAM AND SOIL DESCRIPTION	STRATUM DESCRIPTION
Surface		
1	Topsoil	***TOPSOIL*** **1' +/-**
2	Brown, SILTY SAND FILL, little gravel, trace cobbles; moist.	***SAND FILL*** **2.5' +/-**
3	Brownish-gray, SILTY SAND, some gravel, trace cobbles; moist. (SANDY LOAM - NRCS HSG B)	***SILTY SAND***
4		
5	Excavator Refusal at 4 ft. +/-	**Bottom of test pit at 4 ft.**
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NOTES: **1** Test pit completed using a John Deere 50D Excavator.

TEST PIT NUMBER
TP-7

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TEST PIT LOG

PROJECT NAME/NO.	Byram Park Pool Replacement - 2130336			**TEST PIT NUMBER**	
LOCATION	Greenwich, CT			TP-8	
CLIENT	Town of Greenwich			GROUND SURFACE	
CONTRACTOR	Beatty Construction	FOREMAN:	Tim Beatty	ELEVATION	7 ft. +/-
OBSERVED BY	Per Onsager	DATE	4/16/14	DEPTH TO GROUNDWATER	
CHECKED BY	Tom Strike, PE	DATE	4/22/14		Not Observed

DEPTH BELOW GROUND SURFACE (ft.)	TEST PIT DIAGRAM AND SOIL DESCRIPTION	STRATUM DESCRIPTION
Surface	3" Bituminous Pavement	***BITUMINOUS PAVEMENT***
1	Brown, fine to coarse SAND and GRAVEL FILL, trace silt; moist.	***SAND FILL***
2	Excavator Refusal at 1.5 ft. +/-	**Bottom of test pit at 1.5 ft.**
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NOTES: **1** Test pit completed using a John Deere 50D Excavator.

TEST PIT NUMBER
TP-8

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O:\Greenwich CT\Byram Park Geotech\Field\Test Pits\[Byram Park - Test Pit Logs.xls]TP-9

TEST PIT LOG

PROJECT NAME/NO.	Byram Park Pool Replacement - 2130336			**TEST PIT NUMBER**	
LOCATION	Greenwich, CT			TP-9	
CLIENT	Town of Greenwich			GROUND SURFACE	
CONTRACTOR	Beatty Construction	FOREMAN:	Tim Beatty	ELEVATION	6 ft. +/-
OBSERVED BY	Per Onsager	DATE	4/16/14	DEPTH TO GROUNDWATER	
CHECKED BY	Tom Strike, PE	DATE	4/22/14		Not Observed

DEPTH BELOW GROUND SURFACE (ft.)	TEST PIT DIAGRAM AND SOIL DESCRIPTION	STRATUM DESCRIPTION
Surface	3" Bituminous Pavement	***BITUMINOUS PAVEMENT***
1	Brown, fine to coarse, SAND FILL, some gravel, trace silt; moist.	***SAND FILL*** **1' +/-**
	Gray, fine to coarse SAND, some gravel, little silt; moist.	**1.5' +/- *SAND AND GRAVEL***
2	Weathered Bedrock	***WEATHERED BEDROCK***
3	Excavator Refusal at 2 ft. +/-	**Bottom of test pit at 2 ft.**
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		

NOTES: **1** Test pit completed using a John Deere 50D Excavator.

TEST PIT NUMBER
TP-9

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O:\Greenwich CT\Byram Park Geotech\Field\Test Pits\[Byram Park - Test Pit Logs.xls]TP-9

APPENDIX B

Test Boring Logs

planning, permitting, design, construction, operation, maintenance **Weston&Sampson**	PROJECT Byram Park Pool Replacement Greenwich, CT	REPORT OF BORING No. B-1 SHEET 1 OF 1 Project No. 2130336 CHKD BY Thomas Strike, P.E.

BORING Co.	Seaboard Drilling Services	BORING LOCATION	See Plan		
FOREMAN	Jeff Nitsch	GROUND SURFACE ELEV.	El. 10.5 +/-	DATUM	NAVD88
WSE ENGINEER:	Julie Eaton	DATE START	5/28/14	DATE END	5/28/14

SAMPLER: 2 IN. OD SPLIT SPOON SAMPLER (SPT) DRIVEN 24 INCHES USING A 140 lb. SAFETY HAMMER.

CASING: HOLLOW-STEM AUGER.

CASING SIZE: 2 1/4 in. ID OTHER: N/A

GROUNDWATER READINGS

DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME
5/28/2014	N/A	4 ft. +/-	N/A	Upon Completion

DEPTH (feet)	CASING (lb./ft.)	SAMPLE No.	REC/PEN (in)	DEPTH (ft.)	BLOWS/6"	PID (ppm)	SAMPLE DESCRIPTION	NOTES	STRATUM DESCRIPTION
0	NA	S1	14/24	0-2	2-3-10-4		8" Topsoil		*8"*
							Medium dense, brown, fine to coarse SAND FILL, some gravel, trace silt; moist.		***SAND FILL***
2		S2	12/24	2-4	3-7-11-15		Top 6": Loose, brown SILTY SAND FILL, trace gravel; moist.		*3' +/-*
							Bottom 6": Medium dense, Asphalt fragments.		***DEBRIS FILL***
4									*4' +/-*
		S3	13/24	4-6	22-19-19-15		Dense, highly WEATHERED BEDROCK; wet.	1	***WEATHERED BEDROCK***
6		S4	3/3	6-6.25	50/3"		Same as above; very dense.		
							Auger Refusal at 6.3 ft.		***Bottom of Boring at 6.3'***
8									
10									
12									
14									
16									
18									

GRANULAR SOILS		COHESIVE SOILS	
BLOWS/FT	DENSITY	BLOWS/FT	DENSITY
0-4	V. LOOSE	0-2	V. SOFT
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
> 50	V. DENSE	15-30	V. STIFF
		> 30	HARD

REMARKS:

1. Weathered Bedrock similar in consistency as sand and gravel material.

NOTES:

1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.

BORING No. B-1

planning, permitting, design, construction, operation, maintenance **Weston&Sampson®**	PROJECT Byram Park Pool Replacement Greenwich, CT	REPORT OF BORING No. B-2 SHEET 1 OF 1 Project No. 2130336 CHKD BY Thomas Strike, P.E.

BORING Co.	Seaboard Drilling Services	BORING LOCATION	See Plan		
FOREMAN	Jeff Nitsch	GROUND SURFACE ELEV.	El. 10 +/-	DATUM	NAVD88
WSE ENGINEER:	Julie Eaton	DATE START	5/28/14	DATE END	5/28/14

SAMPLER: 2 IN. OD SPLIT SPOON SAMPLER (SPT) DRIVEN 24 INCHES USING A 140 lb. SAFETY HAMMER.

CASING: HOLLOW-STEM AUGER.

CASING SIZE: 2 1/4 in. ID OTHER: N/A

GROUNDWATER READINGS

DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME
5/28/2014	N/A	Not Observed		

DEPTH (feet)	CASING (lb./ft.)	SAMPLE No.	REC/PEN (in)	DEPTH (ft.)	BLOWS/6"	PID (ppm)	SAMPLE DESCRIPTION	NOTES	STRATUM DESCRIPTION
0	NA	S1	16/24	0-2	5-8-10-9		Top 8": Medium dense, brown, SILTY SAND FILL, trace gravel; moist.		***12" SAND FILL***
							Bottom 8": Medium dense, Coal Ash and Slag FILL; moist.		***12" DEBRIS FILL***
2		S2	16/24	2-4	8-9-12-18		Medium dense, highly WEATHERED BEDROCK; moist.	1	***WEATHERED BEDROCK***
4		S3	10/15	4-5.25	93-57-100/3		Same as above; very dense.		
							Auger Refusal at 5.25 ft.		***Bottom of Boring at 5.25'***
6									
8									
10									
12									
14									
16									
18									

GRANULAR SOILS		COHESIVE SOILS	
BLOWS/FT	DENSITY	BLOWS/FT	DENSITY
0-4	V. LOOSE	0-2	V. SOFT
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
> 50	V. DENSE	15-30	V. STIFF
		> 30	HARD

REMARKS:

1. Weathered Bedrock similar in consistency as sand and gravel material.

NOTES:

1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.

BORING No. B-2

planning, permitting, design, construction, operation, maintenance **Weston&Sampson**

PROJECT	REPORT OF BORING No.	B-3
Byram Park Pool Replacement Greenwich, CT	SHEET 1 OF 1 Project No. 2130336 CHKD BY Thomas Strike, P.E.	

BORING Co.	Seaboard Drilling Services	BORING LOCATION	See Plan		
FOREMAN	Jeff Nitsch	GROUND SURFACE ELEV.	El. 8 +/-	DATUM	NAVD88
WSE ENGINEER:	Julie Eaton	DATE START	5/28/14	DATE END	5/28/14

SAMPLER: 2 IN. OD SPLIT SPOON SAMPLER (SPT) DRIVEN 24 INCHES USING A 140 lb. SAFETY HAMMER.

CASING: HOLLOW-STEM AUGER.

CASING SIZE: 2 1/4 in. ID OTHER: N/A

GROUNDWATER READINGS

DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME
5/28/2014	N/A	4 ft. +/-	N/A	Upon Completion

DEPTH (feet)	CASING (lb./ft.)	SAMPLE No.	REC/PEN (in)	DEPTH (ft.)	BLOWS/6"	PID (ppm)	SAMPLE DESCRIPTION	NOTES	STRATUM DESCRIPTION
0	NA	S1	12/24	0-2	2-3-4-4		4" Topsoil		***4" TOPSOIL***
							Loose, dark brown, SILTY SAND FILL, trace roots; moist.		***12" SAND FILL***
2		S2	1/24	2-4	3-1-3-4		Very loose slag fragments.		***DEBRIS FILL***
4		S3	6/9	4-4.75	12-100/3		Very dense, cobble and slag fragments, some silty sand; wet.		
							Auger Refusal at 5 ft.		***Bottom of Boring at 5'***
6									
8									
10									
12									
14									
16									
18									

GRANULAR SOILS		COHESIVE SOILS	
BLOWS/FT	DENSITY	BLOWS/FT	DENSITY
0-4	V. LOOSE	0-2	V. SOFT
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
> 50	V. DENSE	15-30	V. STIFF
		> 30	HARD

REMARKS:

NOTES:
1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.

BORING No. B-3

planning, permitting, design, construction, operation, maintenance **Weston&Sampson**

PROJECT	REPORT OF BORING No.	B-4
Byram Park Pool Replacement Greenwich, CT	SHEET 1 OF 1 Project No. 2130336 CHKD BY Thomas Strike, P.E.	

BORING Co.	Seaboard Drilling Services	BORING LOCATION	See Plan		
FOREMAN	Jeff Nitsch	GROUND SURFACE ELEV.	El. 10 +/-	DATUM	NAVD88
WSE ENGINEER:	Julie Eaton	DATE START	5/28/14	DATE END	5/28/14

SAMPLER: 2 IN. OD SPLIT SPOON SAMPLER (SPT) DRIVEN 24 INCHES USING A 140 lb. SAFETY HAMMER.

CASING: HOLLOW-STEM AUGER.

CASING SIZE: 2 1/4 in. ID OTHER: N/A

GROUNDWATER READINGS

DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME
5/28/2014	N/A	Not Observed		

DEPTH (feet)	CASING (lb./ft.)	SAMPLE No.	REC/PEN (in)	DEPTH (ft.)	BLOWS/6"	PID (ppm)	SAMPLE DESCRIPTION	NOTES	STRATUM DESCRIPTION
0	NA	S1	12/24	0-2	3-2-2-3		4" Topsoil		***4" TOPSOIL***
							Loose, brown, SILTY SAND, trace gravel, trace roots; moist.		***SUBSOIL***
2									***2' +/-***
		S2	1/6	2-2.5	100		Very dense rock fragments.		***WEATHERED BEDROCK***
							Auger Refusal at 3 ft.		***Bottom of Boring at 3'***
4									
6									
8									
10									
12									
14									
16									
18									

GRANULAR SOILS		COHESIVE SOILS	
BLOWS/FT	DENSITY	BLOWS/FT	DENSITY
0-4	V. LOOSE	0-2	V. SOFT
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
> 50	V. DENSE	15-30	V. STIFF
		> 30	HARD

REMARKS:

NOTES:
1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.

BORING No. B-4

planning, permitting, design, construction, operation, maintenance **Weston&Sampson®**	PROJECT Byram Park Pool Replacement Greenwich, CT	REPORT OF BORING No. B-5 SHEET 1 OF 1 Project No. 2130336 CHKD BY Thomas Strike, P.E.

BORING Co.	Seaboard Drilling Services	BORING LOCATION	See Plan		
FOREMAN	Jeff Nitsch	GROUND SURFACE ELEV.	El. 8 +/-	DATUM	NAVD88
WSE ENGINEER:	Julie Eaton	DATE START	5/28/14	DATE END	5/28/14

SAMPLER: 2 IN. OD SPLIT SPOON SAMPLER (SPT) DRIVEN 24 INCHES USING A 140 lb. SAFETY HAMMER.

CASING: HOLLOW-STEM AUGER.

CASING SIZE: 2 1/4 in. ID OTHER: N/A

GROUNDWATER READINGS

DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME
5/28/2014	N/A	Not Observed		

DEPTH (feet)	CASING (lb./ft.)	SAMPLE No.	REC/PEN (in)	DEPTH (ft.)	BLOWS/6"	PID (ppm)	SAMPLE DESCRIPTION	NOTES	STRATUM DESCRIPTION
0	NA	S1	17/24	0-2	2-3-7-18		6" Topsoil Loose, brown, SILTY SAND FILL, trace gravel, trace roots, pvc fragments; moist.		***6" TOPSOIL***
									SAND FILL
2									***2' +/-***
		S2	14/24	2-4	37-27-29-37		Very dense, SAND and GRAVEL, cobble fragments, trace silt; moist.		***SAND AND GRAVEL***
4									
		S3	8/8	4-4.7	86-100/2"		Same as above.		
							Auger Refusal at 5 ft.		***Bottom of Boring at 5'***
6									
8									
10									
12									
14									
16									
18									

GRANULAR SOILS		COHESIVE SOILS	
BLOWS/FT	DENSITY	BLOWS/FT	DENSITY
0-4	V. LOOSE	0-2	V. SOFT
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
> 50	V. DENSE	15-30	V. STIFF
		> 30	HARD

REMARKS:

NOTES:
1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.

BORING No. B-5

planning, permitting, design, construction, operation, maintenance **Weston&Sampson®**

PROJECT	REPORT OF BORING No.	B-6
Byram Park Pool Replacement Greenwich, CT	SHEET 1 OF 1 Project No. 2130336 CHKD BY Thomas Strike, P.E.	

BORING Co.	Seaboard Drilling Services	BORING LOCATION	See Plan		
FOREMAN	Jeff Nitsch	GROUND SURFACE ELEV.	El. 9 +/-	DATUM	NAVD88
WSE ENGINEER:	Julie Eaton	DATE START	5/28/14	DATE END	5/28/14

SAMPLER: 2 IN. OD SPLIT SPOON SAMPLER (SPT) DRIVEN 24 INCHES USING A 140 lb. SAFETY HAMMER.

CASING: HOLLOW-STEM AUGER.

CASING SIZE: 2 1/4 in. ID OTHER: N/A

GROUNDWATER READINGS

DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME
5/28/2014	N/A	Not Observed		

DEPTH (feet)	CASING (lb./ft.)	SAMPLE No.	REC/PEN (in)	DEPTH (ft.)	BLOWS/6"	PID (ppm)	SAMPLE DESCRIPTION	NOTES	STRATUM DESCRIPTION
0	NA	S1	18/24	0-2	3-4-4-10		8" Topsoil		***8" TOPSOIL***
							Loose, brown, fine to mendium SAND, little gravel, little silt; moist.		***SUBSOIL***
2									***2' +/-***
		S2	11/17	2-3.4	19-21-100/5		Very dense, gray, fine to coarse SAND and GRAVEL, cobble and weathered bedrock fragments, trace silt; moist.		***SAND AND GRAVEL***
4							Auger Refusal at 3.5 ft.		***Bottom of Boring at 3.5'***
6									
8									
10									
12									
14									
16									
18									

GRANULAR SOILS		COHESIVE SOILS	
BLOWS/FT	DENSITY	BLOWS/FT	DENSITY
0-4	V. LOOSE	0-2	V. SOFT
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
> 50	V. DENSE	15-30	V. STIFF
		> 30	HARD

REMARKS:

NOTES:
1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.

BORING No. B-6

planning, permitting, design, construction, operation, maintenance **Weston&Sampson®**

PROJECT	REPORT OF BORING No.	B-7
Byram Park Pool Replacement Greenwich, CT	SHEET 1 OF 1 Project No. 2130336 CHKD BY Thomas Strike, P.E.	

BORING Co.	Seaboard Drilling Services	BORING LOCATION	See Plan		
FOREMAN	Jeff Nitsch	GROUND SURFACE ELEV.	10 ft. +/-	DATUM	NAVD88
WSE ENGINEER:	Julie Eaton	DATE START	5/28/14	DATE END	5/28/14

SAMPLER: 2 IN. OD SPLIT SPOON SAMPLER (SPT) DRIVEN 24 INCHES USING A 140 lb. SAFETY HAMMER.

CASING: HOLLOW-STEM AUGER.

CASING SIZE: 2 1/4 in. ID OTHER: N/A

GROUNDWATER READINGS

DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME
5/28/2014	N/A	4 ft. +/-	N/A	Upon Completion

DEPTH (feet)	CASING (lb./ft.)	SAMPLE No.	REC/PEN (in)	DEPTH (ft.)	BLOWS/6"	PID (ppm)	SAMPLE DESCRIPTION	NOTES	STRATUM DESCRIPTION
0	NA	S1	15/24	0-2	2-5-6-24		5" Topsoil Medium dense, brown, SILTY SAND FILL, trace gravel, slag fragments; moist.		***5" TOPSOIL***
2		S2	13/24	2-4	39-32-45-45		Very dense, grey, fine to coarse SAND and GRAVEL, trace silt; moist. (Highly Weathered Bedrock)		***SAND FILL*** ***2' +/-***
4		S3	15/21	4-5.75	78-76-88-100/3		Same as above.		***HIGHLY WEATHERED BEDROCK***
6							Auger Refusal at 6 ft.		***Bottom of Boring at 6'***
8									
10									
12									
14									
16									
18									

GRANULAR SOILS		COHESIVE SOILS	
BLOWS/FT	DENSITY	BLOWS/FT	DENSITY
0-4	V. LOOSE	0-2	V. SOFT
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
> 50	V. DENSE	15-30	V. STIFF
		> 30	HARD

REMARKS:

NOTES:
1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.

BORING No. B-7

planning, permitting, design, construction, operation, maintenance **Weston&Sampson®**	PROJECT Byram Park Pool Replacement Greenwich, CT	REPORT OF BORING No. B-8 SHEET 1 OF 1 Project No. 2130336 CHKD BY Thomas Strike, P.E.

BORING Co.	Seaboard Drilling Services	BORING LOCATION	See Plan		
FOREMAN	Jeff Nitsch	GROUND SURFACE ELEV.	El. 7 +/-	DATUM	NAVD88
WSE ENGINEER:	Julie Eaton	DATE START	5/28/14	DATE END	5/28/14

SAMPLER: 2 IN. OD SPLIT SPOON SAMPLER (SPT) DRIVEN 24 INCHES USING A 140 lb. SAFETY HAMMER.

CASING: HOLLOW-STEM AUGER.

CASING SIZE: 2 1/4 in. ID OTHER: N/A

GROUNDWATER READINGS

DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME
5/28/2014	N/A	Not Observed		

DEPTH (feet)	CASING (lb./ft.)	SAMPLE No.	REC/PEN (in)	DEPTH (ft.)	BLOWS/6"	PID (ppm)	SAMPLE DESCRIPTION	NOTES	STRATUM DESCRIPTION
0	NA	S1	14/24	0.5-2.5	12-12-18-14		4" ASPHALT Medium dense, brown, fine to coarse SAND and GRAVEL FILL, cobble fragments, trace silt; moist.		***4" ASPHALT***
2		S2	15/24	2.5-4.5	18-15-15-8		Same as above.		***SAND FILL***
4							Boring Terminated at 4.5 ft.		***Bottom of Boring at 4.5'***
6									
8									
10									
12									
14									
16									
18									

GRANULAR SOILS		COHESIVE SOILS	
BLOWS/FT	DENSITY	BLOWS/FT	DENSITY
0-4	V. LOOSE	0-2	V. SOFT
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
> 50	V. DENSE	15-30	V. STIFF
		> 30	HARD

REMARKS:

NOTES:
1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.

BORING No. B-8

planning, permitting, design, construction, operation, maintenance **Weston&Sampson®**	PROJECT Byram Park Pool Replacement Greenwich, CT	REPORT OF BORING No. B-9 SHEET 1 OF 1 Project No. 2130336 CHKD BY Thomas Strike, P.E.

BORING Co.	Seaboard Drilling Services	BORING LOCATION	See Plan
FOREMAN	Jeff Nitsch	GROUND SURFACE ELEV.	El. 9 +/- DATUM NAVD88
WSE ENGINEER:	Julie Eaton	DATE START 5/28/14	DATE END 5/28/14

SAMPLER: 2 IN. OD SPLIT SPOON SAMPLER (SPT) DRIVEN 24 INCHES USING A 140 lb. SAFETY HAMMER.

CASING: HOLLOW-STEM AUGER.

CASING SIZE: 2 1/4 in. ID OTHER: N/A

GROUNDWATER READINGS

DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME
5/28/2014	N/A	2.5 ft. +/-	N/A	Upon Completion

DEPTH (feet)	CASING (lb./ft.)	SAMPLE No.	REC/PEN (in)	DEPTH (ft.)	BLOWS/6"	PID (ppm)	SAMPLE DESCRIPTION	NOTES	STRATUM DESCRIPTION
0	NA	S1	11/24	0.5-2.5	12-16-8-8		5" Asphalt		***5" ASPHALT***
							Medium dense, brown, fine to coarse SAND and GRAVEL FILL, cobble fragments, trace silt; moist.		***SAND FILL***
2		S2	5/9	2.5-3.25	16-100/3		Same as above; wet.		
							Sampler Refusal at 3.25 ft.		***Bottom of Boring at 3.25'***
4									
6									
8									
10									
12									
14									
16									
18									

GRANULAR SOILS		COHESIVE SOILS	
BLOWS/FT	DENSITY	BLOWS/FT	DENSITY
0-4	V. LOOSE	0-2	V. SOFT
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
> 50	V. DENSE	15-30	V. STIFF
		> 30	HARD

REMARKS:

NOTES:
1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.

BORING No. B-9

planning, permitting, design, construction, operation, maintenance **Weston&Sampson®**	PROJECT Byram Park Pool Replacement Greenwich, CT	REPORT OF BORING No. B-10 SHEET 1 OF 1 Project No. 2130336 CHKD BY Thomas Strike, P.E.

BORING Co.	Seaboard Drilling Services	BORING LOCATION	See Plan		
FOREMAN	Jeff Nitsch	GROUND SURFACE ELEV.	El. 7.5 +/-	DATUM	NAVD88
WSE ENGINEER:	Julie Eaton	DATE START	5/28/14	DATE END	5/28/14

SAMPLER: 2 IN. OD SPLIT SPOON SAMPLER (SPT) DRIVEN 24 INCHES USING A 140 lb. SAFETY HAMMER.

CASING: HOLLOW-STEM AUGER.

CASING SIZE: 2 1/4 in. ID OTHER: N/A

GROUNDWATER READINGS

DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME
5/28/2014	N/A	Not Observed		

DEPTH (feet)	CASING (lb./ft.)	SAMPLE No.	REC/PEN (in)	DEPTH (ft.)	BLOWS/6"	PID (ppm)	SAMPLE DESCRIPTION	NOTES	STRATUM DESCRIPTION
0	NA	S1	14/18	0.5-2	14-8-100		3.5" Asphalt		***3.5" ASPHALT***
							Top 9": Medium dense, brown, fine to coarse SAND FILL, asphalt fragments, trace silt; moist.		***9" SAND FILL***
2							Bottom 5": Very dense, brown, fine to medium SAND, some gravel, little silt, cobble fragments; moist.		***SAND AND GRAVEL***
		S2	1/1	2-2.1	100/1"		Same as above.		
4							Sampler Refusal at 2.1 ft.		***Bottom of Boring at 2.1'***
6									
8									
10									
12									
14									
16									
18									

GRANULAR SOILS		COHESIVE SOILS	
BLOWS/FT	DENSITY	BLOWS/FT	DENSITY
0-4	V. LOOSE	0-2	V. SOFT
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
> 50	V. DENSE	15-30	V. STIFF
		> 30	HARD

REMARKS:

NOTES:
1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.

BORING No. B-10

planning, permitting, design, construction, operation, maintenance **Weston&Sampson**

PROJECT	REPORT OF BORING No.	B-11
Byram Park Pool Replacement Greenwich, CT	SHEET 1 OF 1 Project No. 2130336 CHKD BY Thomas Strike, P.E.	

BORING Co.	Seaboard Drilling Services	BORING LOCATION	See Plan		
FOREMAN	Jeff Nitsch	GROUND SURFACE ELEV.	El. 10 +/-	DATUM	NAVD88
WSE ENGINEER:	Julie Eaton	DATE START	5/28/14	DATE END	5/28/14

SAMPLER: 2 IN. OD SPLIT SPOON SAMPLER (SPT) DRIVEN 24 INCHES USING A 140 lb. SAFETY HAMMER.

CASING: HOLLOW-STEM AUGER.

CASING SIZE: 2 1/4 in. ID OTHER: N/A

GROUNDWATER READINGS

DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME
5/28/2014	N/A	Not Observed		

DEPTH (feet)	CASING (lb./ft.)	SAMPLE No.	REC/PEN (in)	DEPTH (ft.)	BLOWS/6"	PID (ppm)	SAMPLE DESCRIPTION	NOTES	STRATUM DESCRIPTION
0	NA	S1	11/14	0.5-1.7	15-23-100/2		4" Asphalt		***4" ASPHALT***
							Very dense, brown, fine to coarse SAND and GRAVEL FILL, cobble fragments, trace silt; moist.		***SAND FILL***
2									
							Sampler Refusal at 1.7 ft.		***Bottom of Boring at 1.7'***
4									
6									
8									
10									
12									
14									
16									
18									

GRANULAR SOILS		COHESIVE SOILS	
BLOWS/FT	DENSITY	BLOWS/FT	DENSITY
0-4	V. LOOSE	0-2	V. SOFT
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
> 50	V. DENSE	15-30	V. STIFF
		> 30	HARD

REMARKS:

NOTES:
1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.

BORING No. B-11

planning, permitting, design, construction, operation, maintenance **Weston&Sampson®**	PROJECT Byram Park Pool Replacement Greenwich, CT	REPORT OF BORING No. B-12 SHEET 1 OF 1 Project No. 2130336 CHKD BY Thomas Strike, P.E.

BORING Co.	Seaboard Drilling Services	BORING LOCATION	See Plan
FOREMAN	Jeff Nitsch	GROUND SURFACE ELEV.	El. 10 +/- DATUM NAVD88
WSE ENGINEER:	Julie Eaton	DATE START 5/28/14	DATE END 5/28/14

SAMPLER: 2 IN. OD SPLIT SPOON SAMPLER (SPT) DRIVEN 24 INCHES USING A 140 lb. SAFETY HAMMER.

CASING: HOLLOW-STEM AUGER.

CASING SIZE: 2 1/4 in. ID OTHER: N/A

GROUNDWATER READINGS

DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME
5/28/2014	N/A	None Observed		

DEPTH (feet)	CASING (lb./ft.)	SAMPLE No.	REC/PEN (in)	DEPTH (ft.)	BLOWS/6"	PID (ppm)	SAMPLE DESCRIPTION	NOTES	STRATUM DESCRIPTION
0	NA	S1	18/24	0.5-2.5	14-25-48-64		4" Asphalt		***4" ASPHALT***
							Top 9": Dense, brown, fine to coarse SAND and GRAVEL FILL, cobble fragments, trace silt; moist.		***9" SAND FILL***
2									
							Bottom 9": Very dense, gray, fine to coarse SAND and GRAVEL, cobble fragments, trace silt; moist. (WEATHERED BEDROCK)		***WEATHERED BEDROCK***
4		S2	0/1	2.5-2.6	100/1"		No sample recovery.		
							Sampler Refusal at 2.1 ft.		***Bottom of Boring at 2.1'***
6									
8									
10									
12									
14									
16									
18									

GRANULAR SOILS		COHESIVE SOILS	
BLOWS/FT	DENSITY	BLOWS/FT	DENSITY
0-4	V. LOOSE	0-2	V. SOFT
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
> 50	V. DENSE	15-30	V. STIFF
		> 30	HARD

REMARKS:

NOTES:
1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.

BORING No. B-12

APPENDIX C

Laboratory Test Data

Client:	Weston & Sampson Engineers				
Project:	Byran Park Pool				
Location:	Greenwich, CT			Project No:	GTX-301805
Boring ID:	TP-2	Sample Type:	bag	Tested By:	jbr
Sample ID:	---	Test Date:	05/29/14	Checked By:	jdt
Depth :	16-42 in	Test Id:	295973		
Test Comment:	---				
Sample Description:	Moist, brown silty sand				
Sample Comment:	---				

USDA Textural Classification

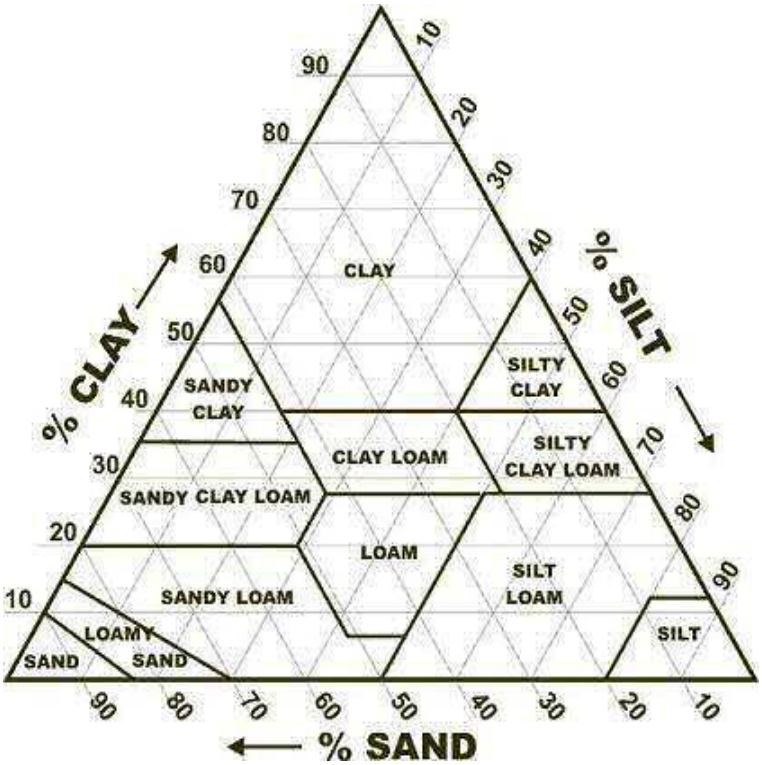
Boring ID	Sample ID	Depth	Sand, %	Silt, %	Clay, %	Classification
TP-2	---	16-42 in	65	28	7	Sandy Loam

Classifications based only on material passing the #10 sieve

Sand: material passing 2.0 mm and retained on 0.05 mm diameter

Silt: material passing 0.05 mm and retained on 0.002 mm diameter

Clay: material passing 0.002 mm diameter



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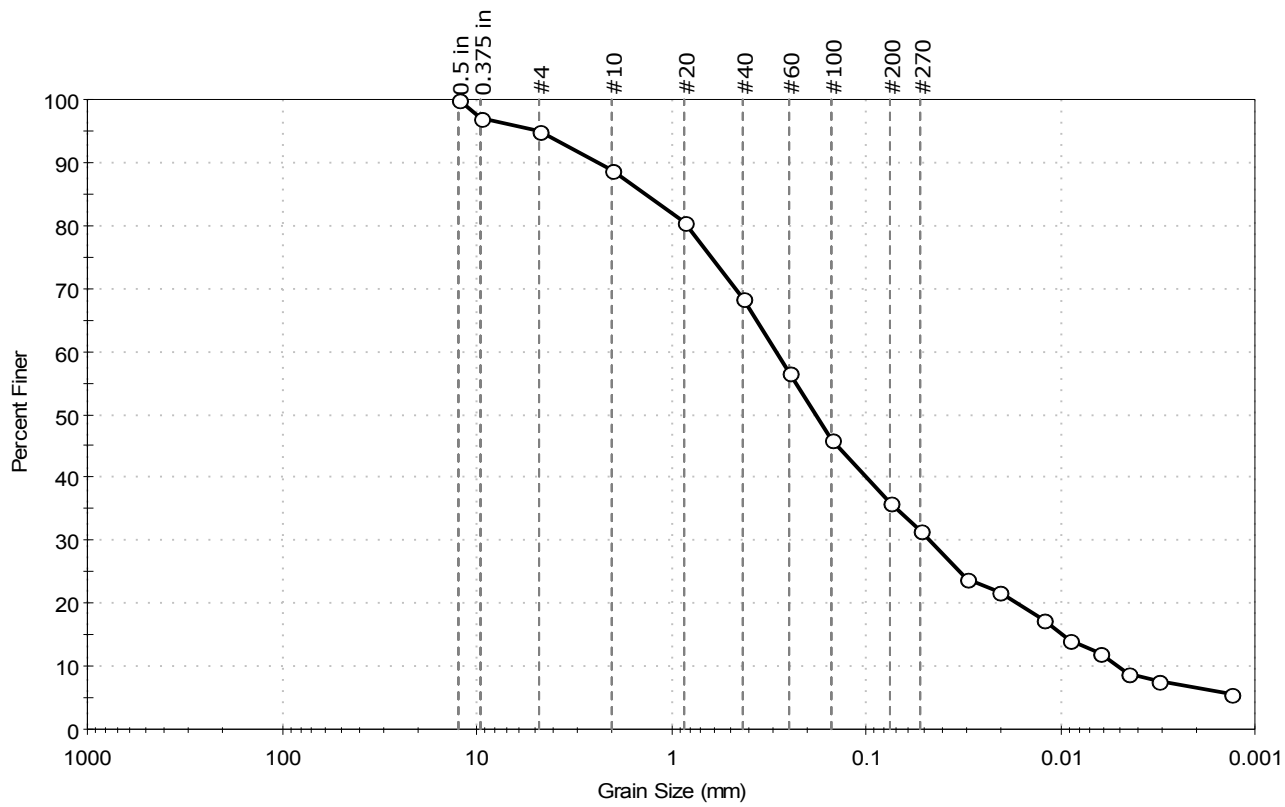
Client:	Weston & Sampson Engineers				
Project:	Byran Park Pool				
Location:	Greenwich, CT			Project No:	GTX-301805
Boring ID:	TP-2	Sample Type:	bag	Tested By:	jbr
Sample ID:	---	Test Date:	06/01/14	Checked By:	jdt
Depth :	16-42 in	Test Id:	295969		
Test Comment:	---				
Sample Description:	Moist, brown silty sand				
Sample Comment:	---				

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	5.1	58.8	36.1

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.5 in	12.50	100		
0.375 in	9.50	97		
#4	4.75	95		
#10	2.00	89		
#20	0.85	81		
#40	0.42	68		
#60	0.25	57		
#100	0.15	46		
#200	0.075	36		
#270	0.053	32		
---	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
---	0.0301	24		
---	0.0207	22		
---	0.0123	17		
---	0.0089	14		
---	0.0062	12		
---	0.0044	9		
---	0.0031	8		
---	0.0013	5		

Coefficients

D_{85} = 1.3454 mm D_{30} = 0.0471 mm
D_{60} = 0.2912 mm D_{15} = 0.0096 mm
D_{50} = 0.1818 mm D_{10} = 0.0051 mm
C_u = 57.098 C_c = 1.494

Classification

ASTM N/A

AASHTO Silty Soils (A-4 (0))

Sample/Test Description

Sand/Gravel Particle Shape : ---
Sand/Gravel Hardness : ---
Dispersion Device : Apparatus A - Mech Mixer
Dispersion Period : 1 minute
Specific Gravity : 2.65
Separation of Sample: #200 Sieve

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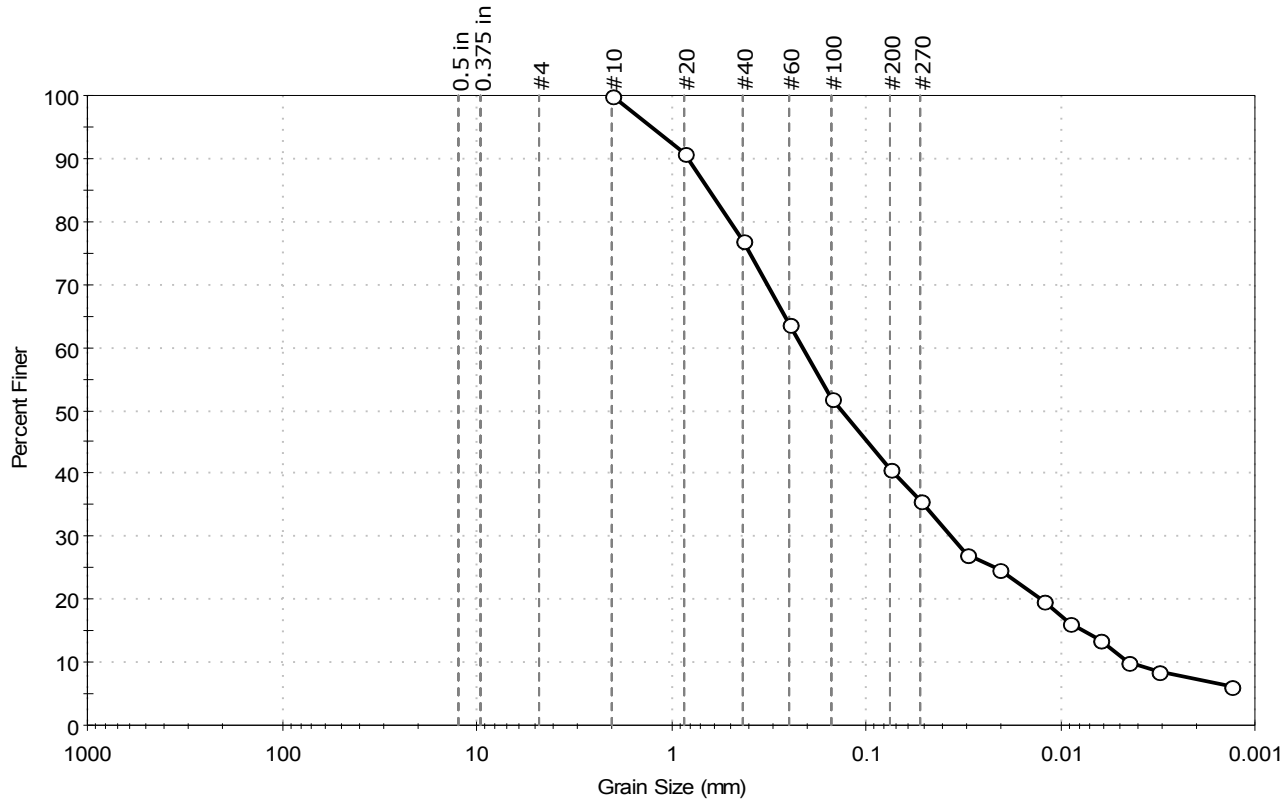
Client:	Weston & Sampson Engineers				
Project:	Byran Park Pool				
Location:	Greenwich, CT			Project No:	GTX-301805
Boring ID:	TP-2	Sample Type:	bag	Tested By:	jbr
Sample ID:	---	Test Date:	06/01/14	Checked By:	jdt
Depth :	16-42 in	Test Id:	295969		
Test Comment:	Only minus No. 10 Sieve for USDA Classification				
Sample Description:	Moist, brown silty sand				
Sample Comment:	---				

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	0.0	59.3	40.7

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#10	2.00	100		
#20	0.85	91		
#40	0.42	77		
#60	0.25	64		
#100	0.15	52		
#200	0.075	41		
#270	0.053	36		
---	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
---	0.0301	27		
---	0.0207	25		
---	0.0123	20		
---	0.0089	16		
---	0.0062	14		
---	0.0044	10		
---	0.0031	9		
---	0.0013	6		

Coefficients

D_{85} = 0.6339 mm	D_{30} = 0.0363 mm
D_{60} = 0.2127 mm	D_{15} = 0.0076 mm
D_{50} = 0.1339 mm	D_{10} = 0.0045 mm
C_u = 47.267	C_c = 1.377

Classification

ASTM N/A

AASHTO Silty Soils (A-4 (0))

Sample/Test Description

Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness : ---

Dispersion Device : Apparatus A - Mech Mixer

Dispersion Period : 1 minute

Specific Gravity : 2.65

Separation of Sample: #200 Sieve

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Client:	Weston & Sampson Engineers				
Project:	Byran Park Pool				
Location:	Greenwich, CT			Project No:	GTX-301805
Boring ID:	TP-3	Sample Type:	bag	Tested By:	jbr
Sample ID:	---	Test Date:	06/01/14	Checked By:	jdt
Depth :	22-48 in	Test Id:	295974		
Test Comment:	---				
Sample Description:	Moist, dark brown gravel with silt and sand				
Sample Comment:	---				

USDA Textural Classification

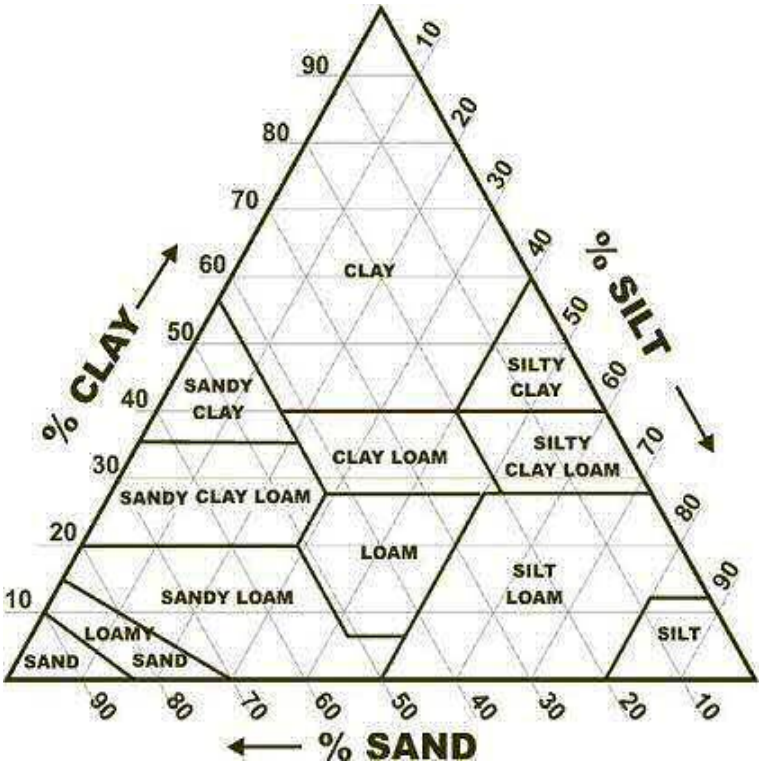
Boring ID	Sample ID	Depth	Sand, %	Silt, %	Clay, %	Classification
TP-3	---	22-48 in	78	19	3	Loamy Sand

Classifications based only on material passing the #10 sieve

Sand: material passing 2.0 mm and retained on 0.05 mm diameter

Silt: material passing 0.05 mm and retained on 0.002 mm diameter

Clay: material passing 0.002 mm diameter



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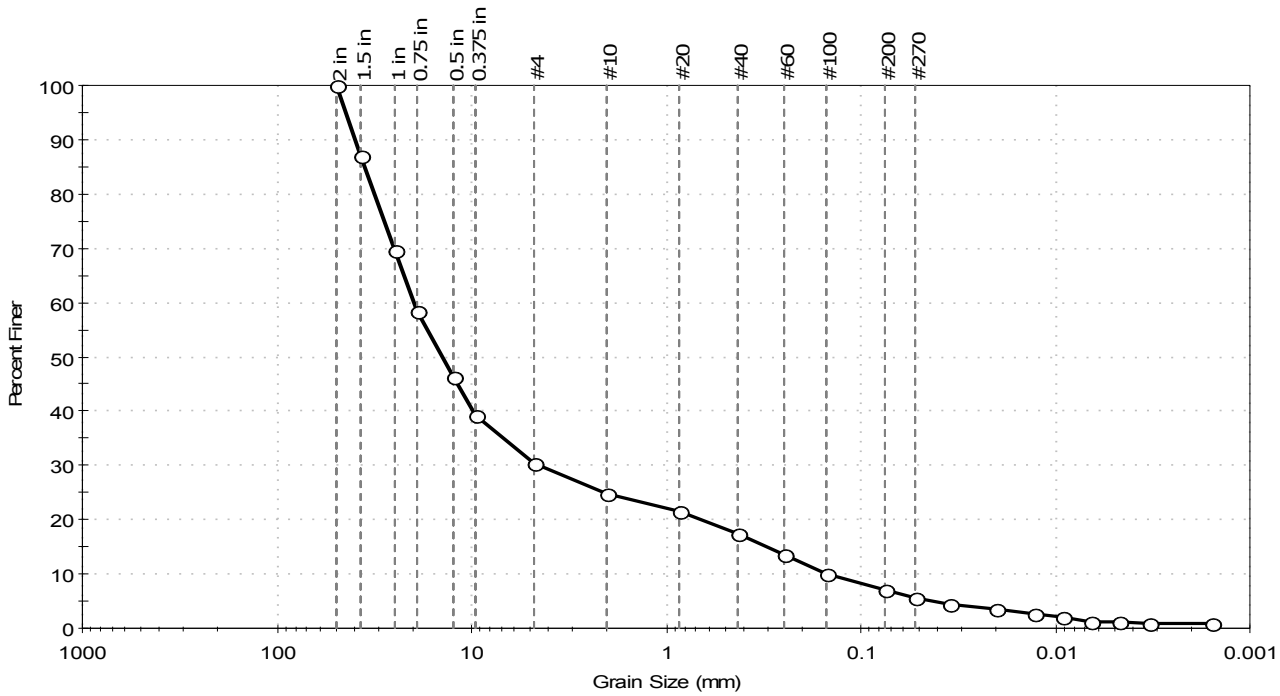
Client:	Weston & Sampson Engineers				
Project:	Byran Park Pool				
Location:	Greenwich, CT			Project No:	GTX-301805
Boring ID:	TP-3	Sample Type:	bag	Tested By:	jbr
Sample ID:	---	Test Date:	06/01/14	Checked By:	jdt
Depth :	22-48 in	Test Id:	295970		
Test Comment:	---				
Sample Description:	Moist, dark brown gravel with silt and sand				
Sample Comment:	---				

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	69.7	23.2	7.1

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
2 in	50.00	100		
1.5 in	37.50	87		
1 in	25.00	70		
0.75 in	19.00	58		
0.5 in	12.50	46		
0.375 in	9.50	39		
#4	4.75	30		
#10	2.00	25		
#20	0.85	21		
#40	0.42	17		
#60	0.25	13		
#100	0.15	10		
#200	0.075	7.1		
#270	0.053	6		
---	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
---	0.0348	4		
---	0.0201	3		
---	0.0129	3		
---	0.0092	2		
---	0.0066	1		
---	0.0047	1		
---	0.0033	1		
---	0.0016	1		

Coefficients

D_{85} = 35.8267 mm D_{30} = 4.4968 mm

D_{60} = 19.7757 mm D_{15} = 0.3100 mm

D_{50} = 14.1875 mm D_{10} = 0.1479 mm

C_u = 133.710 C_c = 6.914

Classification

ASTM N/A

AASHTO Stone Fragments, Gravel and Sand (A-1-a (1))

Sample/Test Description

Sand/Gravel Particle Shape : ANGULAR

Sand/Gravel Hardness : HARD

Dispersion Device : Apparatus A - Mech Mixer

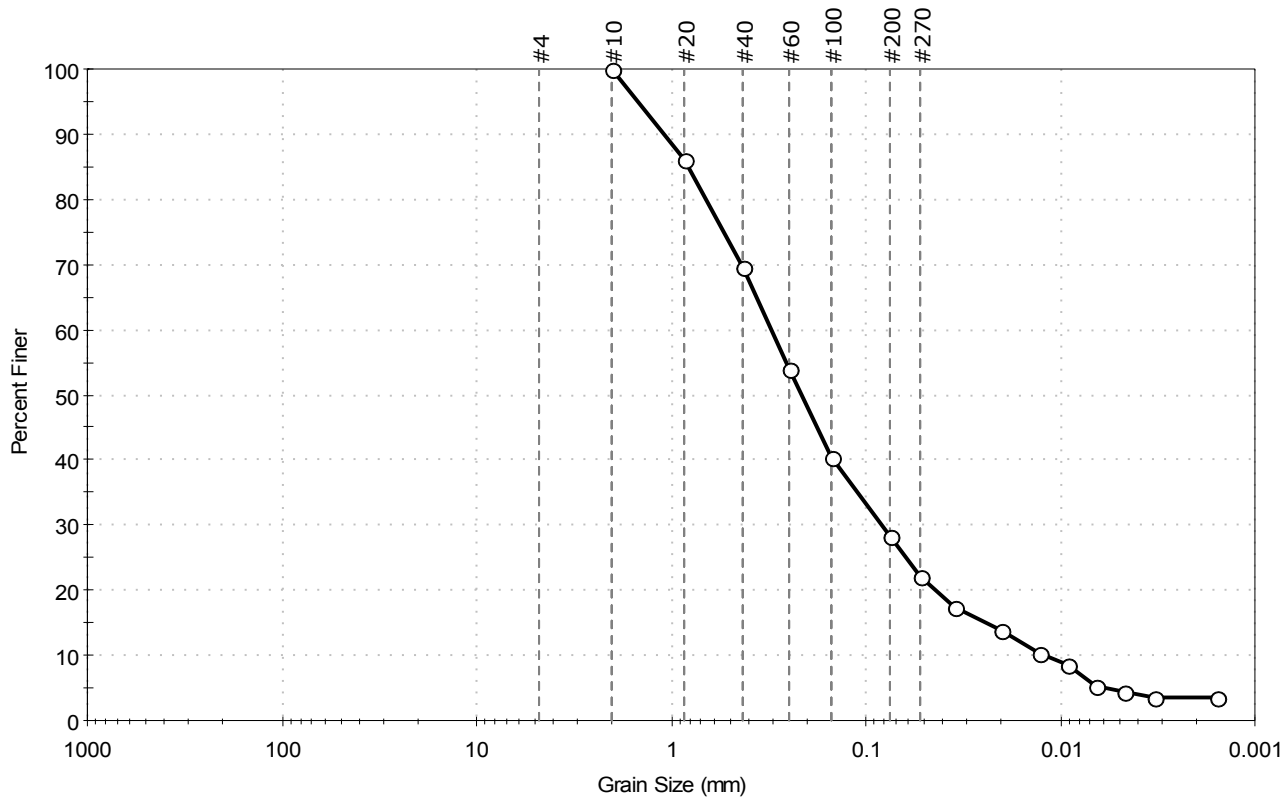
Dispersion Period : 1 minute

Specific Gravity : 2.65

Separation of Sample: #200 Sieve

Client:	Weston & Sampson Engineers				
Project:	Byran Park Pool				
Location:	Greenwich, CT			Project No:	GTX-301805
Boring ID:	TP-3	Sample Type:	bag	Tested By:	jbr
Sample ID:	---	Test Date:	06/01/14	Checked By:	jdt
Depth :	22-48 in	Test Id:	295970		
Test Comment:	Only minus No. 10 Sieve for USDA Classification				
Sample Description:	Moist, dark brown gravel with silt and sand				
Sample Comment:	---				

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	0.0	71.6	28.4

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#10	2.00	100		
#20	0.85	86		
#40	0.42	70		
#60	0.25	54		
#100	0.15	40		
#200	0.075	28		
#270	0.053	22		
---	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
---	0.0348	17		
---	0.0201	14		
---	0.0129	10		
---	0.0092	9		
---	0.0066	5		
---	0.0047	4		
---	0.0033	3		
---	0.0016	3		

Coefficients

D_{85} = 0.8095 mm D_{30} = 0.0821 mm
D_{60} = 0.3063 mm D_{15} = 0.0242 mm
D_{50} = 0.2147 mm D_{10} = 0.0119 mm
C_u = 25.739 C_c = 1.849

Classification

ASTM N/A

AASHTO Silty Gravel and Sand (A-2-4 (0))

Sample/Test Description

Sand/Gravel Particle Shape : ANGULAR
Sand/Gravel Hardness : HARD
Dispersion Device : Apparatus A - Mech Mixer
Dispersion Period : 1 minute
Specific Gravity : 2.65
Separation of Sample: #200 Sieve

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Client:	Weston & Sampson Engineers				
Project:	Byran Park Pool				
Location:	Greenwich, CT			Project No:	GTX-301805
Boring ID:	TP-6	Sample Type:	bag	Tested By:	jbr
Sample ID:	---	Test Date:	06/01/14	Checked By:	jdt
Depth :	38-58 in	Test Id:	295975		
Test Comment:	---				
Sample Description:	Moist, dark brown silty gravel with sand				
Sample Comment:	---				

USDA Textural Classification

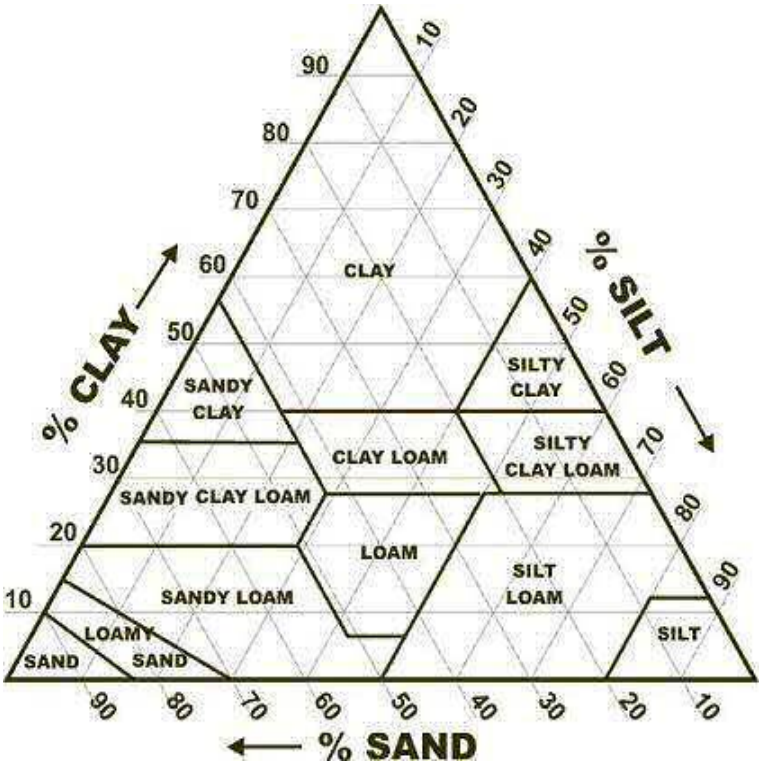
Boring ID	Sample ID	Depth	Sand, %	Silt, %	Clay, %	Classification
TP-6	---	38-58 in	72	22	6	Sandy Loam

Classifications based only on material passing the #10 sieve

Sand: material passing 2.0 mm and retained on 0.05 mm diameter

Silt: material passing 0.05 mm and retained on 0.002 mm diameter

Clay: material passing 0.002 mm diameter



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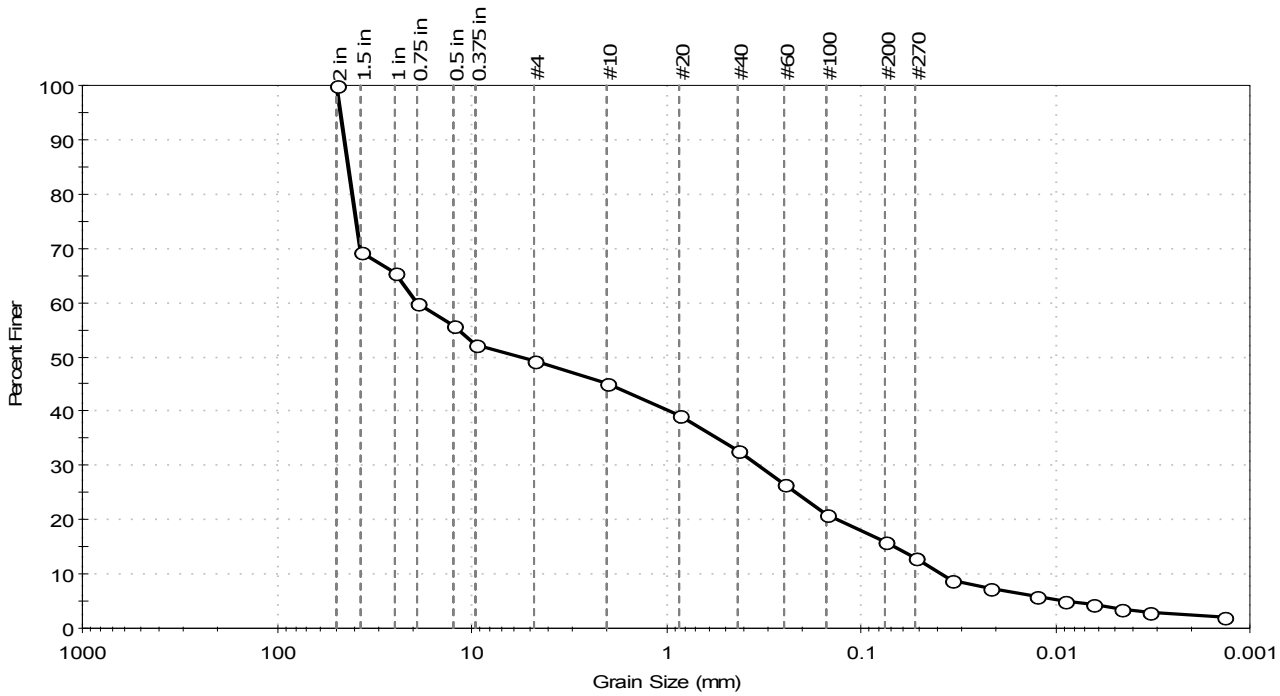
Client:	Weston & Sampson Engineers				
Project:	Byran Park Pool				
Location:	Greenwich, CT			Project No:	GTX-301805
Boring ID:	TP-6	Sample Type:	bag	Tested By:	jbr
Sample ID:	---	Test Date:	06/01/14	Checked By:	jdt
Depth :	38-58 in	Test Id:	295971		
Test Comment:	---				
Sample Description:	Moist, dark brown silty gravel with sand				
Sample Comment:	---				

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	50.6	33.4	16.0

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
2 in	50.00	100		
1.5 in	37.50	69		
1 in	25.00	65		
0.75 in	19.00	60		
0.5 in	12.50	56		
0.375 in	9.50	52		
#4	4.75	49		
#10	2.00	45		
#20	0.85	39		
#40	0.42	33		
#60	0.25	27		
#100	0.15	21		
#200	0.075	16		
#270	0.053	13		
---	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
---	0.0338	9		
---	0.0219	7		
---	0.0125	6		
---	0.0090	5		
---	0.0065	4		
---	0.0046	4		
---	0.0033	3		
---	0.0014	2		

Coefficients

D_{85} = 43.4338 mm D_{30} = 0.3368 mm
D_{60} = 19.1735 mm D_{15} = 0.0668 mm
D_{50} = 5.5054 mm D_{10} = 0.0387 mm
C_u = 495.439 C_c = 0.153

Classification

ASTM N/A

AASHTO Stone Fragments, Gravel and Sand (A-1-b (0))

Sample/Test Description

Sand/Gravel Particle Shape : ROUNDED
Sand/Gravel Hardness : HARD
Dispersion Device : Apparatus A - Mech Mixer
Dispersion Period : 1 minute
Specific Gravity : 2.65
Separation of Sample: #200 Sieve

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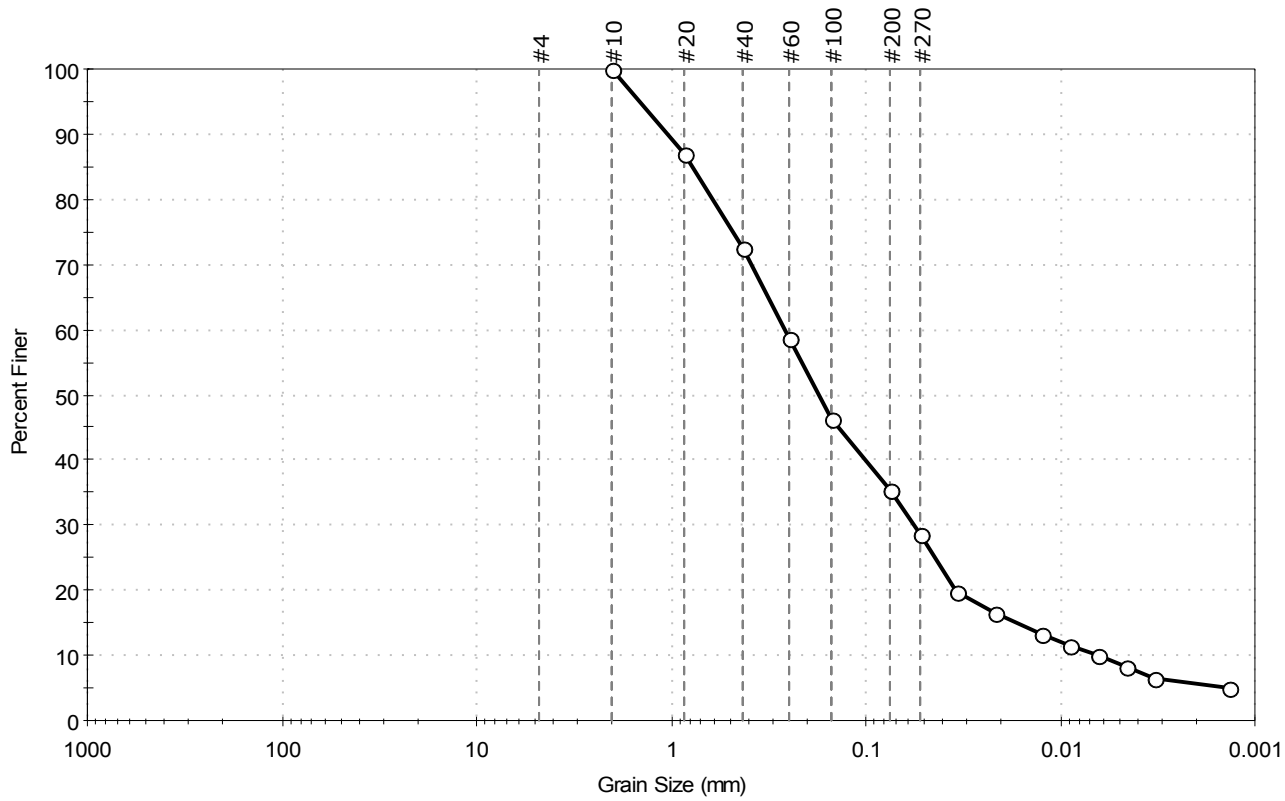
Client:	Weston & Sampson Engineers				
Project:	Byran Park Pool				
Location:	Greenwich, CT			Project No:	GTX-301805
Boring ID:	TP-6	Sample Type:	bag	Tested By:	jbr
Sample ID:	---	Test Date:	06/01/14	Checked By:	jdt
Depth :	38-58 in	Test Id:	295971		
Test Comment:	Only minus No. 10 Sieve for USDA Classification				
Sample Description:	Moist, dark brown silty gravel with sand				
Sample Comment:	---				

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	0.0	64.6	35.4

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#10	2.00	100		
#20	0.85	87		
#40	0.42	72		
#60	0.25	59		
#100	0.15	46		
#200	0.075	35		
#270	0.053	29		
---	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
---	0.0338	20		
---	0.0219	17		
---	0.0125	13		
---	0.0090	12		
---	0.0065	10		
---	0.0046	8		
---	0.0033	7		
---	0.0014	5		

Coefficients

D_{85} = 0.7701 mm D_{30} = 0.0566 mm
D_{60} = 0.2629 mm D_{15} = 0.0169 mm
D_{50} = 0.1743 mm D_{10} = 0.0066 mm
C_u = 39.833 C_c = 1.846

Classification

ASTM N/A

AASHTO Silty Soils (A-4 (0))

Sample/Test Description

Sand/Gravel Particle Shape : ROUNDED
Sand/Gravel Hardness : HARD
Dispersion Device : Apparatus A - Mech Mixer
Dispersion Period : 1 minute
Specific Gravity : 2.65
Separation of Sample: #200 Sieve

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Client:	Weston & Sampson Engineers				
Project:	Byran Park Pool				
Location:	Greenwich, CT			Project No:	GTX-301805
Boring ID:	TP-7	Sample Type:	bag	Tested By:	jbr
Sample ID:	---	Test Date:	06/01/14	Checked By:	jdt
Depth :	32-48 in	Test Id:	295976		
Test Comment:	---				
Sample Description:	Moist, dark brown silty sand				
Sample Comment:	----				

USDA Textural Classification

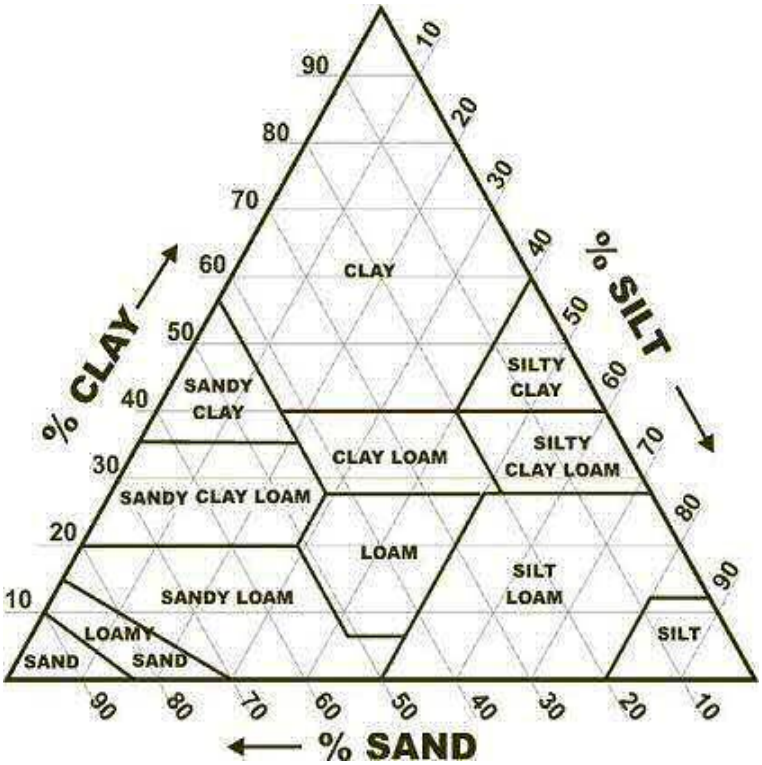
Boring ID	Sample ID	Depth	Sand, %	Silt, %	Clay, %	Classification
TP-7	---	32-48 in	64	32	4	Sandy Loam

Classifications based only on material passing the #10 sieve

Sand: material passing 2.0 mm and retained on 0.05 mm diameter

Silt: material passing 0.05 mm and retained on 0.002 mm diameter

Clay: material passing 0.002 mm diameter



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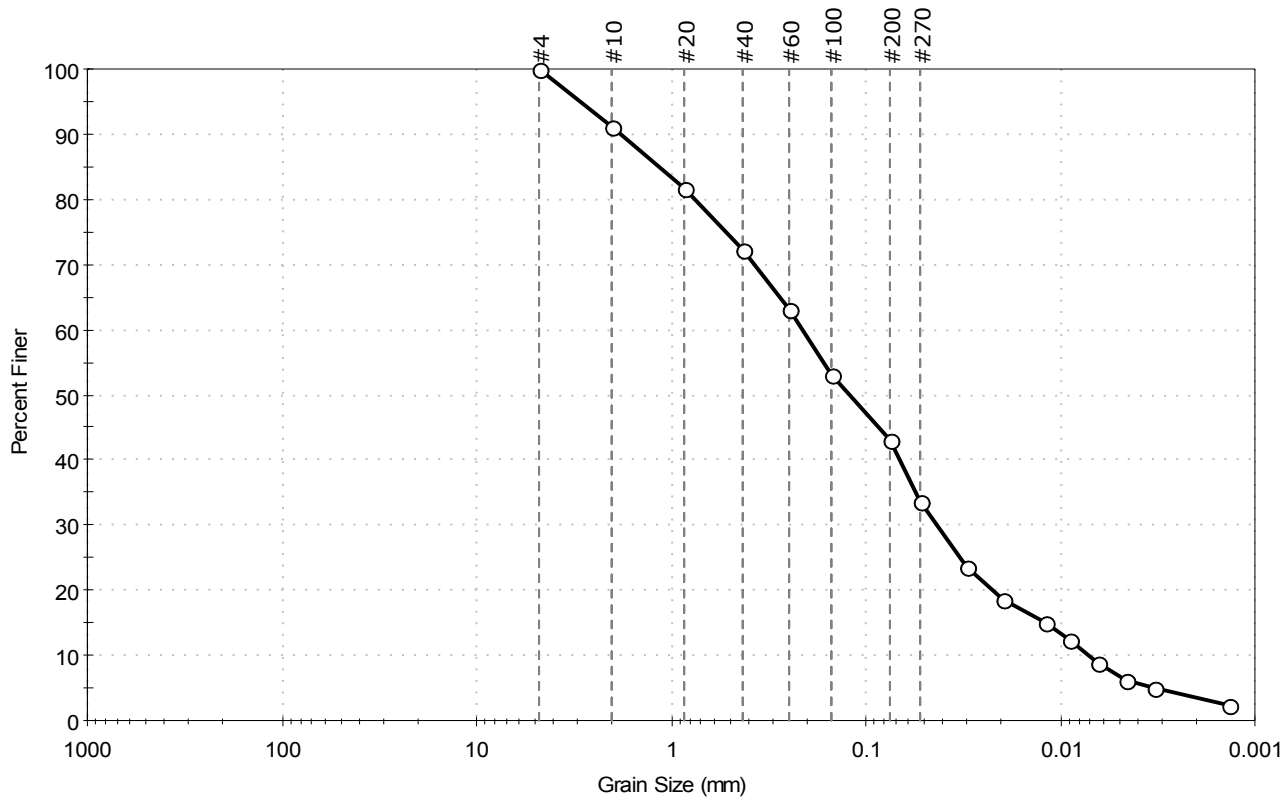
Client:	Weston & Sampson Engineers				
Project:	Byran Park Pool				
Location:	Greenwich, CT			Project No:	GTX-301805
Boring ID:	TP-7	Sample Type:	bag	Tested By:	jbr
Sample ID:	---	Test Date:	06/01/14	Checked By:	jdt
Depth :	32-48 in	Test Id:	295972		
Test Comment:	---				
Sample Description:	Moist, dark brown silty sand				
Sample Comment:	----				

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	0.0	56.8	43.2

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	91		
#20	0.85	82		
#40	0.42	72		
#60	0.25	63		
#100	0.15	53		
#200	0.075	43		
#270	0.053	33		
---	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
---	0.0304	24		
---	0.0197	19		
---	0.0121	15		
---	0.0089	12		
---	0.0064	9		
---	0.0046	6		
---	0.0033	5		
---	0.0014	2		

Coefficients

D_{85} = 1.1424 mm D_{30} = 0.0435 mm
D_{60} = 0.2123 mm D_{15} = 0.0121 mm
D_{50} = 0.1209 mm D_{10} = 0.0072 mm
C_u = 29.486 C_c = 1.238

Classification

ASTM N/A

AASHTO Silty Soils (A-4 (0))

Sample/Test Description

Sand/Gravel Particle Shape : ---
Sand/Gravel Hardness : ---
Dispersion Device : Apparatus A - Mech Mixer
Dispersion Period : 1 minute
Specific Gravity : 2.65
Separation of Sample: #200 Sieve

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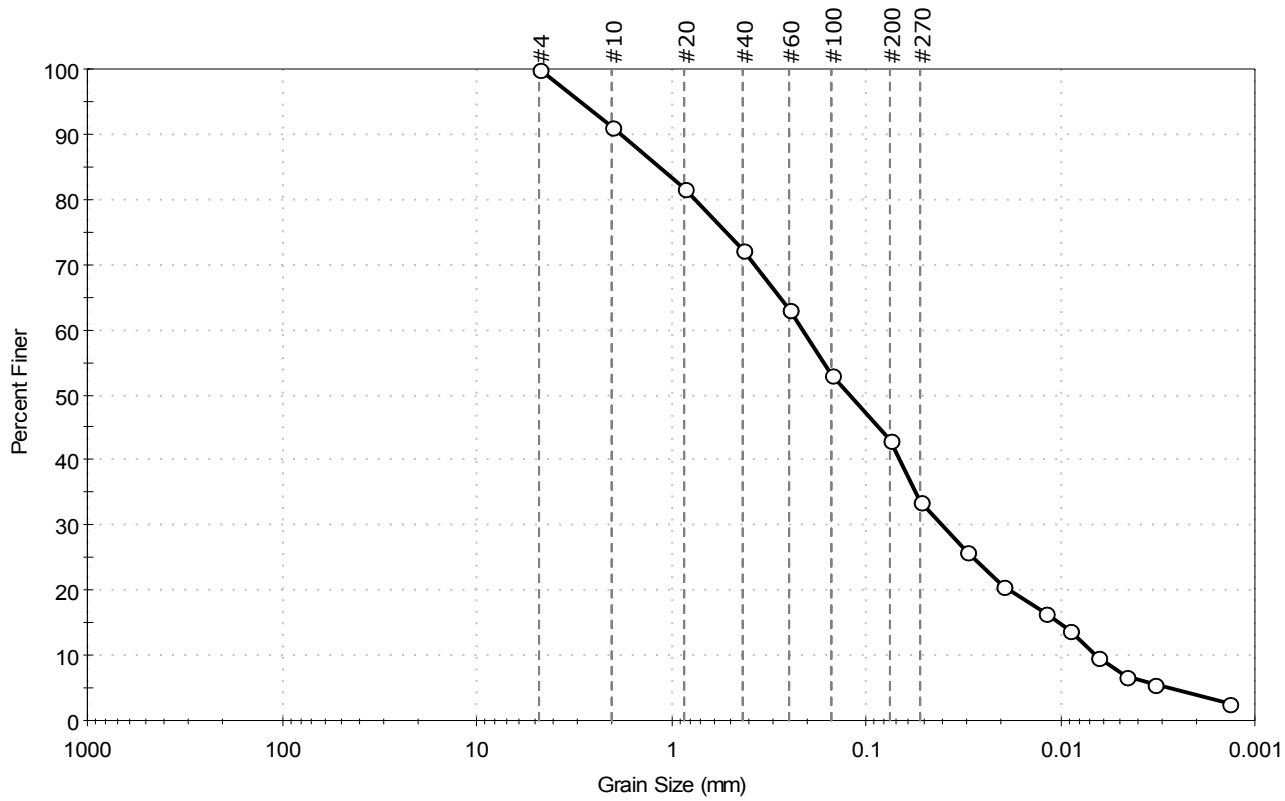
Client:	Weston & Sampson Engineers				
Project:	Byran Park Pool				
Location:	Greenwich, CT			Project No:	GTX-301805
Boring ID:	TP-7	Sample Type:	bag	Tested By:	jbr
Sample ID:	---	Test Date:	06/01/14	Checked By:	jdt
Depth :	32-48 in	Test Id:	295972		
Test Comment:	Only minus No. 10 Sieve for USDA Classification				
Sample Description:	Moist, dark brown silty sand				
Sample Comment:	----				

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	0.0	56.8	43.2

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	91		
#20	0.85	82		
#40	0.42	72		
#60	0.25	63		
#100	0.15	53		
#200	0.075	43		
#270	0.053	33		
---	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
---	0.0304	26		
---	0.0197	21		
---	0.0121	16		
---	0.0089	14		
---	0.0064	10		
---	0.0046	7		
---	0.0033	5		
---	0.0014	3		

Coefficients

D_{85} = 1.1424 mm D_{30} = 0.0408 mm
D_{60} = 0.2123 mm D_{15} = 0.0102 mm
D_{50} = 0.1209 mm D_{10} = 0.0066 mm
C_u = 32.167 C_c = 1.188

Classification

ASTM N/A

AASHTO Silty Soils (A-4 (0))

Sample/Test Description

Sand/Gravel Particle Shape : ---
Sand/Gravel Hardness : ---
Dispersion Device : Apparatus A - Mech Mixer
Dispersion Period : 1 minute
Specific Gravity : 2.65
Separation of Sample: #200 Sieve

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