

**TOWN OF TRUMBULL  
REQUEST FOR PROPOSAL**

**CHESTNUT HILL ROAD RECONSTRUCTION PROJECT**

**TRUMBULL RFP# 6344  
LOTICP Project # L144-0003**

**Due: March 21, 2019**

**Addendum #2 Dated March 5, 2019 @ 2 PM**

Bidders are hereby informed that the Bidding Documents for the above-mentioned Project are modified, corrected, and/or supplemented as follows. Addendum No. 2 becomes part of the Bidding Documents and Contract Documents.

Acknowledge receipt of this addendum by inserting its number in the Bid Proposal form. Failure to acknowledge receipt of the Addendum may subject the Bidder to disqualification.

This addendum is issued for questions that have come forth.

**Question No. 2-1.:** *Plan Sheet HD-2 calls out for guiderail to be removed and reset. Bid Proposal Form does not include an item for remove and reset. Bid Items include Remove Guiderail, MBR (RB-350), R-B 350 Bridge Attachment, R-B End Anchorage Type II. Please clarify:*

**Response No. 2-1.:** Bid Proposal Form is correct. Therefore, the call-out on the Sheet HD-2, Sta. 7+70 Left

“REMOVE AND RESET  
EX. GUIDERAIL AS REQ.  
(TYPICAL ALL SIDES)”

**shall be changed as follows:**

“REMOVE EXISTING GUIDERAIL  
INSTALL NEW MBR (R-B 350),  
R-B 350 BRIDGE ATTACHMENTS  
AND R-B 350 TYPE II END ANCHORAGES  
IN SAME LOCATION AS EXISTING  
(TYPICAL ALL SIDES)”

**Question No. 2-2.:** *How is temporary pavement for installation of storm drainage to be paid? There isn't a bid item on the Bid Proposal Form.*

**Response No. 2-2:** Cost of temporary pavement for installation of storm drainage shall be included in the cost of Item 0205001 Trench Excavation 0'-4' or Item 0205003 Trench Excavation 0'-10' as appropriate. Trench excavation items shall include sawcutting existing pavement, placing and compacting 16" of Processed Aggregate Base and 4" of Bituminous Concrete Class 1 Binder. Refer to detail "Temporary Pavement Repair" on Drawing SPD-2, Sheet 27 of 47. HMA S0.5 may be substituted for Class 1 Bituminous Concrete.

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All technical inquiries regarding this request may be directed to Roy Seelye, PE at BETA Group, Inc., (860) 513-1503, [rseelye@beta-inc.com](mailto:rseelye@beta-inc.com) or William Maurer, Town of Trumbull, Engineering Department, (203) 452-5050, [wmaurer@trumbull-ct.gov](mailto:wmaurer@trumbull-ct.gov). All other questions shall be directed to Kevin Bova, (203) 452-5042, [kbova@trumbull-ct.gov](mailto:kbova@trumbull-ct.gov).



Consulting  
Engineers and  
Scientists

## Geotechnical Report Roadway Improvements

Chestnut Hill Road  
Trumbull, Connecticut

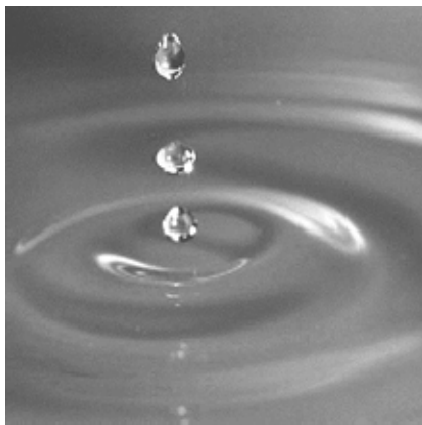
**Submitted to:**

BETA Group, Inc.  
1010 Wethersfield Avenue  
Hartford, CT 06114

**Submitted by:**

GEI Consultants, Inc.  
455 Winding Brook Drive, Suite 201  
Glastonbury, CT 06033  
860-368-5300

July 12, 2017  
Project No. 1702527



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Matthew Glunt, P.E.  
Senior Geotechnical Engineer

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# 1. Introduction

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## 1.1 Purpose

GEI understands that the Town of Trumbull is looking into roadway improvements on Chestnut Hill Road including vertical and horizontal realignment, new pavement, and drainage improvements. The total length of the project is approximately 2,600 linear feet. This report was prepared to summarize the findings of recent exploratory borings and to provide recommendations for design and construction.

## 1.2 Scope of Services

GEI's scope of work for this project included the following:

1. Engaged a subcontractor to drill nine (9) test borings.
2. Observed soil samples recovered from the test borings and prepared test boring logs.
3. Engaged a testing laboratory to perform laboratory analyses on soil samples from the test borings.
4. Summarize the geotechnical considerations associated with the proposed improvements.
5. Prepared this *Geotechnical Report*.

## 1.3 Authorization

Our work was performed in accordance with the terms and conditions of our Sub-consultant Agreement with BETA Group dated May 19, 2017.

## 1.4 GEI Team

The following personnel at GEI were involved with this work:

Matthew Glunt, P.E.	Project Manager/Technical Review
Laura McKiernan, P.E.	Geotechnical Engineer
Sarah Cote, E.I.T.	Field Engineer

## **2. Site and Project Description**

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### **2.1 Site Description**

Chestnut Hill Road is located in a residential area of Trumbull, Connecticut, as shown on Figure 1. It connects Route 111 (Main Street) with Madison Avenue, for a total length of approximately 2,600 linear feet.

The current alignment contains sharp curves with limited sight distance and is very steep in certain areas. Proceeding west from Main Street, the profile rises sharply to a hilltop near Parkway Drive, then back down a relatively steep grade to Candlewood Road. After that, the profile continues through a relatively flat area, crossing over Horse Tavern Brook with a culvert, then on a slight incline approaching Madison Avenue. Judging from the neighboring topography, minor cuts and fills were likely used during road construction to smooth the profile where the native grades were steep.

### **2.2 Project Description**

We understand plans are still being finalized; however, the overall goals of the project are as follows:

1. Repair the road surface and improve the drainage along Chestnut Hill Road.
2. Improve the horizontal and vertical road alignment where feasible for better sight distances and safer traffic flow.

The geotechnical investigation detailed herein was tailored around these concepts.

### **3. Exploration Procedures**

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#### **3.1 Test Borings**

The boring locations were marked along the alignment at or near locations requested by BETA Group. The locations shown on Figure 2 should be considered approximate.

General Borings, Inc., under subcontract to GEI, drilled nine (9) borings at the site on June 7, 2017. The appropriate one-call utility locate service (CBYD) was contacted by the subcontractor prior to their arrival. The borings were advanced using a truck-mounted drilling rig to depths of about 7 feet below pavement grade.

Standard Penetration Testing (SPT) and split-spoon sampling was performed at three consecutive intervals below the pavement and gravel base. The drilling rig used was equipped with a 140-lb safety hammer. Representative samples of the soils obtained from the borings were classified in general accordance with ASTM D2488 by the on-site GEI engineer. The samples were placed in appropriately identified sealed glass jars and transported to the local GEI office for storage and laboratory assignment.

After each boring was completed, the holes were backfilled with drill cuttings, and patched at the surface using cold patch asphalt.

Soil test boring logs are attached in Appendix A.

#### **3.2 Laboratory Testing**

Laboratory testing was performed on selected samples collected during the exploration program. Testing was performed by GeoTesting Express, under subcontract to GEI. Grain size analyses and moisture contents were performed to aid in soil classification and estimation of engineering properties.

Laboratory testing results are presented in Appendix B.

## 4. Subsurface Conditions

### 4.1 Geologic Setting

Local geology maps indicates that the site is underlain by glacial till on the uplands and outwash sand and gravel deposits along the lower areas adjacent to Horse Tavern Brook. Bedrock is mapped as either medium to dark gray, medium-grained schist or light-gray, fine to medium-grained gneiss of the Trap Falls formation.

### 4.2 Subsurface Conditions

The subsurface conditions encountered by our test borings are summarized below. The subsurface conditions are known only at the sample locations, and the subsurface conditions may vary significantly from those described below at other locations.

**Table 1: Boring Results**

Boring ID	Thickness (in.)		
	Bituminous Pavement	Gravel Base	Direct Subgrade
B-1	8.0	2.0	Sand with Gravel (SW), 10% silt
B-2	5.0	--	Sand with Gravel (SW), ~10% silt
B-3	8.0	--	Silty Sand with Gravel (SM), 37% silt (Fill)
B-4	6.0	--	Sand with Gravel (SW), 13% silt (Fill)
B-5	8.0	2.0	Sand with Gravel (SW), ~5% silt
B-6	7.0	2.0	Silty Sand with Gravel (SM), 31% silt (Fill)
B-7	4.0	3.0	Silty Sand (SM), ~15% silt
B-8	7.0	5.0	Silty Sand with Gravel (SM), 24% silt
B-9	8.0	4.0	Silty Sand (SM), ~20% silt

**Pavement Section** – Photos of the pavement cores are attached in Appendix A. The asphalt section at the boring locations was variable, measuring between 4 inches and 8 inches.

**Gravel Base** – A distinct layer of layer of angular gravel base, approximately 2 to 5 inches thick, was encountered below the pavement at most locations.

**Existing Fill** – A layer of granular fill was encountered in borings B-3, B-4, and B-6 underlying the pavement section. The material differs from the native soils in color (gray to



dark gray) and often contains a higher proportion of silty fines. The areas with noted fill in the borings generally coincide with a sloped alignment where it appears the roadway was raised slightly.

**Native Sand and Gravel** – Sand and gravel deposits were encountered below the pavement section in lower areas of the alignment, west of Samuel Street. Recovered samples were generally classified as brown to light brown sands with 10 to 20 percent silty fines and 5 to 35 percent gravel. SPT N-values typically varied between 39 and 46 blows/foot, indicating dense conditions. Oversize cobbles were noted in boring B-3, near the eastern limits of the low-lying area, at a depth of about 5 feet and continuing to termination depth.

**Glacial Till**– Sandy glacial till was encountered on the upland portions of the alignment, generally east of Samuel Street. Samples were typically classified as brown to light brown or grayish-brown sands with 5 to 25 percent silty fines and up to 35 percent gravel. Oversize cobble fragments were noted in the glacial till in borings B-5 and B-6 at a depth of about 5 feet. The SPT N-values in the glacial till were generally between 73 and 111 blows/foot, indicating very dense conditions.

### **4.3 Groundwater Conditions**

The stabilized groundwater table was not encountered during the investigation. Several of the near-surface samples were noted as wet when sampled, which was likely a result of the water introduced during pavement coring.

Groundwater levels are subject to seasonal and weather-related variations. Groundwater measurements made at different times and different locations may be significantly different than the measurements taken as part of this investigation.

## **5. Geotechnical Considerations**

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Recommendations presented herein are based on our understanding of conceptual plans. The recommendations provided herein should be reviewed by GEI for continued applicability if and when revisions are made by the design team concerning configuration, grading, etc.

### **5.1 General Suitability**

We do not anticipate that groundwater or bedrock will be encountered during the types of earthwork activities expected for this project. However, oversize cobbles (up to approximately 12 inches) could be encountered in deeper excavations, such as for utility trenches or larger cut areas required for profile flattening.

The granular fills and native sands currently serving as subgrade for the pavement section are not suitable, due to their generally high silt content, and should be replaced with a well-drained processed aggregate base course meeting ConnDOT specifications.

### **5.2 Pavement Section**

The Town standard pavement section of 2.0 inches surface course, 2.0 inches binder course and 12 inches of processed aggregate base is suitable for a 20-year design life for this project. The new roadway sections should be constructed in accordance with ConnDOT specification and those of Town of Trumbull, where applicable.

### **5.3 Excavation and Backfill**

All excavations should be sloped or shored in accordance with the local, state, and federal regulations, including Occupational Safety and Health Agency (OSHA 29 CFR Part 1926) excavation trench safety standards.

Excavation is expected to be in soil, and conventional excavation with a backhoe appears feasible. Based on the boring results, oversize (greater than 6 inches) cobbles/small boulders may be encountered in any excavations on the order of 4 feet or more below current grade. Groundwater is not likely to significantly impact grading operations. However, maintaining proper site drainage throughout will be critical to the success of earthwork operations.

Provided the material can meet the appropriate compaction requirements, does not contain deleterious materials (including material in excess of 3 inches), and is stable under the weight of construction equipment, as required, excavated soils should generally be suitable for re-use on the project as general fill below the processed aggregate base layer. This material should be placed in maximum 9-inch-thick, loose lifts to at least 95 percent of the maximum

dry density determined in accordance with ASTM D1557 (Modified AASHTO Compaction). The moisture content should be held to within +/- 3 percent of optimum moisture content (as determined by ASTM D1557).

## **5.4 Site Slopes**

Minor cuts and fills may be used to flatten steep areas along the current alignment. We recommend all constructed slopes on the project be designed with a grade not exceeding 2H:1V in steepness. Where feasible, we also recommend that the top of re-graded slopes be located at least 10 feet horizontally from the edges of buildings and pavements, to reduce the potential for damages caused by shallow sloughing.

In areas where fill slope materials match an existing sloping ground surface, the lifts of fill should be benched into the existing sloping ground surface by cutting into the sloping ground surface and stair-stepping subsequent lifts of fill to prevent a planar interface between the proposed fill slope and the existing ground surface.

The soils exposed on all slope faces should be compacted with track-mounted equipment prior to covering with an erosion control fabric. The erosion control mat and vegetation should be placed as soon as feasibly possible on the exposed slope.

## 6. Limitations

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Our recommendations are based on the project information provided to us at the time of this report and may require modification if there are any changes in the nature, design, or location of the proposed construction. We recommend that GEI be engaged to review the final plans and specifications to judge whether changes in the project affect the validity of our recommendations and whether our recommendations have been properly implemented in the design.

The recommendations in this report are based in part on the data obtained from the borings. The nature and extent of variations between borings may not become evident until construction. If variations from the anticipated conditions are encountered, it may be necessary to revise the recommendations in this report. Therefore, we recommend that GEI be engaged to make site visits during construction to: a) check that the subsurface conditions exposed during construction are in general conformance with our design assumptions and b) ascertain that, in general, the geotechnical aspects of the work are being performed in compliance with the contract documents.

Our professional services for this project have been performed in accordance with generally accepted engineering practices; no warranty, express or implied, is made.

## Figures

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**SOURCE:** BingMaps

SCALE:	NTS
DRAWN BY:	SC
CHECKED BY:	--
DATE:	6/12/2017



**SITE LOCATION PLAN**  
**CHESTNUT HILL ROAD**  
**TRUMBULL, CONNECTICUT**

GEI PROJECT NO: 1702527

FIGURE NO.

1



**LEGEND**

 Approximate Boring Locations



SCALE:	NTS
DRAWN BY:	SC
CHECKED BY:	--
DATE:	6/12/2017



<b>BORING LOCATION PLAN</b> CHESTNUT HILL ROAD TRUMBULL, CONNECTICUT	
GEI PROJECT NO:	1702527

FIGURE NO.
2

1. W18 [Accumulated ESALs]	659,276				
Z <sub>r</sub>	-1.28	ZR			
Std Dev	0.45	S			
ΔPSI	2.20	DPSI			
2. Subgrade M[r]	10000	psi			
	Surface mix	Base mix	P.A.B.	subbase	
a[i]	0.44	0.34	0.14	0.11	
D[i], inches	2.00	2.00	12.00	0.00	inches
m[i]		1.00	1.00	1.00	
3. Reliability, %	90	R			

4. Initial and terminal serviceability	Po	Pt
ΔPSI	4.20	2.00
Provided SN	3.24	
Required SN (Solver will fill in)	2.82	Adequate
log10(W18) =	5.82	left side
	5.82	right side
target cell	0.00	

**KEYS: Fill in cells in light blue. (D[i] cells aren't necessary but they can help see the adequacy of a design)**

- The W18 value is the value obtained in the bright yellow cell in ESALCALC.xls, the ESAL calculator.
- Subgrade resilient modulus.  
Gravels 10,000-12,000 psi  
Tills 10,000 psi  
Sands 7500-10000 psi  
Silt 6000-7500 psi  
Clays 4000-6000 psi  
<---- this value should be used unless there is clear information to use something (low end for silty/clayey sands, high end for gravelly sands)

- Reliability should be 95% for Interstates, Expwys, 90% elsewhere.

- Terminal serviceability should be 2.5, but collectors and local roads may use 2.0.

The remaining inputs, Std Dev and Z<sub>r</sub> should not be varied from defaults.

D[i] Depth of each layer being constructed. This is not related to the required SN but rather to the provided SN. It is not necessary except to check the adequacy of the design. For rehabilitation, existing layers will have different coefficients. That calculation needs to be done separately but is straightforward. (depth x coeff, add layers).

### Instructions

- If the Excel-> Add-ins-> Solver has not been activated, do that first. (Excel 2003: Tools->Add-ins, check the Solver option)  
In Excel 2010, it's File->Options->Add-ins->click on [Go...] Button at the bottom by "Manage Excel Add-ins", then select Solver Add-In in the dialog box that opens, click OK.

### 2. Fill in the values for the cells in light blue for reconstruction (all new layers).

It is not necessary to fill in these values here. Filling them in allows the labeling of "Adequate" in yellow. This is a quick shortcut for reconstructed pavement. For rehabilitation, please check the value in B16 against the result of filling in the table in the SN eff tab (next Excel tab). The value in B16 gets carried onto that tab, so once the Solver has been run (step 3) you can move over to the SN eff tab to do those calculations.

- Open the Solver (Tools->Solver). Cell B20 should already be the target cell. "By Changing" should be "sn" (B16).

In Excel 2010, it's in the [Data] tab at the top toolbar, then under the "Analysis" category at the far right top, there is the "Solver" option. Click it. It is already set up to run in the appropriate cell with the appropriate values. Click OK and then "Keep Solver Solution".

- The structure provided is adequate when the provided SN exceeds the required SN (and is indicated on cell C16).

You may use either the a[i] and D[i] rows here for the provided SN or you may use the next tab (SN eff). If you use the next sheet, do not change the Provided SN in the green cell because it will override the formula.

### NOTE:

Disclaimer: No claims of accuracy are made about the answers provided by this tool.

This tool calculates the required SN. The Provided SN depends on whether this is new construction or a rehabilitation. Please see the AASHTO 1993 Pavement Design Guide for guidance on rehabilitation design as well as calculations for ESALs. (There are some calculators online, too).

Please note that the structural coefficient of the base layer (0.34) is a function of its position within the pavement structure and not necessarily material properties. It was derived from empirical relationships at the AASHTO Road Test and therefore a hot-mix-asphalt base should be considered at 0.34 per inch and not 0.44 per inch.



## **Appendix A**

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**Boring Logs**

**Pavement Core Photographs**

**BORING INFORMATION**

LOCATION: Chestnut Hill Rd. near Madison Ave.

GROUND SURFACE EL. (ft): NM

VERTICAL DATUM:

TOTAL DEPTH (ft): 6.8

LOGGED BY: S. Cote

DATE START/END: 6/7/2017 - 6/7/2017

DRILLING COMPANY: General Borings, Inc.

DRILLER NAME: T. McGovern

RIG TYPE: Mobile B-57 Truck

**BORING****B-1**

PAGE 1 of 1

**DRILLING INFORMATION**

HAMMER TYPE: Safety Hammer - spooling winch

CASING I.D./O.D.: NA/ NA

CORE BARREL TYPE:

AUGER I.D./O.D.: NA / NA

DRILL ROD O.D.: NM

CORE BARREL I.D./O.D. NA / NA

DRILLING METHOD: Open Hole

WATER LEVEL DEPTHS (ft): Not encountered

**ABBREVIATIONS:**

Pen. = Penetration Length  
 Rec. = Recovery Length  
 RQD = Rock Quality Designation  
 = Length of Sound Cores > 4 in / Pen., %  
 WOR = Weight of Rods  
 WOH = Weight of Hammer

S = Split Spoon Sample  
 C = Core Sample  
 U = Undisturbed Sample  
 SC = Sonic Core  
 DP = Direct Push Sample  
 HSA = Hollow-Stem Auger

Qp = Pocket Penetrometer Strength  
 Sv = Pocket Torvane Shear Strength  
 LL = Liquid Limit  
 PI = Plasticity Index  
 PID = Photoionization Detector  
 I.D./O.D. = Inside Diameter/Outside Diameter

NA, NM = Not Applicable, Not Measured  
 Blows per 6 in.: 140-lb hammer falling  
 30 inches to drive a 2-inch-O.D.  
 split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information				Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		Sample No.	Depth (ft)	Pen./ Rec. (in)	Blows per 6 in. or RQD			
							PAVE	8" ASPHALT. 2" GRAVEL BASE.
		S1	0.8 to 2.8	24/12	24-41- 37-49		SAND & GRAVEL	S1: WIDELY GRADED SAND (SW); 72% fine to coarse sand, 18% fine to medium gravel (up to 1"), 10% silt, light brown, dry.
		S2	2.8 to 4.8	24/10	29-23- 24-55			S2: WIDELY GRADED SAND WITH GRAVEL (SW); ~60% fine to coarse sand, ~35% fine to coarse gravel (up to 1.25"), ~5% silt, brown, moist.
		S3	4.8 to 6.8	24/10	35-51- 46-62			S3: SIMILAR TO S2.
								Bottom of boring at depth 6.8 ft. Hole backfilled with cuttings and patched with cold patch asphalt.

**NOTES:**

PROJECT NAME: Chestnut Hill Road Improvements

CITY/STATE: Trumbull, Connecticut

GEI PROJECT NUMBER: 1702527



**BORING INFORMATION**

LOCATION: Chestnut Hill Rd. near Chatfield Dr.

GROUND SURFACE EL. (ft): NM

VERTICAL DATUM:

TOTAL DEPTH (ft): 6.4

LOGGED BY: S. Cote

DATE START/END: 6/7/2017 - 6/7/2017

DRILLING COMPANY: General Borings, Inc.

DRILLER NAME: T. McGovern

RIG TYPE: Mobile B-57 Truck

**BORING****B-2**

PAGE 1 of 1

**DRILLING INFORMATION**

HAMMER TYPE: Safety Hammer - spooling winch

CASING I.D./O.D.: NA/ NA

CORE BARREL TYPE:

AUGER I.D./O.D.: NA / NA

DRILL ROD O.D.: NM

CORE BARREL I.D./O.D. NA / NA

DRILLING METHOD: Open Hole

WATER LEVEL DEPTHS (ft): Not encountered

**ABBREVIATIONS:** Pen. = Penetration Length  
 Rec. = Recovery Length  
 RQD = Rock Quality Designation  
 = Length of Sound Cores > 4 in / Pen., %  
 WOR = Weight of Rods  
 WOH = Weight of Hammer

S = Split Spoon Sample  
 C = Core Sample  
 U = Undisturbed Sample  
 SC = Sonic Core  
 DP = Direct Push Sample  
 HSA = Hollow-Stem Auger

Qp = Pocket Penetrometer Strength  
 Sv = Pocket Torvane Shear Strength  
 LL = Liquid Limit  
 PI = Plasticity Index  
 PID = Photoionization Detector  
 I.D./O.D. = Inside Diameter/Outside Diameter

NA, NM = Not Applicable, Not Measured  
 Blows per 6 in.: 140-lb hammer falling  
 30 inches to drive a 2-inch-O.D.  
 split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information				Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		Sample No.	Depth (ft)	Pen./ Rec. (in)	Blows per 6 in. or RQD			
							PAVE	5" ASPHALT
		S1	0.4 to 2.4	24/14	31-32-42-35		SAND & GRAVEL	S1: WIDELY GRADED SAND WITH GRAVEL (SW); ~60% fine to coarse sand, ~30% fine to medium gravel (up to 3/4"), ~10% silt, gray/brown, dry.
		S2	2.4 to 4.4	24/12	32-20-19-13			S2: WIDELY GRADED SAND WITH GRAVEL (SW); ~70% fine to coarse sand, ~20% fine to medium gravel (up to 3/4"), ~10% silt, brown, moist.
		S3	4.4 to 6.4	24/7	12-13-12-10			S3: WIDELY GRADED SAND (SW); ~85% fine to coarse sand, ~10% silt, ~5% fine gravel (up to 1/4"), brown, moist.
								Bottom of boring at depth 6.4 ft. Hole backfilled with cuttings and patched with cold patch asphalt.

**NOTES:**

PROJECT NAME: Chestnut Hill Road Improvements

CITY/STATE: Trumbull, Connecticut

GEI PROJECT NUMBER: 1702527



**BORING INFORMATION**

LOCATION: Chestnut Hill Rd. b/t Killian &amp; Candlewood

GROUND SURFACE EL. (ft): NM

VERTICAL DATUM:

TOTAL DEPTH (ft): 7.5

LOGGED BY: S. Cote

DATE START/END: 6/7/2017 - 6/7/2017

DRILLING COMPANY: General Borings, Inc.

DRILLER NAME: T. McGovern

RIG TYPE: Mobile B-57 Truck

**BORING****B-3**

PAGE 1 of 1

**DRILLING INFORMATION**

HAMMER TYPE: Safety Hammer - spooling winch

CASING I.D./O.D.: NA/ NA

CORE BARREL TYPE:

AUGER I.D./O.D.: 2 inch / 2.25 inch

DRILL ROD O.D.: NM

CORE BARREL I.D./O.D. NA / NA

DRILLING METHOD: Auger

WATER LEVEL DEPTHS (ft): Not encountered

**ABBREVIATIONS:**

Pen. = Penetration Length  
 Rec. = Recovery Length  
 RQD = Rock Quality Designation  
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 WOR = Weight of Rods  
 WOH = Weight of Hammer

S = Split Spoon Sample  
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 DP = Direct Push Sample  
 HSA = Hollow-Stem Auger

Qp = Pocket Penetrometer Strength  
 Sv = Pocket Torvane Shear Strength  
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 I.D./O.D. = Inside Diameter/Outside Diameter

NA, NM = Not Applicable, Not Measured  
 Blows per 6 in.: 140-lb hammer falling  
 30 inches to drive a 2-inch-O.D.  
 split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information				Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		Sample No.	Depth (ft)	Pen./ Rec. (in)	Blows per 6 in. or RQD			
							PAVE	8" ASPHALT
		S1	0.7 to 2.7	24/10	9-5-5-6		FILL	S1: SILTY SAND (SM); 50% fine to coarse sand, 37% silt, 13% fine gravel, gray, moist to wet.
		S2	2.7 to 4.7	24/11	4-6-17-51			S2 (2.7-3.7'): SIMILAR TO S1.
	5	S3	4.7 to 5.7	12/9	42-106	Increased resistance/ auger grinding from 5ft. to 7.5ft.	SAND & GRAVEL	S2 (3.7-4.7'): WIDELY GRADED SAND WITH GRAVEL (SW); ~60% fine to coarse sand, ~30% fine to coarse gravel (up to 2"), ~10% silt, orange/brown, moist. Contains cobble fragments.  S3: WIDELY GRADED SAND WITH GRAVEL (SW); ~60% fine to coarse sand, ~35% fine to coarse gravel (up to 1"), ~5% silt, brown, moist. Contains cobble fragments.
								Bottom of boring at depth 7.5 ft. Hole backfilled with cuttings and patched with cold patch asphalt.

**NOTES:**

PROJECT NAME: Chestnut Hill Road Improvements

CITY/STATE: Trumbull, Connecticut

GEI PROJECT NUMBER: 1702527



**BORING INFORMATION**

LOCATION: Chestnut Hill Rd. near Samuel St.

GROUND SURFACE EL. (ft): NM

VERTICAL DATUM:

TOTAL DEPTH (ft): 6.5

LOGGED BY: S. Cote

DATE START/END: 6/7/2017 - 6/7/2017

DRILLING COMPANY: General Borings, Inc.

DRILLER NAME: T. McGovern

RIG TYPE: Mobile B-57 Truck

**BORING****B-4**

PAGE 1 of 1

**DRILLING INFORMATION**

HAMMER TYPE: Safety Hammer - spooling winch

CASING I.D./O.D.: NA / NA

CORE BARREL TYPE:

AUGER I.D./O.D.: NA / NA

DRILL ROD O.D.: NM

CORE BARREL I.D./O.D. NA / NA

DRILLING METHOD: Open Hole

WATER LEVEL DEPTHS (ft): Not encountered

**ABBREVIATIONS:**

Pen. = Penetration Length  
 Rec. = Recovery Length  
 RQD = Rock Quality Designation  
 = Length of Sound Cores > 4 in / Pen., %  
 WOR = Weight of Rods  
 WOH = Weight of Hammer

S = Split Spoon Sample  
 C = Core Sample  
 U = Undisturbed Sample  
 SC = Sonic Core  
 DP = Direct Push Sample  
 HSA = Hollow-Stem Auger

Qp = Pocket Penetrometer Strength  
 Sv = Pocket Torvane Shear Strength  
 LL = Liquid Limit  
 PI = Plasticity Index  
 PID = Photoionization Detector  
 I.D./O.D. = Inside Diameter/Outside Diameter

NA, NM = Not Applicable, Not Measured  
 Blows per 6 in.: 140-lb hammer falling  
 30 inches to drive a 2-inch-O.D.  
 split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information				Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		Sample No.	Depth (ft)	Pen./ Rec. (in)	Blows per 6 in. or RQD			
							PAVE	6" ASPHALT.
		S1	0.5 to 2.5	24/3	20-14- 12-10		FILL	S1: WIDELY GRADED SAND WITH GRAVEL (SW); 45% fine to coarse sand, 43% fine gravel, 13% silt, gray, moist.
		S2	2.5 to 4.5	24/2	8-8-3-3		SAND & GRAVEL	S2: WIDELY GRADED SAND (SW); ~90% fine to coarse sand, ~10% silt, light brown, moist.
		S3	4.5 to 6.5	24/0	3-7-4-6			S3: No sample recovery (gravel in sampler)
								Bottom of boring at depth 6.5 ft. Hole backfilled with cuttings and patched with cold patch asphalt.

**NOTES:**

PROJECT NAME: Chestnut Hill Road Improvements

CITY/STATE: Trumbull, Connecticut

GEI PROJECT NUMBER: 1702527



**BORING INFORMATION**

LOCATION: Chestnut Hill Rd. b/t Samuel &amp; Francis St.

GROUND SURFACE EL. (ft): NM

VERTICAL DATUM:

TOTAL DEPTH (ft): 6.8

LOGGED BY: S. Cote

DATE START/END: 6/7/2017 - 6/7/2017

DRILLING COMPANY: General Borings, Inc.

DRILLER NAME: T. McGovern

RIG TYPE: Mobile B-57 Truck

**BORING****B-5**

PAGE 1 of 1

**DRILLING INFORMATION**

HAMMER TYPE: Safety Hammer - spooling winch

CASING I.D./O.D.: NA/ NA

CORE BARREL TYPE:

AUGER I.D./O.D.: NA / NA

DRILL ROD O.D.: NM

CORE BARREL I.D./O.D. NA / NA

DRILLING METHOD: Open Hole

WATER LEVEL DEPTHS (ft): Not encountered

**ABBREVIATIONS:**

Pen. = Penetration Length  
 Rec. = Recovery Length  
 RQD = Rock Quality Designation  
 = Length of Sound Cores > 4 in / Pen., %  
 WOR = Weight of Rods  
 WOH = Weight of Hammer

S = Split Spoon Sample  
 C = Core Sample  
 U = Undisturbed Sample  
 SC = Sonic Core  
 DP = Direct Push Sample  
 HSA = Hollow-Stem Auger

Qp = Pocket Penetrometer Strength  
 Sv = Pocket Torvane Shear Strength  
 LL = Liquid Limit  
 PI = Plasticity Index  
 PID = Photoionization Detector  
 I.D./O.D. = Inside Diameter/Outside Diameter

NA, NM = Not Applicable, Not Measured  
 Blows per 6 in.: 140-lb hammer falling  
 30 inches to drive a 2-inch-O.D.  
 split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information				Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		Sample No.	Depth (ft)	Pen./ Rec. (in)	Blows per 6 in. or RQD			
							PAVE	8" ASPHALT. 2" GRAVEL BASE.
		S1	0.8 to 2.8	24/16	27-30- 31-45		GLACIAL TILL	S1: WIDELY GRADED SAND WITH GRAVEL (SW); ~70% fine to coarse sand, ~25% fine to medium gravel (up to 3/4"), ~5% silt, light brown, dry.
		S2	2.8 to 4.8	24/18	51-40- 49-56			S2: SIMILAR TO S1.
5		S3	4.8 to 6.8	24/16	49-58- 53-89			S3: WIDELY GRADED SAND WITH GRAVEL (SW); ~70% fine to coarse sand, ~25% fine to medium gravel (up to 3/4"), ~5% silt, light brown, dry. Contains cobble fragments.
								Bottom of boring at depth 6.8 ft. Hole backfilled with cuttings and patched with cold patch asphalt.

**NOTES:**

PROJECT NAME: Chestnut Hill Road Improvements

CITY/STATE: Trumbull, Connecticut

GEI PROJECT NUMBER: 1702527



**BORING INFORMATION**

LOCATION: Chestnut Hill Rd. west of Francis St.

GROUND SURFACE EL. (ft): NM

VERTICAL DATUM:

TOTAL DEPTH (ft): 7.0

LOGGED BY: S. Cote

DATE START/END: 6/7/2017 - 6/7/2017

DRILLING COMPANY: General Borings, Inc.

DRILLER NAME: T. McGovern

RIG TYPE: Mobile B-57 Truck

**BORING****B-6**

PAGE 1 of 1

**DRILLING INFORMATION**

HAMMER TYPE: Safety Hammer - spooling winch

CASING I.D./O.D.: NA/ NA

CORE BARREL TYPE:

AUGER I.D./O.D.: 2 inch / 2.25 inch

DRILL ROD O.D.: NM

CORE BARREL I.D./O.D. NA / NA

DRILLING METHOD: Auger

WATER LEVEL DEPTHS (ft): Not encountered

**ABBREVIATIONS:**

Pen. = Penetration Length  
 Rec. = Recovery Length  
 RQD = Rock Quality Designation  
 = Length of Sound Cores > 4 in / Pen., %  
 WOR = Weight of Rods  
 WOH = Weight of Hammer

S = Split Spoon Sample  
 C = Core Sample  
 U = Undisturbed Sample  
 SC = Sonic Core  
 DP = Direct Push Sample  
 HSA = Hollow-Stem Auger

Qp = Pocket Penetrometer Strength  
 Sv = Pocket Torvane Shear Strength  
 LL = Liquid Limit  
 PI = Plasticity Index  
 PID = Photoionization Detector  
 I.D./O.D. = Inside Diameter/Outside Diameter

NA, NM = Not Applicable, Not Measured  
 Blows per 6 in.: 140-lb hammer falling  
 30 inches to drive a 2-inch-O.D.  
 split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information				Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		Sample No.	Depth (ft)	Pen./ Rec. (in)	Blows per 6 in. or RQD			
							PAVE	7" ASPHALT. 2" GRAVEL BASE.
		S1	0.8 to 2.8	24/5	10-37- 28-25		FILL	S1: SILTY SAND (SM); 59% fine to medium sand, 31% silt, 10% fine gravel, dark gray, moist.
		S2	2.8 to 4.8	24/3	19-21- 25-26		GLACIAL TILL	S2: WIDELY GRADED SAND WITH GRAVEL (SW); ~75% fine to coarse sand, ~15% fine gravel, ~10% silt, brown, wet.
5		S3	4.8 to 5.7	11/3	35- 100/5"			S3: WIDELY GRADED SAND (SW); ~90% fine to coarse sand, ~10% silt, brown, wet.
						Auger grinding through cobble from ~5.5ft. to ~6ft.		
								Bottom of boring at depth 7 ft. Hole backfilled with cuttings and patched with cold patch asphalt.

**NOTES:**

PROJECT NAME: Chestnut Hill Road Improvements

CITY/STATE: Trumbull, Connecticut

GEI PROJECT NUMBER: 1702527



**BORING INFORMATION**

LOCATION: Chestnut Hill Rd. east of Francis St.

GROUND SURFACE EL. (ft): NM

VERTICAL DATUM:

TOTAL DEPTH (ft): 6.6

LOGGED BY: S. Cote

DATE START/END: 6/7/2017 - 6/7/2017

DRILLING COMPANY: General Borings, Inc.

DRILLER NAME: T. McGovern

RIG TYPE: Mobile B-57 Truck

**BORING****B-7**

PAGE 1 of 1

**DRILLING INFORMATION**

HAMMER TYPE: Safety Hammer - spooling winch

CASING I.D./O.D.: NA / NA

CORE BARREL TYPE:

AUGER I.D./O.D.: NA / NA

DRILL ROD O.D.: NM

CORE BARREL I.D./O.D. NA / NA

DRILLING METHOD: Open Hole

WATER LEVEL DEPTHS (ft): Not encountered

**ABBREVIATIONS:**

Pen. = Penetration Length  
 Rec. = Recovery Length  
 RQD = Rock Quality Designation  
 = Length of Sound Cores > 4 in / Pen., %  
 WOR = Weight of Rods  
 WOH = Weight of Hammer

S = Split Spoon Sample  
 C = Core Sample  
 U = Undisturbed Sample  
 SC = Sonic Core  
 DP = Direct Push Sample  
 HSA = Hollow-Stem Auger

Qp = Pocket Penetrometer Strength  
 Sv = Pocket Torvane Shear Strength  
 LL = Liquid Limit  
 PI = Plasticity Index  
 PID = Photoionization Detector  
 I.D./O.D. = Inside Diameter/Outside Diameter

NA, NM = Not Applicable, Not Measured  
 Blows per 6 in.: 140-lb hammer falling  
 30 inches to drive a 2-inch-O.D.  
 split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information				Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		Sample No.	Depth (ft)	Pen./ Rec. (in)	Blows per 6 in. or RQD			
							PAVE	4" ASPHALT. 3" GRAVEL BASE.
		S1	0.6 to 2.6	24/15	29-45- 25-22		GLACIAL TILL	S1: SILTY SAND (SM); ~75% fine to coarse sand, ~15% silt, ~10% fine to coarse gravel (up to 1"), orange-brown, moist.
		S2	2.6 to 4.6	24/15	24-18- 15-17			S2: SILTY SAND (SM); ~85% fine to medium sand, ~15% silt, gray/brown, moist.
	5	S3	4.6 to 6.6	24/20	18-14- 16-20			S3: WIDELY GRADED SAND (SW); ~80% fine to coarse sand, ~10% silt, ~10% fine to medium gravel, gray/brown, moist.
								Bottom of boring at depth 6.6 ft. Hole backfilled with cuttings and patched with cold patch asphalt.

**NOTES:**

PROJECT NAME: Chestnut Hill Road Improvements

CITY/STATE: Trumbull, Connecticut

GEI PROJECT NUMBER: 1702527





**BORING INFORMATION**

LOCATION: Chestnut Hill Rd. east of Parkway Dr.

GROUND SURFACE EL. (ft): NM

VERTICAL DATUM:

TOTAL DEPTH (ft): 7.0

LOGGED BY: S. Cote

DATE START/END: 6/7/2017 - 6/7/2017

DRILLING COMPANY: General Borings, Inc.

DRILLER NAME: T. McGovern

RIG TYPE: Mobile B-57 Truck

**BORING****B-8**

PAGE 1 of 1

**DRILLING INFORMATION**

HAMMER TYPE: Safety Hammer - spooling winch

CASING I.D./O.D.: NA/ NA

CORE BARREL TYPE:

AUGER I.D./O.D.: NA / NA

DRILL ROD O.D.: NM

CORE BARREL I.D./O.D. NA / NA

DRILLING METHOD: Open Hole

WATER LEVEL DEPTHS (ft): Not encountered

**ABBREVIATIONS:** Pen. = Penetration Length  
 Rec. = Recovery Length  
 RQD = Rock Quality Designation  
 = Length of Sound Cores > 4 in / Pen., %  
 WOR = Weight of Rods  
 WOH = Weight of Hammer

S = Split Spoon Sample  
 C = Core Sample  
 U = Undisturbed Sample  
 SC = Sonic Core  
 DP = Direct Push Sample  
 HSA = Hollow-Stem Auger

Qp = Pocket Penetrometer Strength  
 Sv = Pocket Torvane Shear Strength  
 LL = Liquid Limit  
 PI = Plasticity Index  
 PID = Photoionization Detector  
 I.D./O.D. = Inside Diameter/Outside Diameter

NA, NM = Not Applicable, Not Measured  
 Blows per 6 in.: 140-lb hammer falling  
 30 inches to drive a 2-inch-O.D.  
 split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information				Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		Sample No.	Depth (ft)	Pen./ Rec. (in)	Blows per 6 in. or RQD			
							PAVE	7" ASPHALT. 4" GRAVEL BASE.
		S1	1 to 3	24/3	10-17- 15-19		GLACIAL TILL	S1: SILTY SAND WITH GRAVEL (SM); 40% fine to coarse sand, 36% fine to coarse gravel (up to 1"), 24% silt, gray, wet.
		S2	3 to 5	24/0	14-10-9- 8			S2: No sample recovery.
	5	S3	5 to 7	24/23	10-4-3-4			S3: SILTY SAND (SM); ~70% fine to coarse sand, ~20% silt, ~10% fine to coarse gravel (up to 1"), gray, wet.
								Bottom of boring at depth 7 ft. Hole backfilled with cuttings and patched with cold patch asphalt.

**NOTES:**

PROJECT NAME: Chestnut Hill Road Improvements

CITY/STATE: Trumbull, Connecticut

GEI PROJECT NUMBER: 1702527



**BORING INFORMATION**

LOCATION: Chestnut Hill Rd. west of Chatfield Dr.

GROUND SURFACE EL. (ft): NM

VERTICAL DATUM:

TOTAL DEPTH (ft): 7.0

LOGGED BY: S. Cote

DATE START/END: 6/7/2017 - 6/7/2017

DRILLING COMPANY: General Borings, Inc.

DRILLER NAME: T. McGovern

RIG TYPE:

**BORING****B-9**

PAGE 1 of 1

**DRILLING INFORMATION**

HAMMER TYPE:

CASING I.D./O.D.: NA / NA

CORE BARREL TYPE:

AUGER I.D./O.D.: NA / NA

DRILL ROD O.D.: NM

CORE BARREL I.D./O.D. NA / NA

DRILLING METHOD:

WATER LEVEL DEPTHS (ft): Not encountered

**ABBREVIATIONS:**

Pen. = Penetration Length  
 Rec. = Recovery Length  
 RQD = Rock Quality Designation  
 = Length of Sound Cores > 4 in / Pen., %  
 WOR = Weight of Rods  
 WOH = Weight of Hammer

S = Split Spoon Sample  
 C = Core Sample  
 U = Undisturbed Sample  
 SC = Sonic Core  
 DP = Direct Push Sample  
 HSA = Hollow-Stem Auger

Qp = Pocket Penetrometer Strength  
 Sv = Pocket Torvane Shear Strength  
 LL = Liquid Limit  
 PI = Plasticity Index  
 PID = Photoionization Detector  
 I.D./O.D. = Inside Diameter/Outside Diameter

NA, NM = Not Applicable, Not Measured  
 Blows per 6 in.: 140-lb hammer falling  
 30 inches to drive a 2-inch-O.D.  
 split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information				Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		Sample No.	Depth (ft)	Pen./ Rec. (in)	Blows per 6 in. or RQD			
							PAVE	8" ASPHALT. 4" GRAVEL BASE.
		S1	1 to 3	24/12	15-18-6- 7		SAND & GRAVEL	S1: SILTY SAND (SM); ~80% fine to medium sand, ~20% silt, orange-brown, moist.
		S2	3 to 5	24/11	9-10-7- 10			S2: NARROWLY GRADED SAND (SP); ~100% fine to medium sand, tan, dry.
	5	S3	5 to 7	24/14	20-22- 51-88			S3: WIDELY GRADED SAND WITH GRAVEL (SW); ~65% fine to coarse sand, ~30% gravel (up to 1"), ~5% silt, tan to light gray, dry. Contains cobble fragments.
								Bottom of boring at depth 7 ft. Hole backfilled with cuttings and patched with cold patch asphalt.

**NOTES:**

PROJECT NAME: Chestnut Hill Road Improvements

CITY/STATE: Trumbull, Connecticut

GEI PROJECT NUMBER: 1702527



GEI Consultants, Inc.  
**PAVEMENT CORING PHOTOGRAPHS 2 OF 3**  
**CHESTNUT HILL ROAD TRUMBULL, CT**



**Boring Location:** B-05  
**Photographer:** S. Cote on 6/7/17



**Boring Location:** B-06  
**Photographer:** S. Cote on 6/7/17



**Boring Location:** B-07  
**Photographer:** S. Cote on 6/7/17

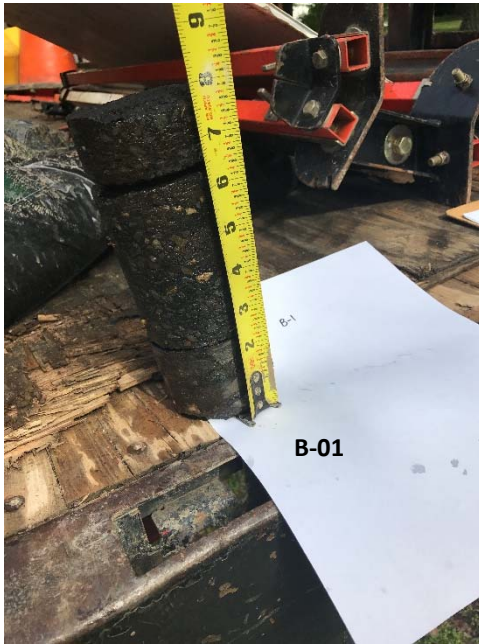


**Boring Location:** B-08  
**Photographer:** S. Cote on 6/7/17





GEI Consultants, Inc.  
**PAVEMENT CORING PHOTOGRAPHS 1 OF 3**  
**CHESTNUT HILL ROAD TRUMBULL, CT**



**Boring Location:** B-01  
**Photographer:** S. Cote on 6/7/17



**Boring Location:** B-02  
**Photographer:** S. Cote on 6/7/17



**Boring Location:** B-03  
**Photographer:** S. Cote on 6/7/17



**Boring Location:** B-04  
**Photographer:** S. Cote on 6/7/17



GEI Consultants, Inc.  
**PAVEMENT CORING PHOTOGRAPHS 3 OF 3**  
**CHESTNUT HILL ROAD TRUMBULL, CT**



**Boring Location:** B-09

**Photographer:** S. Cote on 6/7/17

## Appendix B

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### Laboratory Test Results



Client:	GEI Consultants, Inc.		Project No:	GTX-306586
Project:	Chestnut Hill Road			
Location:	Trumbull, CT			
Boring ID:	---	Sample Type:	---	Tested By: jbr
Sample ID:	---	Test Date:	06/15/17	Checked By: jdt
Depth :	---	Test Id:	414071	

## Moisture Content of Soil and Rock - ASTM D2216

Boring ID	Sample ID	Depth	Description	Moisture Content, %
B-1	S- 1	0.8-2.8 ft	Moist, dark yellowish brown sand with silt and gravel	10.8
B-3	S- 1	0.7-2.7 ft	Moist, dark grayish brown silty sand	20.9
B-4	S- 1	0.5-2.5 ft	Moist, dark grayish brown silty sand with gravel	9.9
B-6	S- 1	0.75-2.75 ft	Moist, dark grayish brown silty sand	11.5
B-8	S- 1	1-3 ft	Moist, dark grayish brown silty sand with gravel	8.3

Notes: Temperature of Drying : 110° Celsius

Client: GEI Consultants, Inc.  
Project: Chestnut Hill Road  
Location: Trumbull, CT

Project No: GTX-306586

Boring ID: B-1

Sample Type: bag

Tested By: jbr

Sample ID: S-1

Test Date: 06/16/17

Checked By: jdt

Depth: 0.8-2.8 ft

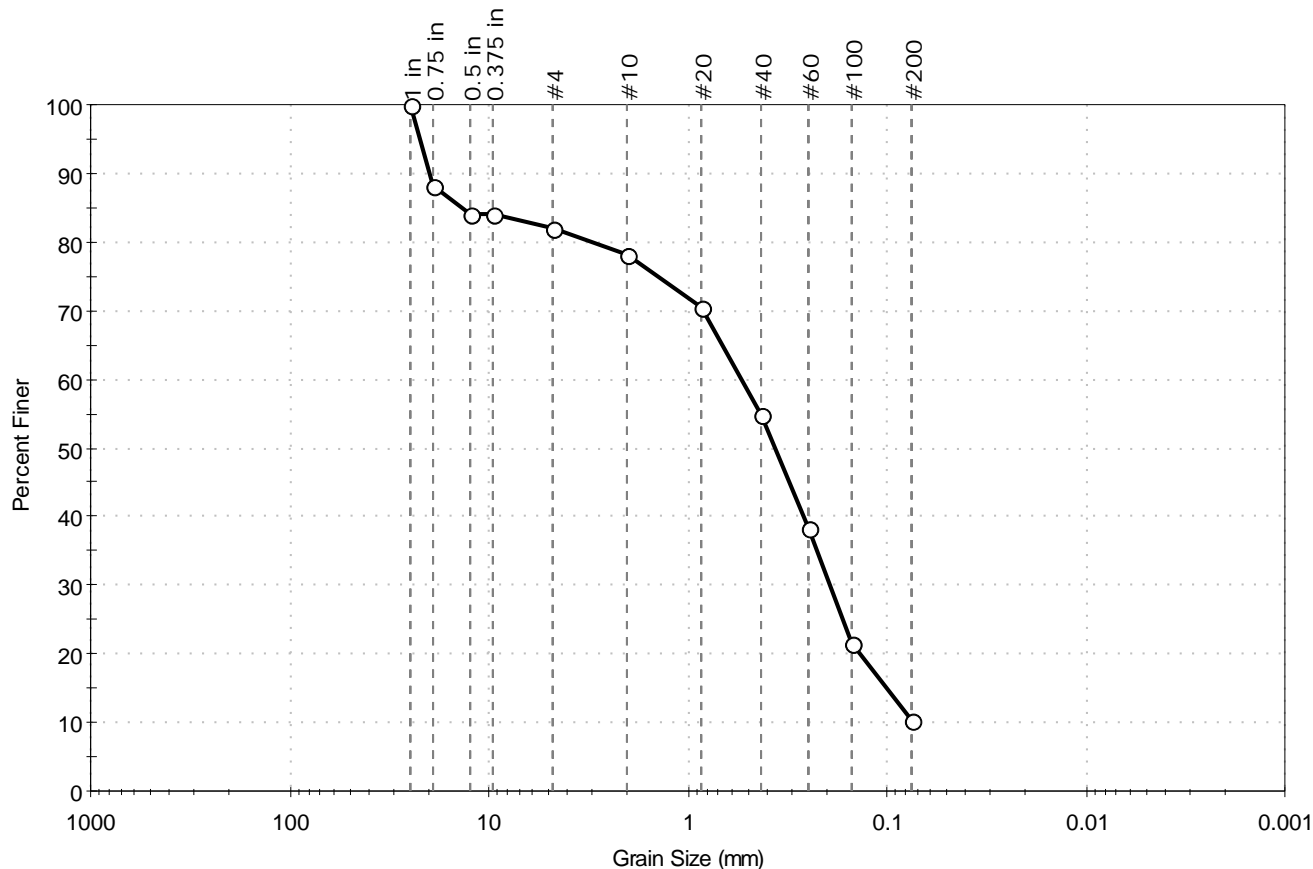
Test Id: 414067

Test Comment: ---

Visual Description: Moist, dark yellowish brown sand with silt and gravel

Sample Comment: ---

## Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
---	18.0	71.7	10.3

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
1 in	25.00	100		
0.75 in	19.00	88		
0.5 in	12.50	84		
0.375 in	9.50	84		
#4	4.75	82		
#10	2.00	78		
#20	0.85	70		
#40	0.42	55		
#60	0.25	38		
#100	0.15	22		
#200	0.075	10		

### Coefficients

$D_{85} = 13.9218 \text{ mm}$        $D_{30} = 0.1940 \text{ mm}$   
 $D_{60} = 0.5342 \text{ mm}$        $D_{15} = 0.0999 \text{ mm}$   
 $D_{50} = 0.3640 \text{ mm}$        $D_{10} = \text{N/A}$   
 $C_u = \text{N/A}$        $C_c = \text{N/A}$

### Classification

ASTM N/A

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

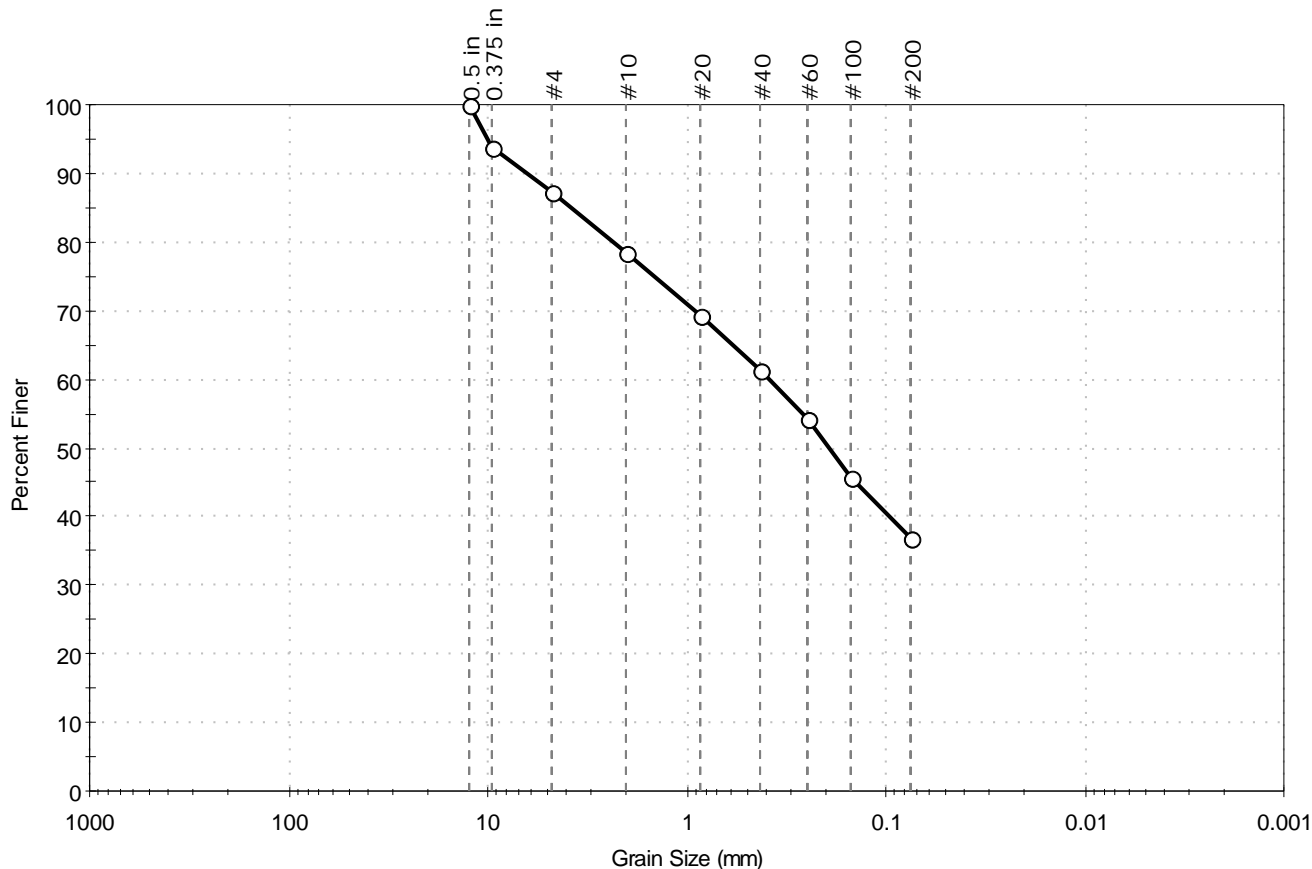
### Sample/Test Description

Sand/Gravel Particle Shape : ANGULAR  
 Sand/Gravel Hardness : HARD



Client: GEI Consultants, Inc.	Project No: GTX-306586	
Project: Chestnut Hill Road		
Location: Trumbull, CT		
Boring ID: B-3	Sample Type: bag	Tested By: jbr
Sample ID: S-1	Test Date: 06/16/17	Checked By: jdt
Depth: 0.7-2.7 ft	Test Id: 414063	
Test Comment: ---		
Visual Description: Moist, dark grayish brown silty sand		
Sample Comment: ---		

## Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
---	12.6	50.6	36.8

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.5 in	12.50	100		
0.375 in	9.50	94		
#4	4.75	87		
#10	2.00	79		
#20	0.85	69		
#40	0.42	61		
#60	0.25	54		
#100	0.15	46		
#200	0.075	37		

### Coefficients

$D_{85} = 3.7658 \text{ mm}$        $D_{30} = \text{N/A}$   
 $D_{60} = 0.3844 \text{ mm}$        $D_{15} = \text{N/A}$   
 $D_{50} = 0.1928 \text{ mm}$        $D_{10} = \text{N/A}$   
 $C_u = \text{N/A}$        $C_c = \text{N/A}$

### Classification

ASTM N/A

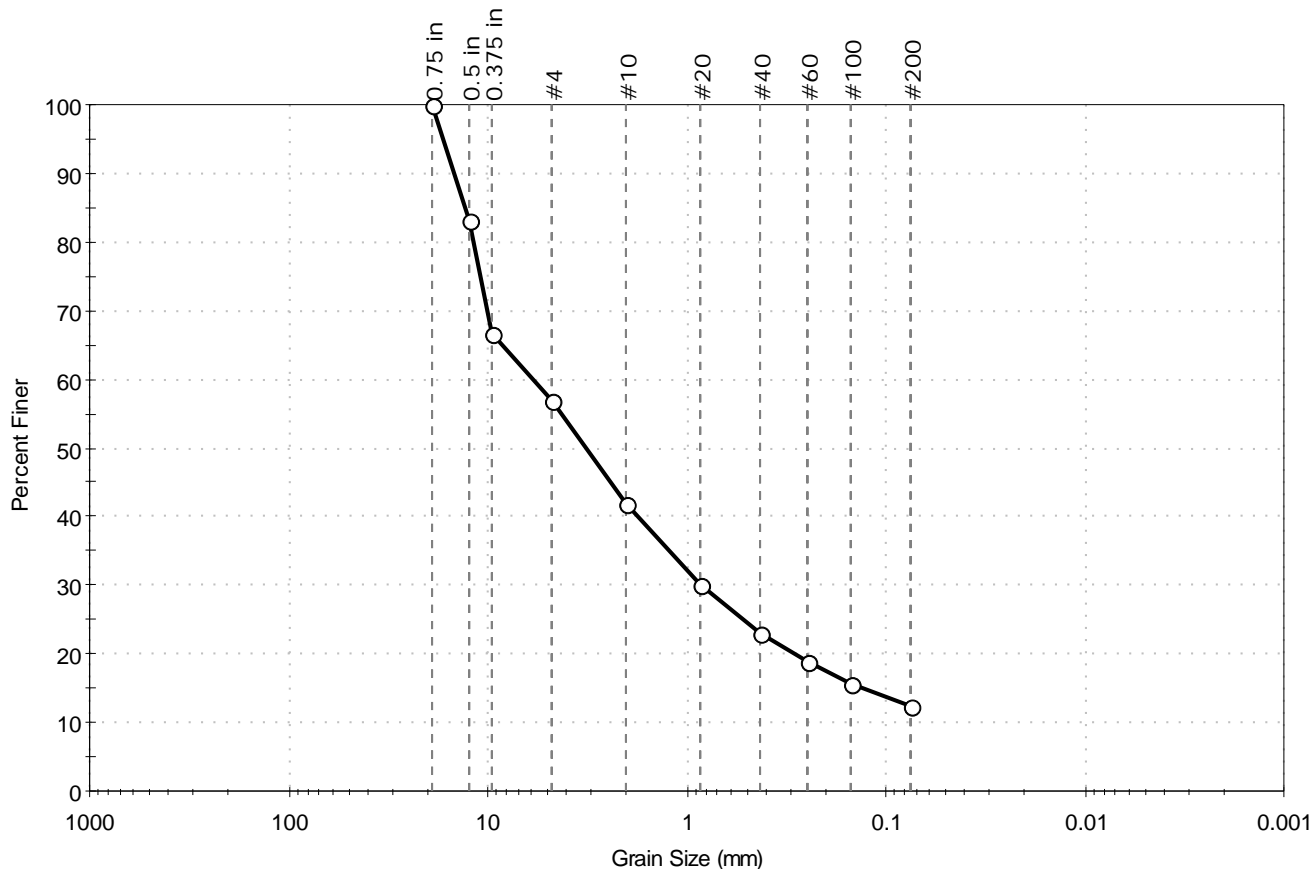
AASHTO Silty Soils (A-4 (0))

### Sample/Test Description

Sand/Gravel Particle Shape : ANGULAR  
 Sand/Gravel Hardness : HARD

Client: GEI Consultants, Inc.	Project No: GTX-306586
Project: Chestnut Hill Road	
Location: Trumbull, CT	
Boring ID: B-4	Sample Type: bag
Sample ID: S-1	Test Date: 06/16/17
Depth: 0.5-2.5 ft	Test Id: 414064
Test Comment: ---	Tested By: jbr
Visual Description: Moist, dark grayish brown silty sand with gravel	Checked By: jdt
Sample Comment: ---	

## Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
---	43.0	44.5	12.5

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.75 in	19.00	100		
0.5 in	12.50	83		
0.375 in	9.50	67		
#4	4.75	57		
#10	2.00	42		
#20	0.85	30		
#40	0.425	23		
#60	0.25	19		
#100	0.15	16		
#200	0.075	12		

### Coefficients

D <sub>85</sub> = 13.0554 mm	D <sub>30</sub> = 0.8441 mm
D <sub>60</sub> = 5.8948 mm	D <sub>15</sub> = 0.1287 mm
D <sub>50</sub> = 3.1831 mm	D <sub>10</sub> = N/A
C <sub>u</sub> = N/A	C <sub>c</sub> = N/A

### Classification

ASTM N/A

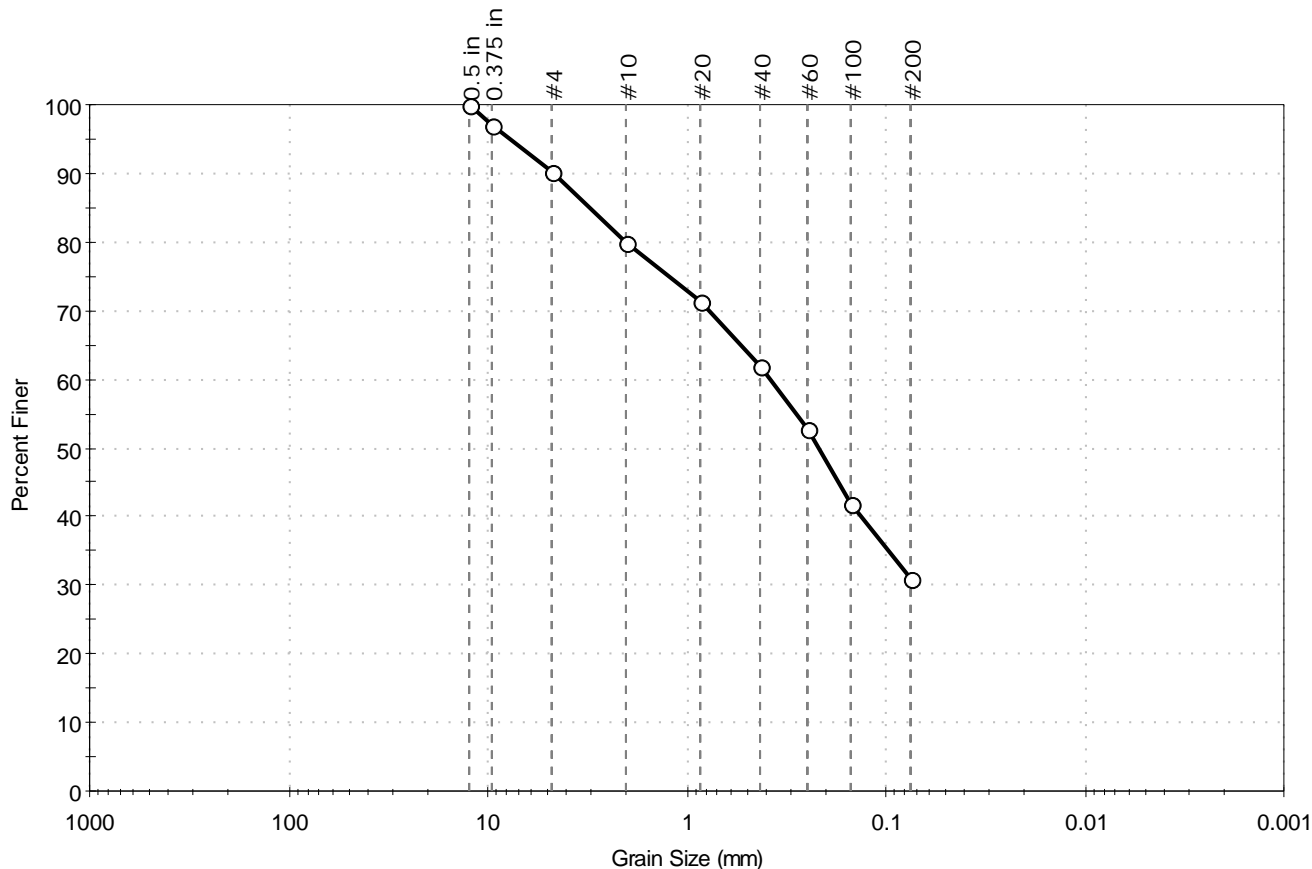
AASHTO Stone Fragments, Gravel and Sand (A-1-a (0))

### Sample/Test Description

Sand/Gravel Particle Shape : ANGULAR  
Sand/Gravel Hardness : HARD

Client: GEI Consultants, Inc.	Project No: GTX-306586	
Project: Chestnut Hill Road		
Location: Trumbull, CT		
Boring ID: B-6	Sample Type: bag	Tested By: jbr
Sample ID: S-1	Test Date: 06/16/17	Checked By: jdt
Depth: 0.75-2.75 ft	Test Id: 414065	
Test Comment: ---		
Visual Description: Moist, dark grayish brown silty sand		
Sample Comment: ---		

## Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
---	9.8	59.2	31.0

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	90		
#10	2.00	80		
#20	0.85	71		
#40	0.42	62		
#60	0.25	53		
#100	0.15	42		
#200	0.075	31		

### Coefficients

$D_{85} = 3.0579 \text{ mm}$        $D_{30} = \text{N/A}$   
 $D_{60} = 0.3802 \text{ mm}$        $D_{15} = \text{N/A}$   
 $D_{50} = 0.2198 \text{ mm}$        $D_{10} = \text{N/A}$   
 $C_u = \text{N/A}$        $C_c = \text{N/A}$

### 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

Client: GEI Consultants, Inc.  
Project: Chestnut Hill Road  
Location: Trumbull, CT

Project No: GTX-306586

Boring ID: B-8

Sample Type: bag

Tested By: jbr

Sample ID: S-1

Test Date: 06/16/17

Checked By: jdt

Depth: 1-3 ft

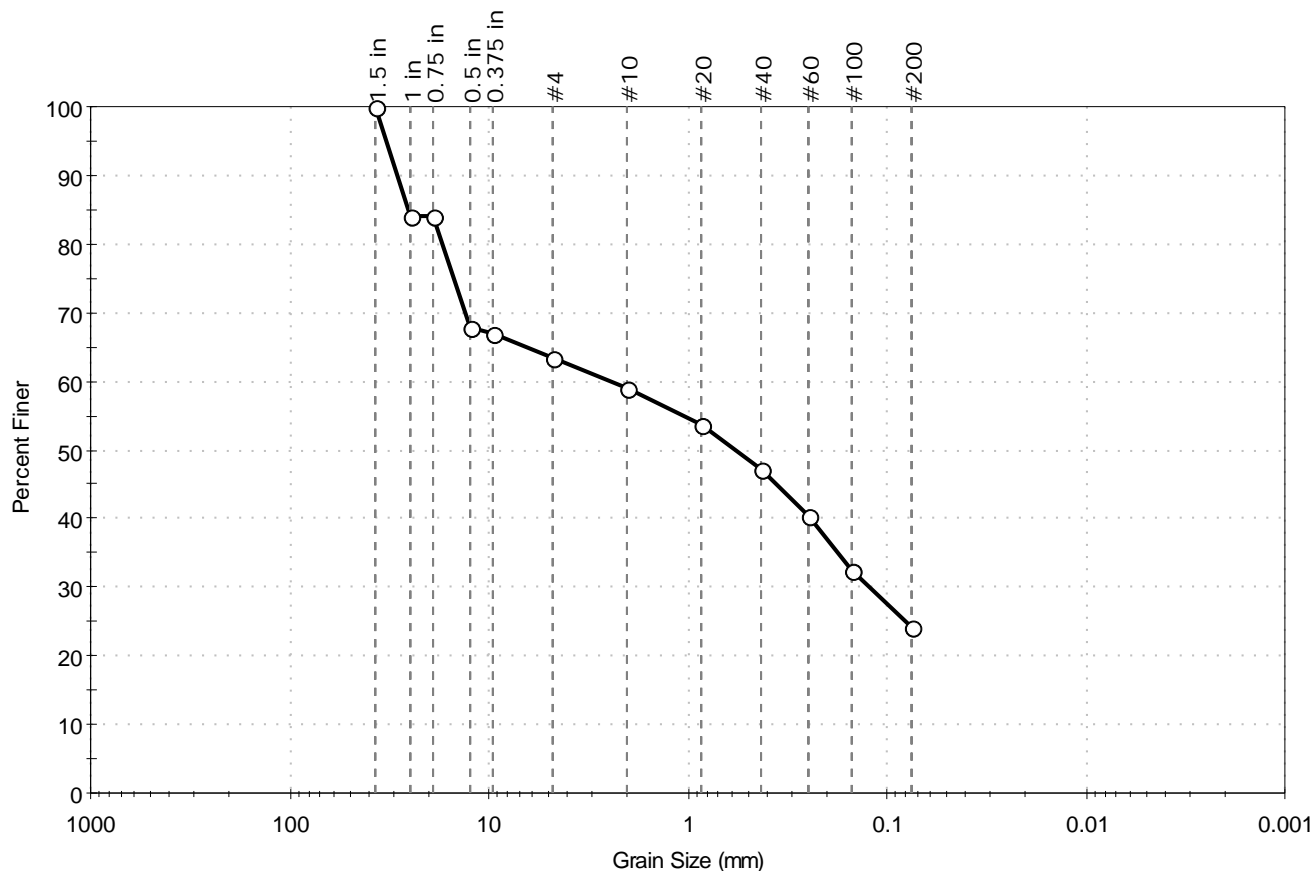
Test Id: 414066

Test Comment: ---

Visual Description: Moist, dark grayish brown silty sand with gravel

Sample Comment: ---

## Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
---	36.4	39.5	24.1

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
1.5 in	37.50	100		
1 in	25.00	84		
0.75 in	19.00	84		
0.5 in	12.50	68		
0.375 in	9.50	67		
#4	4.75	64		
#10	2.00	59		
#20	0.85	54		
#40	0.42	47		
#60	0.25	40		
#100	0.15	32		
#200	0.075	24		

### Coefficients

$D_{85} = 25.5548 \text{ mm}$        $D_{30} = 0.1221 \text{ mm}$   
 $D_{60} = 2.4215 \text{ mm}$        $D_{15} = \text{N/A}$   
 $D_{50} = 0.5695 \text{ mm}$        $D_{10} = \text{N/A}$   
 $C_u = \text{N/A}$        $C_c = \text{N/A}$

### Classification

ASTM N/A

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

### Sample/Test Description

Sand/Gravel Particle Shape : ANGULAR

Sand/Gravel Hardness : HARD