

MEMORANDUM

TO: Kristen Gates, P.E.
The Hanover Company
5847 San Felipe, Suite 3600
Houston, Texas 77057

FROM: Antonio Rodrigues Kevin Martin, P.E.
Field Engineer Geotechnical Engineer



DATE: January 12, 2015

**RE: PRELIMINARY GEOTECHNICAL STUDY
 PROPOSED RESIDENTIAL APARTMENTS
 FISHER STREET
 FOXBOROUGH, MASSACHUSETTS**

Project No. 025.19006.0018

This memorandum serves as a *Preliminary Geotechnical Summary Report* for the referenced project. The contents of this report are subject to the attached **Limitations**.

SITE & PROJECT DESCRIPTION

The project site includes undeveloped woodlands about \approx 18 acres in area. The property includes two (2) lots separated to the east (Business) and west (Residential). Based on review of the *Existing Conditions Plan* (Bay Colony Group - December 2014), site grades gradually to steeply slope downward to the east. Site grades vary from elevation \approx 260-210 ft. Low lying wetlands are delineated along the NE portions of the site near elevation \approx 210-212 ft. Boulders are present throughout the landscape.

The project includes a new residential apartment complex. There are to be five (5), three-story, wood-framed apartment buildings with surrounding pavement and landscape areas. There will also be a clubhouse and pool. It is intended to support the buildings on a conventional spread footing foundation with a concrete floor slab-on-grade (no basement level). *Grading Plans* were not available at the time of this report. Given the sloping contour, some grade alteration is expected for the project.

The purpose of this study is to review the subgrade conditions and provide a geotechnical evaluation related to foundation design and construction as required by the *Massachusetts State Building Code (MSBC)*. This report should be considered preliminary given lack of *Grading Plans*. This report does not include an environmental assessment relative to oil, gasoline, solid waste and/or other hazardous materials. The environmental conditions of the property have been submitted in a separate Phase I ESA report. This study also does not include review of site design or construction issues such as infiltration systems, dry wells, retaining walls, excavation support systems, underground utilities, temporary crane pads, detention ponds, septic systems, steepened slopes, erosion control, protection of surrounding buildings/utilities or other site and/or temporary design unless specifically addressed herein.

SUBSURFACE EXPLORATION & LABORATORY TESTING PROGRAMS

Test Borings by ATC

The subsurface exploration program included the completion of twenty-nine (29) test borings throughout the site. These include B1 to B19 completed within the Building pads as well as P1 to P10 completed in surrounding Pavement areas. The test borings were advanced to refusal depths of about ≈ 5 -16 ft utilizing 4¼-inch continuous flight hollow stem augers. Soil samples were typically retrieved at no greater than 5 ft intervals with a 2-inch diameter split-spoon sampler. Standard Penetration Tests (SPTs) were performed at the sampling intervals in general accordance with ASTM-D1586 (*Standard Method for Penetration Test and Split-Barrel Sampling of Soils*). Field descriptions and penetration resistance of the soils encountered, observed depth to groundwater, depth to apparent bedrock refusal and other pertinent data are contained on the attached *Test Boring Logs*. These locations are illustrated on the *Test Boring Plan*. These locations should be considered very approximate given the limited survey control.

Explorations by Others

We were provided a *Geotechnical Engineering Report* prepared by ESSEX in December 1999. This report was for a prior hotel located within the eastern lot. Seven (7) *Test Bore Logs* were provided for this study. The *Location Plan* was not available to show the test bores.

We were also provided a partial report entitled *Test Pit Results* prepared by HML dated March 2000. This partial report is also limited to the eastern lot and includes several test pits

Laboratory Testing

Fifteen (15) selected split-spoon samples obtained from the test borings were submitted to our laboratory for sieve analyses per ASTM Standards. The purpose of the testing was to assess engineering characteristics for design and to assess the suitability of the site soils for re-use as structural fill on the project. The test results are attached.

SUBGRADE CONDITIONS

The subgrade conditions generally include surface organic laden soils (Topsoil & Subsoil) underlain by a dense Glacial Till, Weathered Rock then apparent Bedrock.

There is about ≈ 2 ft of collective, organic laden soils across the wooded site. This includes about ≈ 6 inches of forest mat and humus underlain by a loamy Subsoil. The Subsoil consists of a rust brown, silty Sand with trace gravel, roots, loam and organic matter as leached from the surface. These soils are also identified as being very loose to loose.

The parent subgrade consists of a compact Glacial Till. The Till is shallow and extends about ≈ 4 -15 ft below grade (typically ≈ 5 -10 ft below grade). The Till consists of a grey to brown, well-graded, fine to medium Sand with some to little gravel and silt. The Till appears to consist of an Ablation Till which is typically more sandy in composition. Occasional cobbles and boulders are embedded in the glacial soils. These soils are stable, dense and compact. Gradation tests indicate a Sand (≈ 45 -60%), some Gravel (≈ 17 -40%), some Silt (≈ 20 -40%). The fine-grained composition of the Till renders it moisture sensitive, poor-draining and frost susceptible. The Glacial Till is considered a competent bearing stratum.

A Weathered Ledge or Residual Soil were encountered at many of the test locations. These soils were penetrated with the augers (with difficulty) but met SPT refusal ("N" values greater than 50 blows for less than ≈ 1 -3 inch penetration). The Weathered Ledge was penetrated about ≈ 1 -6 ft at most locations. The depth and thickness (penetration with the augers) of the Weathered Ledge is outlined on the attached Sketch for the respective test bores. Gradation tests indicate a Gravel (≈ 40 -75%), some Sand (≈ 20 -40%), little Silt (≈ 10 -18%). The Weathered Ledge is expected to be rippable with a CAT 200 excavator or equal

Test bore refusal (limited penetration with the augers) was met at all the test locations at depths of ≈ 5 -16 ft. The *USGS Bedrock Geologic Map of Massachusetts* (1983) depicts bedrock in the area to include the Rhode Island Formation. Typical rock types include sedimentary shale, graywacke and sandstone. Such rock is characteristically soft, bedded and platy. The bedrock is expected to include a bedded Dark Grey Shale.

Groundwater was only encountered at B13 about ≈ 14 ft below grade. Most other test holes met refusal less than ≈ 10 ft below grade. The test bores were backfilled upon completion. Observation wells were not installed to allow for stabilized groundwater measurements. It should be noted that fluctuations in the level of the groundwater may occur due to variations in rainfall, temperature, utilities and other factors differing from the time of the measurements. This study was completed at a time of seasonally normal groundwater.

Subgrade Conditions by Others

There is both consistency and inconsistency with the reported subgrade conditions by others. It should be noted that partial reports were provided for our review. Also, these prior explorations were exclusive to the eastern lot.

The *Test Bore Logs* by ESSEX indicate ≈ 15 -20 ft of Ablation Till atop the Bedrock. Again, most of the explorations for this study met Weathered Ledge about ≈ 5 -10 ft below grade with refusal typically less than ≈ 10 -12 ft. Review of the *Test Bore Logs*, however, does indicate some weathered rock, frequent SPT refusals and the need for an air hammer to advance the test bores. The *Test Bore Logs* appear to indicate the difficult drilling to be attributable to tightly nested boulders and cobbles. This would suggest Weathered Ledge or Residual soils at depth consistent with this study.

The *Test Pit Study* shows several test pits (to the east) with refusals about ≈ 5 -8½ ft below grade. It appears subsequent test pits were excavated given the discrepancy between the *Test Bore Logs* (≈ 15 -20 ft refusal) and the *Test Pits* (≈ 5 -8 ft refusal). The subsequent test pits (with an excavator) indicate refusal about ≈ 11 -14 ft below grade. It was noted that the bedrock in the bottom of the pits was fractured into large blocks. These blocks were too large to be dislodged by the excavator. Again, these reports would suggest a Weathered Ledge condition.

Groundwater was reported by ESSEX at depths of ≈ 8 -18 ft (elevation ≈ 204 -213 ft). The shallow groundwater (≈ 8 ft depth) was based on an overnight stabilization. These test bores were completed in November 1999. The later Test Pits (March 2000) typically did not encounter groundwater to the refusal depths of ≈ 11 -14 ft. Where present, groundwater was noted at depths of ≈ 10 -13 ft. Based on the studies, it appears that groundwater is typically greater than ≈ 10 ft below grade.

PRELIMINARY FOUNDATION SUBGRADE RECOMMENDATIONS

The subgrade conditions are favorable for supporting the proposed buildings on a conventional spread footing foundation with a concrete floor slab. The organic laden soils and other questionable materials are not considered suitable for foundation bearing support. These soils shall be stripped from the site. There is expected to be about ≈ 18 -24 inches of site grubbing to strip the organic laden soils. Structural Fill necessary to achieve foundation grade should conform to the *Specifications* (Table 1).

The parent subgrade soils should be exposed in the foundation areas prior to casting the footings or placing structural fill. It is recommended that the parent subgrade soils be proof-rolled with vibratory densification and exhibit stable and compact conditions. The purpose of the proof-rolling is to densify the site soils and identify potential loose or unstable areas which should be removed as necessary. Proof-rolling should involve at least 4-5 passes with a vibratory compactor (minimum 850 pound static weight) operating at peak energy. During the proof rolling process, the subgrade

should be observed by an Engineer to identify areas exhibiting weaving or instability. It will be necessary to remove weakened or unstable soils and replace with a Structural Fill. Proper groundwater control and storm water management are also necessary to maintain site stability.

Bedrock conditions may impact construction depending upon final grading. The bedrock surface should be relatively level with a slope no greater than $\approx 15\%$. It is recommended that a minimum ≈ 12 inch lift of one inch minus crushed stone be placed between the footing and the bedrock surface to provide a more uniform and elastic bearing subgrade. The purpose of the gravel base ("cushion base") is to mitigate differential settlements throughout the foundation. Following a ledge blast within the building footprint, the heaved/disturbed over-blast should be fully removed exposing the underlying intact/competent ledge. This is especially important in the building areas for support of the spread footing foundation. It should be noted that drill holes at least $\approx 6-8$ ft in depth are typically necessary in order to remove ledge with explosive blasting. This may generate additional over-blast that should require engineering review. It may be possible to leave some of the over-blast in-place, however, this will require engineering review (via test pits) during construction. Extensively heaved/disturbed over-blast will not be considered a suitable subgrade as potential subsidence may be experienced when loaded. Our experience with similar projects suggests that the overblast may remain below the foundation limits. This is contingent upon a one foot base of one inch minus crushed stone being placed a minimum one foot below and laterally beyond the footing limits in order to provide a more uniform subgrade. The over-blast to remain will need to be densified and/or compacted prior to the placement of the specified stone base. This may be accomplished with a thin leveling base of one inch minus stone to fill surface irregularities then densification with a minimum one-ton vibratory compactor operating at peak frequency making at least 4-5 passes across the bearing subgrade. The blasting contractor should understand the concerns associated with the over-blast conditions and provide an appropriate drilling/blast pattern. Removal of the bedrock with a hoe ram (if feasible) should mitigate bedrock disturbance. A one inch minus crushed stone may be used to fill in surface irregularities. The Weathered Ledge is expected to be rippable with a CAT 200 excavator or equal. Some of the deeper Ledge may also be dislodged with larger excavator or rippers. The means and methods of ledge removal should be by the Contractor.

The subgrade should ultimately be stable, dewatered, compact and protected from frost throughout construction. Bearing subgrades that become weakened or disturbed due to wet conditions will be rendered unsuitable for structural support. The Contractor shall ultimately be responsible for the means and methods of temporary groundwater control, subgrade protection and site stability during construction. An Engineer from ATC should be scheduled to review the foundation subgrade conditions and preparation during construction.

PRELIMINARY FOUNDATION DESIGN RECOMMENDATIONS

The footings are expected to gain bearing support directly atop the parent soils, weathered ledge and/or compacted structural fill and indirectly atop ledge. Footings may be designed using an allowable bearing capacity of 5 ksf (FS=3). The allowable bearing capacity may be increased $\frac{1}{3}$ when considering transient loads such as seismic or wind. The bearing capacity is contingent upon the perimeter strip footings and isolated column footings being no less than 2 ft and 3 ft in width respectively. For footings less than 3 ft in lateral dimension, the net allowable bearing capacity should be reduced to one-third and multiplied by the least lateral footing dimension in feet. Foundation settlement should be less than $\frac{3}{4}$ inch with differential settlement less than $\frac{1}{2}$ inch. Settlement should be negligible where bedrock is within ≈ 1 -2 ft of the foundation. The settlement should be elastic and occur during construction. Exterior footings shall be provided with at least 4 ft of frost protection.

The subsurface conditions were reviewed with respect to seismic criteria set forth in the *Massachusetts State Building Code (Eighth Edit)*. Based on the relative density of the soils and the depth to groundwater, the site is not susceptible to liquefaction in the event of an earthquake (*Section 1804.6*). Based on interpretation of the *Building Code*, the *Site Classification* (*Section 9.4.1.2.1*) is "C" (Very Dense Soil/Soft Rock).

It is recommended that a minimum 8-inch base of *Clean Granular Fill* (Table 1) be placed below the concrete floor slab for moisture and frost control. The gravel base shall be increased to no less than 12 inches for exterior concrete slabs exposed to frost (minimum 20 inches at entrance ways). A subgrade modulus of 175 pci may be used for design of the floor slab. A vapor retarder should be used below the floor slab dependent upon the floor treatment. A vapor barrier should be specified by others per ACI Standards. A 10-mil polyethylene or StegoWrap™ are often used as a vapor retarder. A vapor retarder would appear necessary given the residential use of the property.

Structural fill necessary within and below the foundation should also conform to the attached *Specifications* (Table 1). The site soils and platy ledge are generally suitable for re-use as Structural Fill or Common Fill provided they are segregated from the organic soils, screened of large stones, conform to the attached Specifications and compacted to specified density.

CONSTRUCTION CONCERNS

The contractor should be required to maintain a stable-dewatered subgrade for the foundations and other concerned areas during construction. Subgrade disturbance may be influenced by excavation methods, moisture, precipitation, groundwater control and construction activities. The Glacial soils are considered potentially vulnerable to disturbance when exposed to wet conditions and construction activities. The presence of wet conditions will further impact the subgrade stability. The contractor should be aware of the moisture concerns and take precautions to reduce subgrade disturbance. Such precautions may include diverting storm run-off away from construction areas,

reducing traffic in sensitive areas, minimizing the extent of exposed subgrade if inclement weather is forecast, backfilling footings as soon as practicable, and maintaining an effective dewatering program. Soils exhibiting weaving or instability should be over-excavated to a competent bearing soil and replaced with a crushed stone or gravel. The moisture concerns are typically more problematic if construction takes place during the winter to spring season or other periods of inclement weather. A protective base of $\frac{3}{4}$ -inch minus crushed stone may be placed ≈ 6 inches below and laterally beyond the footing limits for protection during construction. The stone base is to protect the site soils, facilitate any necessary dewatering and provide a dry/stable base upon which to progress foundation construction. The protective base should be considered elective and dependent upon the site conditions. The stone base should be considered necessary if wet conditions are encountered at footing grade. The protective stone base shall be tamped with a plate compactor and exhibit stable conditions.

Adequate dewatering and storm water management are necessary for maintaining the competency of the site soils. The groundwater table, where encountered, should be continuously maintained at least ≈ 12 inches below construction grade until backfilling is complete. The groundwater or puddled storm water are expected to be controlled with conventional filtered sumps and submersible pumps together with a base of crushed drainage stone. The subgrade should have positive slope towards the temporary sumps. The sumps shall extend at least ≈ 18 inches below construction grade and be protected with filter stone. Soils which become softened and/or disturbed during construction will be rendered unsuitable for structural bearing support.

The subgrade should ultimately be stable, dewatered, compact and protected from frost throughout construction. Bearing subgrades that become weakened or disturbed due to wet conditions will be rendered unsuitable for structural support. The Contractor shall ultimately be responsible for the means and methods of temporary groundwater control, subgrade protection and site stability during construction. An Engineer from ATC should be scheduled to review the foundation subgrade conditions and preparation during construction.

CONSTRUCTION MONITORING

It is recommended that a qualified engineer or representative be retained to review earthwork activities such as the preparation of the foundation bearing subgrade and the placement/compaction of Structural Fill. It is recommended that ATC be retained to provide construction monitoring services. This is to observe compliance with the design concepts presented herein.

We trust the contents of this memorandum report are responsive to your needs at this time. Should you have any questions or require additional assistance, please do not hesitate to contact our office.

LIMITATIONS

Explorations

1. The analyses, recommendations and designs submitted in this report are based in part upon the data obtained from preliminary subsurface explorations. The nature and extent of variations between these explorations may not become evident until construction. If variations then appear evident, it will be necessary to re-evaluate the recommendations of this report.
2. The generalized soil profile described in the text is intended to convey trends in subsurface conditions. The boundaries between strata are approximate and idealized and have been developed by interpretation of widely spaced explorations and samples; actual soil transitions are probably more gradual. For specific information, refer to the individual test pit and/or boring logs.
3. Water level readings have been made in the test pits and/or test borings under conditions stated on the logs. These data have been reviewed and interpretations have been made in the text of this report. However, it must be noted that fluctuations in the level of the groundwater may occur due to variations in rainfall, temperature, and other factors differing from the time the measurements were made.

Review

4. It is recommended that this firm be given the opportunity to review final design drawings and specifications to evaluate the appropriate implementation of the recommendations provided herein.
5. In the event that any changes in the nature, design, or location of the proposed areas are planned, the conclusions and recommendations contained in this report shall not be considered valid unless the changes are reviewed and conclusions of the report modified or verified in writing by ATC Associates, Inc.

Construction

6. It is recommended that this firm be retained to provide geotechnical engineering services during the earthwork phases of the work. This is to observe compliance with the design concepts, specifications, and recommendations and to allow design changes in the event that subsurface conditions differ from those anticipated prior to the start of construction.

Use of Report

7. This report has been prepared for the exclusive use of Hanover R.S. Limited Partnership in accordance with generally accepted soil and foundation engineering practices. No other warranty, expressed or implied, is made.
8. This report has been prepared for this project by ATC Associates, Inc. This report was completed for preliminary design purposes and may be limited in its scope to complete an accurate bid. Contractors wishing a copy of the report may secure it with the understanding that its scope is limited to preliminary geotechnical design considerations.



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Recommended Soil Gradation & Compaction Specifications

TABLE 1

*Hanover
Fisher Street
Foxboro, MA*

Recommended Soil Gradation & Compaction Specifications

Clean Granular Fill (Select Gravel Fill)

SIEVE SIZE	PERCENT PASSING BY WEIGHT
3 inch	100
3/4 inch	60-90
No. 4	20-70
No. 200	2-8

NOTE: For minimum 8-inch base below Concrete Floor Slab-on-Grade
For minimum 12-inch base for exterior concrete slabs exposed to frost
For minimum 20-inch base at entrances, ramps, etc.
Shall have less than 12% fines (No. 200 sieve) based on the Sand fraction
Compact to 95% relative compaction per ASTM D1557

Structural Fill (Gravelly SAND, little Silt)

SIEVE SIZE	PERCENT PASSING BY WEIGHT
5 inch	100
3/4 inch	60-100
No. 4	20-80
No. 200	0-12

NOTE: For use as structural load support below the foundations
For use as backfill behind unbalanced foundation/retaining walls
A ¾-inch crushed stone may be used in wet conditions
Shall have less than 20% fines (No. 200 sieve) based on the Sand fraction
Compact to 95% relative compaction per ASTM D1557

TABLE 1

*Hanover
Fisher Street
Foxboro, MA*

Recommended Soil Gradation & Compaction Specifications

*Common Fill
(Silty SAND, little Gravel)*

SIEVE SIZE	PERCENT PASSING BY WEIGHT
6 inch	100
3/4 inch	60-100
No. 4	20-85
No. 200	0-25

NOTE: For use as roadway embankment fill in pavement areas.
Maximum stone size should be $\frac{2}{3}$ the maximum lift thickness
Compact to at least 93% relative compaction per ASTM D1557

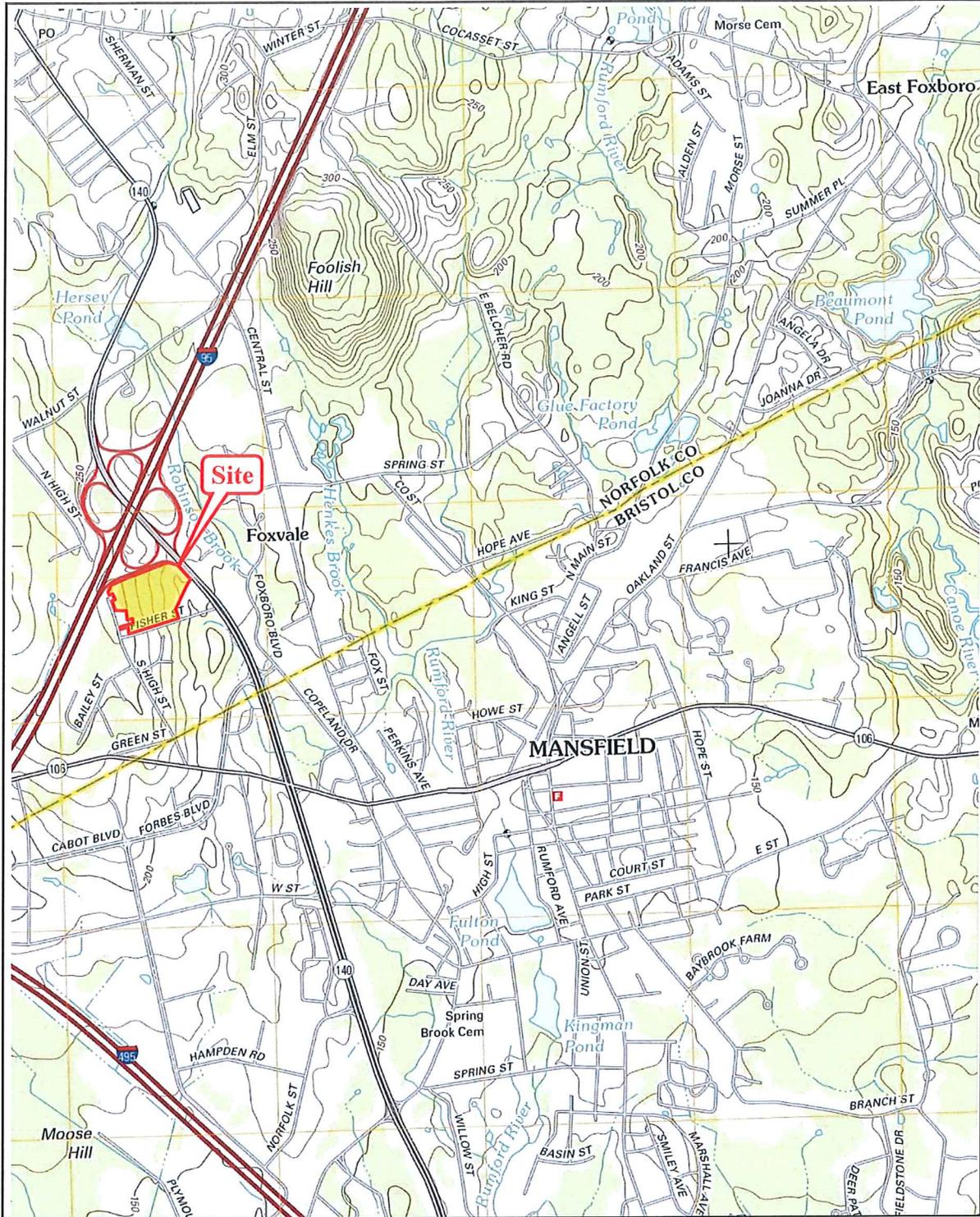
Structural Fill placed beneath the foundation should include the *Footing Zone of Influence* which is defined as that area extending laterally one foot from the edge of the footing then outward and downward at a 1H:1V splay. Structural Fill should be placed in loose lifts not exceeding 12 inches for heavy vibratory rollers and 8 inches for vibratory plate compactors. Structural Fill should be compacted to at least 95 percent of maximum dry density as determined by the Modified Proctor Test (ASTM-D1557). Compacted Fill should be densified within $\pm 3\%$ of optimum moisture content. The adequacy of the compaction efforts should be verified by field density testing which is also a requirement of the *Massachusetts State Building Code*.



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Site Vicinity Map



Site Vicinity Map

Source:
 United States Geological Survey
 Mansfield, MA Quadrangle
 7.5 Minute Series
 Scale: 1:24,000
 (2012)



Phase I Environmental Site Assessment
 Lot 114
 Fisher Street
 Foxborough, Massachusetts 02035



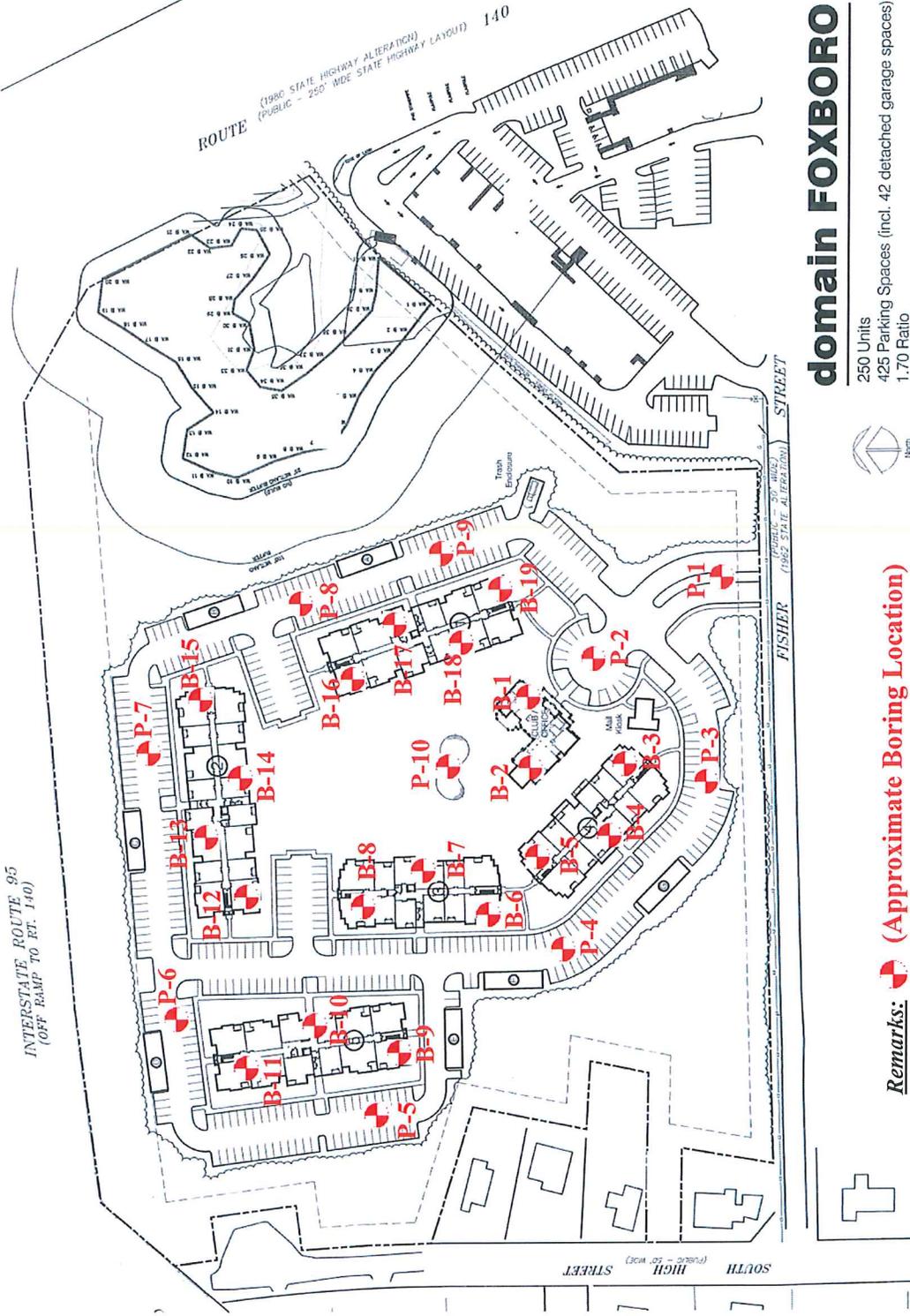
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Boring Location Plans

BORING LOCATION PLAN

INTERSTATE ROUTE 95
(OFF RAMP TO RT. 140)



domain FOXBORO

250 Units
425 Parking Spaces (incl. 42 detached garage spaces)
1.70 Ratio



Remarks: (Approximate Boring Location)

Preliminary Geotechnical Study
Proposed Residential Apartments
Lot 114 Fisher St.
Foxboro, MA



Project No. 025.19006.0018	Date January 12, 2014
Scale No Scale	Drawing Figure 1



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Boring Logs

TEST BORING LOG

SHEET 1

Soil Exploration Corp.
 Geotechnical Drilling
 Groundwater Monitor Well
 148 Pioneer Drive
 Leominster, MA 01453
 978 840-0391

Cardno ATC
 Site: **Proposed Condo Site**
Fisher Sreet
Foxboro, MA

BORING B-1

PROJECT NO. 14-1123

DATE: November 24, 2014

Ground Elevation:

Date Started: November 21, 2014

Date Finished: November 21, 2014

Driller: GG

Soil Engineer/Geologist: Antonio Rodrigues

GROUNDWATER OBSERVATIONS

DATE	DEPTH	CASING	STABILIZATION

Depth Ft.	Casing bl/ft	Sample				Strata	Visual Identification of Soil and / or Rock Sample
		No.	Pen/Rec	Depth	Blows/6"		
1		1	8"	0-2'0"	2-3-2-2	2'0"	Loose, dry fine to coarse Sand, some silt, some medium to fine gravel. (Topsoil & Subsoil)
5		2	7"	5'0"-6'1"	21-23-50/1"	5'0"	Medium dense, dry, tan, fine to medium Gravel, and fine to coarse Sand, little silt, trace cobble.
10		3	0"	10'0"-10'1"	75/1"	10'1"	Very dense, dry weathered rock.
15							End of boring at 10'1". Refusal with augers and spoon. No water encountered.
20							
25							
30							
35							
39							

Notes: Hollow Stem Auger Size - 4 1/4"

Cohesionless: 0 - 4 V. Loose, 4 - 10 Loose, 10 -30 M Dense, 30 -50 Dense, 50+ V Dense.	Trace 0 to 10% Little 10 to 20%	ID SIZE (IN)	CASING	SAMPLE	CORE TYPE
Cohesive: 0 -2 V Soft, 2 -4 Soft, 4 -8 M Stiff 8 -15 Stiff, 15 -30 V. Stiff, 30 + Hard.	Some 20 to 35% And 35% to 50%	HAMMER WGT (LB) HAMMER FALL (IN)		140 lb. 30"	

TEST BORING LOG

SHEET 2

Soil Exploration Corp.
 Geotechnical Drilling
 Groundwater Monitor Well
 148 Pioneer Drive
 Leominster, MA 01453
 978 840-0391

Cardno ATC
 Site: **Proposed Condo Site**
Fisher Sreet
Foxboro, MA

BORING B-2

PROJECT NO. 14-1123

DATE: November 24, 2014

Ground Elevation:

Date Started: November 20, 2014

Date Finished: November 20, 2014

Driller: GG

Soil Engineer/Geologist: Antonio Rodrigues

GROUNDWATER OBSERVATIONS

DATE	DEPTH	CASING	STABILIZATION

Depth Ft.	Casing bl/ft	Sample		Blows/6'	Strata	Visual Identification of Soil and / or Rock Sample
		No.	Pen/Rec			
1		1		0-2'0"	1-2-1-3	2'0" Loose, dry fine to coarse Sand, some silt, some medium to fine gravel. (Topsoil & Subsoil)
		2	14"	2'0"-4'0"	5-8-13-31	
5						5'0" Dense, dry, grey, fine to coarse Gravel, and fine to coarse Sand, little silt to Weathered rock.
10						End of boring at 5'0". Refusal with augers.
15						
20						
25						
30						
35						
39						

Notes: Hollow Stem Auger Size - 4 1/4"

Cohesionless: 0 - 4 V. Loose, 4 - 10 Loose, 10 -30 M Dense, 30 -50 Dense, 50+ V Dense.	Trace 0 to 10%	CASING	SAMPLE	CORE TYPE
Cohesive: 0 -2 V Soft, 2 -4 Soft, 4 -8 M Stiff	Little 10 to 20%	ID SIZE (IN)	SS	
8 -15 Stiff, 15 -30 V. Stiff, 30 + Hard.	Some 20 to 35%	HAMMER WGT (LB)	140 lb.	
	And 35% to 50%	HAMMER FALL (IN)	30"	

TEST BORING LOG

SHEET 3

Soil Exploration Corp.
 Geotechnical Drilling
 Groundwater Monitor Well
 148 Pioneer Drive
 Leominster, MA 01453
 978 840-0391

Cardno ATC
 Site: **Proposed Condo Site**
Fisher Sreet
Foxboro, MA

BORING B-3

PROJECT NO. 14-1123

DATE: November 24, 2014

Ground Elevation:

Date Started: November 20, 2014

Date Finished: November 20, 2014

Driller: GG

Soil Engineer/Geologist: Antonio Rodrigues

GROUNDWATER OBSERVATIONS

DATE	DEPTH	CASING	STABILIZATION

Depth Ft.	Casing bl/ft	Sample		Blows/6"	Strata	Visual Identification of Soil and / or Rock Sample
		No.	Pen/Rec			
1		1	8"	0-2'0"	5-4-5-5	Topsoil <hr/> Loose to medium dense, grey, fine to coarse Sand, and Silt, and fine to medium gravel, trace cobbles.
		2	17"	2'0"-4'0"	4-5-12-18	
5		3		5'0"-5'0"	5'0"	Very dense, dry weathered rock.
10		4		9'0"-9'2"	9'2"	End of boring at 9'2". Refusal with augers and spoon. No water encountered.
15						
20						
25						
30						
35						
39						

Notes: Hollow Stem Auger Size - 4 1/4"

Cohesionless: 0 - 4 V. Loose, 4 - 10 Loose, 10 -30 M Dense, 30 -50 Dense, 50+ V Dense. Cohesive: 0 -2 V Soft, 2 -4 Soft, 4 -8 M Stiff 8 -15 Stiff, 15 -30 V. Stiff, 30 + Hard.	Trace 0 to 10% Little 10 to 20% Some 20 to 35% And 35% to 50%	CASING ID SIZE (IN) HAMMER WGT (LB) HAMMER FALL (IN)	SAMPLE SS 140 lb. 30"	CORE TYPE
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TEST BORING LOG

SHEET 4

Soil Exploration Corp.
 Geotechnical Drilling
 Groundwater Monitor Well
 148 Pioneer Drive
 Leominster, MA 01453
 978 840-0391

Cardno ATC
 Site: **Proposed Condo Site**
Fisher Sreet
Foxboro, MA

BORING B-4

PROJECT NO. 14-1123

DATE: November 24, 2014

Ground Elevation:
 Date Started: November 20, 2014
 Date Finished: November 20, 2014
 Driller: GG
 Soil Engineer/Geologist:

GROUNDWATER OBSERVATIONS			
DATE	DEPTH	CASING	STABILIZATION

Depth Ft.	Casing bl/ft	Sample				Strata	Visual Identification of Soil and / or Rock Sample
		No.	Pen/Rec	Depth	Blows/6"		
1		1	10"	0-2'0"	1-2-4-6	3"	Topsoil <hr/> Loose, grey, fine to coarse Sand, and fine to medium gravel, little Silt, trace cobbles.
5		2		5'0"-5'5"	60/5"	5'0"	<hr/> Very dense, dry weathered rock.
10		3		10'0"-10'5"	60/5"	10'5"	<hr/> End of boring at 10'5". Refusal with augers and spoon. No water encountered.
15							
20							
25							
30							
35							
39							

Notes: Hollow Stem Auger Size - 4 1/4"

Cohesionless: 0 - 4 V. Loose, 4 - 10 Loose, 10 -30 M Dense, 30 -50 Dense, 50+ V Dense.	Trace 0 to 10% Little 10 to 20%	ID SIZE (IN)	CASING	SAMPLE	CORE TYPE
Cohesive: 0 -2 V Soft, 2 -4 Soft, 4 -8 M Stiff 8 -15 Stiff, 15 -30 V. Stiff, 30 + Hard.	Some 20 to 35% And 35% to 50%	HAMMER WGT (LB) HAMMER FALL (IN)		140 lb. 30"	

TEST BORING LOG

SHEET 5

Soil Exploration Corp.
 Geotechnical Drilling
 Groundwater Monitor Well
 148 Pioneer Drive
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 978 840-0391

Cardno ATC
 Site: **Proposed Condo Site**
Fisher Sreet
Foxboro, MA

BORING B-5

PROJECT NO. 14-1123

DATE: November 24, 2014

Ground Elevation:
 Date Started: November 20, 2014
 Date Finished: November 20, 2014
 Driller: GG
 Soil Engineer/Geologist: Antonio Rodrigues

GROUNDWATER OBSERVATIONS			
DATE	DEPTH	CASING	STABILIZATION

Depth Ft.	Casing bl/ft	Sample		Blows/6"	Strata	Visual Identification of Soil and / or Rock Sample
		No.	Pen/Rec			
1		1	7"	0-2'0"	2-4-6-18	6" Loose to Medium dense, dry, brown, fine to coarse Sand, some medium to fine gravel, little silt, trace cobbles. (Subsoil)
5		2	5"	5'0"-5'11"	50-50/5"	5'0" Very dense, dry, weathered rock.
10		3	0"	10'0"-10'1"	50/1"	10'1" End of boring at 10'1". Refusal with augers and spoon. No water encountered.
15						
20						
25						
30						
35						
39						

Notes: Hollow Stem Auger Size - 4 1/4"

Cohesionless: 0 - 4 V. Loose, 4 - 10 Loose, 10 -30 M Dense, 30 -50 Dense, 50+ V Dense. Cohesive: 0 -2 V Soft, 2 -4 Soft, 4 -8 M Stiff 8 -15 Stiff, 15 -30 V. Stiff, 30 + Hard.	Trace 0 to 10% Little 10 to 20% Some 20 to 35% And 35% to 50%	CASING ID SIZE (IN) HAMMER WGT (LB) HAMMER FALL (IN)	SAMPLE SS 140 lb. 30"	CORE TYPE
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TEST BORING LOG

SHEET 6

Soil Exploration Corp.
 Geotechnical Drilling
 Groundwater Monitor Well
 148 Pioneer Drive
 Leominster, MA 01453
 978 840-0391

Cardno ATC
Site: Proposed Condo Site
Fisher Sreet
Foxboro, MA

BORING B-6

PROJECT NO. 14-1123

DATE: November 24, 2014

Ground Elevation:
 Date Started: November 21, 2014
 Date Finished: November 21, 2014
 Driller: GG
 Soil Engineer/Geologist: Antonio Rodrigues

GROUNDWATER OBSERVATIONS

DATE	DEPTH	CASING	STABILIZATION

Depth Ft.	Casing bl/ft	Sample		Blows/6"	Strata	Visual Identification of Soil and / or Rock Sample
		No.	Pen/Rec			
1		1	2"	0-2'0"	2-2-2-4	2'0" Loose, dry fine to coarse Sand, some silt, some medium to fine gravel. (Topsoil & Subsoil)
5		2	4"	5'0"-5'9"	31-50/3"	5'0" Dry, grey, fine to coarse Gravel, some fine to coarse sand, little silt, trace cobbles.
10						9'0" Very dense, dry, weathered rock.
15						End of boring at 9'0". Refusal with augers. No water encountered.
20						
25						
30						
35						
39						

Notes: Hollow Stem Auger Size - 4 1/4"

Cohesionless: 0 - 4 V. Loose, 4 - 10 Loose, 10 - 30 M Dense, 30 - 50 Dense, 50+ V Dense.	Trace 0 to 10% Little 10 to 20%	CASING	SAMPLE	CORE TYPE
Cohesive: 0 - 2 V Soft, 2 - 4 Soft, 4 - 8 M Stiff 8 - 15 Stiff, 15 - 30 V. Stiff, 30 + Hard.	Some 20 to 35% And 35% to 50%	ID SIZE (IN) HAMMER WGT (LB) HAMMER FALL (IN)	SS 140 lb. 30"	

TEST BORING LOG

SHEET 7

Soil Exploration Corp.
 Geotechnical Drilling
 Groundwater Monitor Well
 148 Pioneer Drive
 Leominster, MA 01453
 978 840-0391

Cardno ATC
 Site: **Proposed Condo Site**
Fisher Sreet
Foxboro, MA

BORING B-7

PROJECT NO. 14-1123

DATE: November 24, 2014

Ground Elevation:
 Date Started: November 21, 2014
 Date Finished: November 21, 2014
 Driller: GG
 Soil Engineer/Geologist: Antonio Rodrigues

GROUNDWATER OBSERVATIONS

DATE	DEPTH	CASING	STABILIZATION

Depth Ft.	Casing bl/ft	Sample		Blows/6"	Strata	Visual Identification of Soil and / or Rock Sample
		No.	Pen/Rec			
1		1	6"	0-2'0"	2-3-2-3	2'0"
		2	8"	2'0"-4'0"	7-9-16-25	
5		3	10"	5'0"-6'0"	37-83	4'0" 5'0"
10		4	8"	10'0"-11'2"	28-66-50/2"	11'2"
15						
20						
25						
30						
35						
39						

Notes: Hollow Stem Auger Size - 4 1/4"

Cohesionless: 0 - 4 V. Loose, 4 - 10 Loose, 10 -30 M Dense, 30 -50 Dense, 50+ V Dense. Cohesive: 0 -2 V Soft, 2 -4 Soft, 4 -8 M Stiff 8 -15 Stiff, 15 -30 V. Stiff, 30 + Hard.	Trace 0 to 10% Little 10 to 20% Some 20 to 35% And 35% to 50%	CASING ID SIZE (IN) HAMMER WGT (LB) HAMMER FALL (IN)	SAMPLE SS 140 lb. 30"	CORE TYPE
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TEST BORING LOG

SHEET 8

Soil Exploration Corp.
 Geotechnical Drilling
 Groundwater Monitor Well
 148 Pioneer Drive
 Leominster, MA 01453
 978 840-0391

Cardno ATC
 Site: **Proposed Condo Site**
Fisher Sreet
Foxboro, MA

BORING B-8

PROJECT NO. 14-1123

DATE: November 24, 2014

Ground Elevation:
 Date Started: November 21, 2014
 Date Finished: November 21, 2014
 Driller: GG
 Soil Engineer/Geologist: Antonio Rodrigues

GROUNDWATER OBSERVATIONS

DATE	DEPTH	CASING	STABILIZATION

Depth Ft.	Casing bl/ft	Sample		Blows/6"	Strata	Visual Identification of Soil and / or Rock Sample
		No.	Pen/Rec			
1		1	4"	0-2'0"	1-3-3-4	Loose, dry fine to coarse Sand, some silt, some medium to fine gravel. (Topsoil & Subsoil)
5		2	8"	5'0"-5'10"	33-75/4"	Loose, grey, dry, fine to medium Gravel, and fine to coarse sand, little silt, trace cobbles.
10					9'0"	Very dense, dry weathered rock.
15						End of boring at 9'0". Refusal with augers.
20						
25						
30						
35						
39						

Notes: Hollow Stem Auger Size - 4 1/4"

Cohesionless: 0 - 4 V. Loose, 4 - 10 Loose, 10 -30 M Dense, 30 -50 Dense, 50+ V Dense. Cohesive: 0 -2 V Soft, 2 -4 Soft, 4 -8 M Stiff 8 -15 Stiff, 15 -30 V. Stiff, 30 + Hard.	Trace 0 to 10% Little 10 to 20% Some 20 to 35% And 35% to 50%	CASING ID SIZE (IN) HAMMER WGT (LB) HAMMER FALL (IN)	SAMPLE SS 140 lb. 30"	CORE TYPE
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TEST BORING LOG

SHEET 9

Soil Exploration Corp.
 Geotechnical Drilling
 Groundwater Monitor Well
 148 Pioneer Drive
 Leominster, MA 01453
 978 840-0391

Cardno ATC
 Site: **Proposed Condo Site**
 Fisher Sreet
 Foxboro, MA

BORING B-9

PROJECT NO. 14-1123

DATE: December 1, 2014

Ground Elevation:
 Date Started: November 26, 2014
 Date Finished: November 26, 2014
 Driller: PG

Soil Engineer/Geologist:

GROUNDWATER OBSERVATIONS

DATE	DEPTH	CASING	STABILIZATION

Depth Ft.	Casing bl/ft	Sample				Strata	Visual Identification of Soil and / or Rock Sample
		No.	Pen/Rec	Depth	Blows/6"		
1		1	NR	0-2'0"	4-3-1-5	3"	Topsoil
5		2	18"	5'0"-7'0"	22-41-37-31	8'0"	Dry, grey, fine to medium Gravel, and fine to coarse sand, little silt (Weathered Rock)
10							End of boring at 8'0". Auger refusal.
15							
20							
25							
30							
35							
39							

Notes: Hollow Stem Auger Size - 4 1/4"

Cohesionless: 0 - 4 V. Loose, 4 - 10 Loose, 10 -30 M Dense, 30 -50 Dense, 50+ V Dense. Cohesive: 0 -2 V Soft, 2 -4 Soft, 4 -8 M Stiff 8 -15 Stiff, 15 -30 V. Stiff, 30 + Hard.	Trace 0 to 10% Little 10 to 20% Some 20 to 35% And 35% to 50%	CASING ID SIZE (IN) HAMMER WGT (LB) HAMMER FALL (IN)	SAMPLE SS 140 lb. 30"	CORE TYPE
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TEST BORING LOG

SHEET 10

Soil Exploration Corp.
 Geotechnical Drilling
 Groundwater Monitor Well
 148 Pioneer Drive
 Leominster, MA 01453
 978 840-0391

Cardno ATC
 Site: **Proposed Condo Site**
Fisher Sreet
Foxboro, MA

BORING B-10

PROJECT NO. 14-1123

DATE: December 1, 2014

Ground Elevation:

Date Started: November 26, 2014

Date Finished: November 26, 2014

Driller: PG

Soil Engineer/Geologist: Antonio Rodrigues

GROUNDWATER OBSERVATIONS

DATE	DEPTH	CASING	STABILIZATION

Depth Ft.	Casing bl/ft	Sample				Strata	Visual Identification of Soil and / or Rock Sample
		No.	Pen/Rec	Depth	Blows/6"		
1		1	3"	0-2'0"	1-1-1-2	4" Dry, brown, very loose fine to medium sand and silt, little fine to medium gravel, little organics. Dry, brown, very dense, fine to course sand, and silt, some fine to medium gravel, to weathered rock. Weather rock.	
		2	12"	2'0"-4'0"	4-12-41-65		
5		3	NR	5'0"-5'2"	100/2"		
10						6'0" End of boring at 6'0". Auger refusal.	
15							
20							
25							
30							
35							
39							

Notes: Hollow Stem Auger Size - 4 1/4"

Cohesionless: 0 - 4 V. Loose, 4 - 10 Loose, 10 -30 M Dense, 30 -50 Dense, 50+ V Dense. Cohesive: 0 -2 V Soft, 2 -4 Soft, 4 -8 M Stiff 8 -15 Stiff, 15 -30 V. Stiff, 30 + Hard.	Trace 0 to 10% Little 10 to 20% Some 20 to 35% And 35% to 50%	CASING ID SIZE (IN) HAMMER WGT (LB) HAMMER FALL (IN)	SAMPLE SS 140 lb. 30"	CORE TYPE
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TEST BORING LOG

SHEET 11

Soil Exploration Corp.
 Geotechnical Drilling
 Groundwater Monitor Well
 148 Pioneer Drive
 Leominster, MA 01453
 978 840-0391

Cardno ATC
 Site: **Proposed Condo Site**
Fisher Sreet
Foxboro, MA

BORING B-11

PROJECT NO. 14-1123

DATE: December 1, 2014

Ground Elevation:
 Date Started: November 26, 2014
 Date Finished: November 26, 2014
 Driller: PG
 Soil Engineer/Geologist:

GROUNDWATER OBSERVATIONS

DATE	DEPTH	CASING	STABILIZATION

Depth Ft.	Casing bl/ft	Sample				Strata	Visual Identification of Soil and / or Rock Sample
		No.	Pen/Rec	Depth	Blows/6"		
1		1	12"	0-2'0"	4-4-6-4	2"	Topsoil Dry, brown, loose fine and coarse Sand, some silt, some fine to medium gravel, little organics.
5		2	6"	5'0"-5'9"	36-100/3"	5'0"	Dry, grey, very dense, fine to coarse Sand, and fine to medium gravel. little silt.
10		3	21"	10'0"-12'0"	20-20-13-15		Dry, grey, dense fine to coarse Sand, some silt, some fine to medium gravel.
15						13'0"	End of boring at 13'0". Auger refusal.
20							
25							
30							
35							
39							

Notes: Hollow Stem Auger Size - 4 1/4"

Cohesionless: 0 - 4 V. Loose, 4 - 10 Loose, 10 -30 M Dense, 30 -50 Dense, 50+ V Dense. Cohesive: 0 -2 V Soft, 2 -4 Soft, 4 -8 M Stiff 8 -15 Stiff, 15 -30 V. Stiff, 30 + Hard.	Trace 0 to 10% Little 10 to 20% Some 20 to 35% And 35% to 50%	CASING ID SIZE (IN) HAMMER WGT (LB) HAMMER FALL (IN)	SAMPLE SS 140 lb. 30"	CORE TYPE
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TEST BORING LOG

SHEET 12

Soil Exploration Corp.
 Geotechnical Drilling
 Groundwater Monitor Well
 148 Pioneer Drive
 Leominster, MA 01453
 978 840-0391

Cardno ATC
 Site: **Proposed Condo Site**
Fisher Sreet
Foxboro, MA

BORING B-12

PROJECT NO. 14-1123

DATE: December 1, 2014

Ground Elevation:

Date Started: November 25, 2014

Date Finished: November 25, 2014

Driller: PG

Soil Engineer/Geologist: Antonio Rodrigues

GROUNDWATER OBSERVATIONS

DATE	DEPTH	CASING	STABILIZATION

Depth Ft.	Casing bl/ft	Sample				Strata	Visual Identification of Soil and / or Rock Sample
		No.	Pen/Rec	Depth	Blows/6"		
1		1	9"	0-2'0"	2-3-4-3	6"	Topsoil
		2	15"	2'0"-4'0"	10-31-37-41	2'0"	Dry, brown, loose fine to coarse Sand, some silt, some fine to medium gravel, trace organics. (Subsoil) Dry, tan, very dense, fine to coarse Sand, little silt, little fine gravel.
5		3	15"	5'0"-7'0"	46-48-58-61		Dry, grey, very dense, fine to coarse Gravel, some coarse sand, little silt to Weathered Rock. Weathered Rock
		4	9"	7'0"-7'10"	53-100/4"		
10						8'0"	End of boring at 8'0". Auger refusal.
15							
20							
25							
30							
35							
39							

Notes: Hollow Stem Auger Size - 4 1/4"

Cohesionless: 0 - 4 V. Loose, 4 - 10 Loose, 10 -30 M Dense, 30 -50 Dense, 50+ V Dense. Cohesive: 0 -2 V Soft, 2 -4 Soft, 4 -8 M Stiff 8 -15 Stiff, 15 -30 V. Stiff, 30 + Hard.	Trace 0 to 10% Little 10 to 20% Some 20 to 35% And 35% to 50%	CASING ID SIZE (IN) HAMMER WGT (LB) HAMMER FALL (IN)	SAMPLE SS 140 lb. 30"	CORE TYPE
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TEST BORING LOG

SHEET 13

Soil Exploration Corp.
 Geotechnical Drilling
 Groundwater Monitor Well
 148 Pioneer Drive
 Leominster, MA 01453
 978 840-0391

Cardno ATC
 Site: **Proposed Condo Site**
Fisher Sreet
Foxboro, MA

BORING B-13

PROJECT NO. 14-1123

DATE: December 1, 2014

Ground Elevation:

Date Started: November 25, 2014

Date Finished: November 25, 2014

Driller: PG

Soil Engineer/Geologist:

GROUNDWATER OBSERVATIONS

DATE	DEPTH	CASING	STABILIZATION
12/1/14	14'6"	N/A	Upon Completion

Depth Ft.	Casing bl/ft	Sample				Strata	Visual Identification of Soil and / or Rock Sample
		No.	Pen/Rec	Depth	Blows/6"		
1		1	6"	0-2'0"	3-4-4-5	3"	Topsoil Dry, brown, loose fine to coarse sand, some silt, some fine to medium gravel, little organics. (Subsoil)
5		2	21"	5'0"-7'0"	13-53-37-25		Dry, grey/brown, very dense, fine to coarse Sand, and silt some fine to coarse gravel.
10		3		10'0"-12'0"	10-29-34-21		Dry, grey, dense, fine to coarse Gravel and fine to coarse sand, little silt.
15		4	3"	15'0"-15'5"	100/5"	16'0"	Wet, grey, very dense weathered bedrock.
20							End of boring at 16'0". Auger refusal. Groundwater table at 14'6".
25							
30							
35							
39							

Notes: Hollow Stem Auger Size - 4 1/4"

Cohesionless: 0 - 4 V. Loose, 4 - 10 Loose, 10 -30 M Dense, 30 -50 Dense, 50+ V Dense.	Trace	0 to 10%	CASING	SAMPLE	CORE TYPE
Cohesive: 0 -2 V Soft, 2 -4 Soft, 4 -8 M Stiff	Little	10 to 20%	ID SIZE (IN)	SS	
8 -15 Stiff, 15 -30 V. Stiff, 30 + Hard.	Some	20 to 35%	HAMMER WGT (LB)	140 lb.	
	And	35% to 50%	HAMMER FALL (IN)	30"	

TEST BORING LOG

SHEET 14

Soil Exploration Corp.
 Geotechnical Drilling
 Groundwater Monitor Well
 148 Pioneer Drive
 Leominster, MA 01453
 978 840-0391

Cardno ATC
 Site: **Proposed Condo Site**
Fisher Sreet
Foxboro, MA

BORING B-14

PROJECT NO. 14-1123

DATE: December 1, 2014

Ground Elevation:

Date Started: November 25, 2014

Date Finished: November 25, 2014

Driller: PG

Soil Engineer/Geologist:

GROUNDWATER OBSERVATIONS

DATE	DEPTH	CASING	STABILIZATION

Depth Ft.	Casing bl/ft	Sample				Strata	Visual Identification of Soil and / or Rock Sample
		No.	Pen/Rec	Depth	Blows/6"		
1		1	15"	0-2'0"	1-2-5-8	2"	Topsoil
		2	3"	2'0"-4'0"	8-8-9-9		Dry, brown, loose to medium dense, fine to coarse Sand, some silt, some fine to medium gravel, little to trace organics. (Subsoil)
5		3	18"	5'0"-7'0"	21-35-46-39	4'0"	Dry, grey, very dense, fine to coarse Gravel, some fine to coarse sand, little silt.
		4	21"	7'0"-9'0"	53-81-66-57		Dry, grey, very dense, fine to coarse Sand, some silt, some fine to medium gravel.
10		5		10'0"-12'0"	27-33-31-35	15'0"	Dry, grey, very dense, Fine to coarse Sand, and silt, some fine to medium gravel.
		6	21"	12'0"-14'0"	39-44-79-77		Dry, grey, very dense, Fine to coarse Gravel, and fine to coarse sand, little silt.
15							End of boring at 15'0". Auger refusal.
20							
25							
30							
35							
39							

Notes: Hollow Stem Auger Size - 4 1/4"

Cohesionless: 0 - 4 V. Loose, 4 - 10 Loose, 10 -30 M Dense, 30 -50 Dense, 50+ V Dense.	Trace 0 to 10%	CASING	SAMPLE	CORE TYPE
Cohesive: 0 -2 V Soft, 2 -4 Soft, 4 -8 M Stiff	Little 10 to 20%	ID SIZE (IN)	SS	
8 -15 Stiff, 15 -30 V. Stiff, 30 + Hard.	Some 20 to 35%	HAMMER WGT (LB)	140 lb.	
	And 35% to 50%	HAMMER FALL (IN)	30"	

TEST BORING LOG

SHEET 15

Soil Exploration Corp.
 Geotechnical Drilling
 Groundwater Monitor Well
 148 Pioneer Drive
 Leominster, MA 01453
 978 840-0391

Cardno ATC
 Site: **Proposed Condo Site**
Fisher Sreet
Foxboro, MA

BORING B-15

PROJECT NO. 14-1123

DATE: December 1, 2014

Ground Elevation:

Date Started: November 25, 2014

Date Finished: November 25, 2014

Driller: PG

Soil Engineer/Geologist:

GROUNDWATER OBSERVATIONS

DATE	DEPTH	CASING	STABILIZATION

Depth Ft.	Casing bl/ft	Sample				Strata	Visual Identification of Soil and / or Rock Sample
		No.	Pen/Rec	Depth	Blows/6"		
1		1	3"	0-2'0"	1-1-1-2	5"	Topsoil. <hr/> Dry, brown, very loose fine to coarse Sand, some silt, some fine to medium gravel, little organics. (Subsoil)
5		2	12"	5'0"-6'4"	22-53-100/4"	2'0"	<hr/> Dry, grey, very dense, fine to coarse Sand, and silt, and fine to medium gravel, to Weathered Rock
10						9'6"	<hr/> End of boring at 9'6". Auger refusal.
15							
20							
25							
30							
35							
39							

Notes: Hollow Stem Auger Size - 4 1/4"

Cohesionless: 0 - 4 V. Loose, 4 - 10 Loose, 10 -30 M Dense, 30 -50 Dense, 50+ V Dense.	Trace 0 to 10%	CASING	SAMPLE	CORE TYPE
Cohesive: 0 -2 V Soft, 2 -4 Soft, 4 -8 M Stiff	Little 10 to 20%	ID SIZE (IN)	SS	
8 -15 Stiff, 15 -30 V. Stiff, 30 + Hard.	Some 20 to 35%	HAMMER WGT (LB)	140 lb.	
	And 35% to 50%	HAMMER FALL (IN)	30"	

TEST BORING LOG

SHEET 16

Soil Exploration Corp.
 Geotechnical Drilling
 Groundwater Monitor Well
 148 Pioneer Drive
 Leominster, MA 01453
 978 840-0391

Cardno ATC
 Site: **Proposed Condo Site**
Fisher Sreet
Foxboro, MA

BORING B-16

PROJECT NO. 14-1123

DATE: November 25, 2014

Ground Elevation:

Date Started: November 24, 2014

Date Finished: November 24, 2014

Driller: PG

Soil Engineer/Geologist: Antonio Rodrigues

GROUNDWATER OBSERVATIONS

DATE	DEPTH	CASING	STABILIZATION

Depth Ft.	Casing bl/ft	Sample				Strata	Visual Identification of Soil and / or Rock Sample
		No.	Pen/Rec	Depth	Blows/6"		
						3"	Topsoil
1		1	9"	0-2'0"	1-2-3-5	9'0"	Dry, brown, loose, fine to coarse Sand, some silt, trace fine to medium gravel. (Subsoil)
		2	12"	2'0"-4'0"	11-23-35-44		Dry, grey, very dense, fine to coarse Gravel, some fine to coarse sand, little silt.
5		3	18"	5'0"-7'0"	27-35-55-53		Dry, grey, very dense, fine to coarse Gravel, some fine to coarse sand, little silt.
		4	15"	7'0"-8'9"	43-53-71-100/1"		Dry, grey, very dense, fine to coarse Gravel, and fine to coarse sand, little silt, to Weathered Rock
10							End of boring at 9'0". Auger refusal.
15							
20							
25							
30							
35							
39							

Notes: Hollow Stem Auger Size - 4 1/4"

Cohesionless: 0 - 4 V. Loose, 4 - 10 Loose, 10 -30 M Dense, 30 -50 Dense, 50+ V Dense.	Trace	0 to 10%	CASING	SAMPLE	CORE TYPE
Cohesive: 0 -2 V Soft, 2 -4 Soft, 4 -8 M Stiff	Little	10 to 20%	ID SIZE (IN)	SS	
8 -15 Stiff, 15 -30 V. Stiff, 30 + Hard.	Some	20 to 35%	HAMMER WGT (LB)	140 lb.	
	And	35% to 50%	HAMMER FALL (IN)	30"	

TEST BORING LOG

SHEET 17

Soil Exploration Corp.
 Geotechnical Drilling
 Groundwater Monitor Well
 148 Pioneer Drive
 Leominster, MA 01453
 978 840-0391

Cardno ATC
 Site: **Proposed Condo Site**
Fisher Sreet
Foxboro, MA

BORING B-17

PROJECT NO. 14-1123

DATE: November 25, 2014

Ground Elevation:
 Date Started: November 24, 2014
 Date Finished: November 24, 2014
 Driller: PG
 Soil Engineer/Geologist: Antonio Rodrigues

GROUNDWATER OBSERVATIONS

DATE	DEPTH	CASING	STABILIZATION

Depth Ft.	Casing bl/ft	Sample				Strata	Visual Identification of Soil and / or Rock Sample
		No.	Pen/Rec	Depth	Blows/6"		
1		1	9"	0-2'0"	1-1-2-2	3"	Topsoil Dry, brown, very loose fine to coarse Sand, some silt, some fine to medium gravel, little organics. (Subsoil)
5		2	15"	5'0"-7'0"	15-28-35-43	2'0"	 Dry, grey, very dense, fine to medium Gravel, some fine to coarse sand, trace silt
10						9'6"	 End of boring at 9'6". Auger refusal.
15							
20							
25							
30							
35							
39							

Notes: Hollow Stem Auger Size - 4 1/4"

Cohesionless: 0 - 4 V. Loose, 4 - 10 Loose, 10 -30 M Dense, 30 -50 Dense, 50+ V Dense.	Trace 0 to 10%	CASING	SAMPLE	CORE TYPE
Cohesive: 0 -2 V Soft, 2 -4 Soft, 4 -8 M Stiff	Little 10 to 20%	ID SIZE (IN)	SS	
8 -15 Stiff, 15 -30 V. Stiff, 30 + Hard.	Some 20 to 35%	HAMMER WGT (LB)	140 lb.	
	And 35% to 50%	HAMMER FALL (IN)	30"	

TEST BORING LOG

SHEET 18

Soil Exploration Corp.
 Geotechnical Drilling
 Groundwater Monitor Well
 148 Pioneer Drive
 Leominster, MA 01453
 978 840-0391

Cardno ATC
 Site: **Proposed Condo Site**
Fisher Sreet
Foxboro, MA

BORING B-18

PROJECT NO. 14-1123

DATE: November 25, 2014

Ground Elevation:

Date Started: November 24, 2014

Date Finished: November 24, 2014

Driller: PG

Soil Engineer/Geologist:

GROUNDWATER OBSERVATIONS

DATE	DEPTH	CASING	STABILIZATION

Depth Ft.	Casing bl/ft	Sample				Strata	Visual Identification of Soil and / or Rock Sample
		No.	Pen/Rec	Depth	Blows/6"		
						3"	Topsoil
1		1	15"	0-2'0"	1-2-2-5	2'0"	Dry, brown, loose fine and coarse Sand, some silt, some fine to medium gravel, little organics. (Subsoil)
		2	12"	2'0"-4'0"	11-25-30-43		Dry, grey, very dense, fine to coarse Sand, some silt, some fine to medium gravel.
5		3	21	5'0"-7'0"	18-27-35-49		Dry, grey, very dense, fine to coarse Gravel, and fine to coarse sand, little silt.
		4	18"	7'0"-8'9"	39-61-49-100/3"		Dry, grey, very dense, fine to coarse Gravel, some fine to coarse sand, little silt, to Weathered Rock.
10						9'0"	End of boring at 9'0". Auger refusal.
15							
20							
25							
30							
35							
39							

Notes: Hollow Stem Auger Size - 4 1/4"

Cohesionless: 0 - 4 V. Loose, 4 - 10 Loose, 10 -30 M Dense, 30 -50 Dense, 50+ V Dense.	Trace	0 to 10%	CASING	SAMPLE	CORE TYPE
Cohesive: 0 -2 V Soft, 2 -4 Soft, 4 -8 M Stiff	Little	10 to 20%	ID SIZE (IN)	SS	
8 -15 Stiff, 15 -30 V. Stiff, 30 + Hard.	Some	20 to 35%	HAMMER WGT (LB)	140 lb.	
	And	35% to 50%	HAMMER FALL (IN)	30"	

TEST BORING LOG

SHEET 19

Soil Exploration Corp.
 Geotechnical Drilling
 Groundwater Monitor Well
 148 Pioneer Drive
 Leominster, MA 01453
 978 840-0391

Cardno ATC
 Site: **Proposed Condo Site**
Fisher Sreet
Foxboro, MA

BORING B-19

PROJECT NO. 14-1123

DATE: November 24, 2014

Ground Elevation:
 Date Started: November 21, 2014
 Date Finished: November 21, 2014
 Driller: GG
 Soil Engineer/Geologist: Antonio Rodrigues

GROUNDWATER OBSERVATIONS

DATE	DEPTH	CASING	STABILIZATION

Depth Ft.	Casing bl/ft	Sample				Strata	Visual Identification of Soil and / or Rock Sample
		No.	Pen/Rec	Depth	Blows/6"		
1		1	6"	0-2'0"	3-4-4-4	2'0"	Loose, dry fine to coarse Sand, some silt, some medium to fine gravel. (Topsoil & Subsoil)
5		2	10"	5'0"-6'1"	43-72-50/1"		Very dense, dry, fine to medium Gravel, and fine to coarse sand, little silt, to weathered rock.
10		3	4"	10'0"-10'6"	100/6"	10'6"	Weathered Rock
15							End of boring at 10'6". Refusal with spoon. No water encountered.
20							
25							
30							
35							
39							

Notes: Hollow Stem Auger Size - 4 1/4"

Cohesionless: 0 - 4 V. Loose, 4 - 10 Loose, 10 -30 M Dense, 30 -50 Dense, 50+ V Dense.	Trace 0 to 10%	CASING	SAMPLE	CORE TYPE
Cohesive: 0 -2 V Soft, 2 -4 Soft, 4 -8 M Stiff	Little 10 to 20%	ID SIZE (IN)	SS	
8 -15 Stiff, 15 -30 V. Stiff, 30 + Hard.	Some 20 to 35%	HAMMER WGT (LB)	140 lb.	
	And 35% to 50%	HAMMER FALL (IN)	30"	

TEST BORING LOG

SHEET 20

Soil Exploration Corp.
 Geotechnical Drilling
 Groundwater Monitor Well
 148 Pioneer Drive
 Leominster, MA 01453
 978 840-0391

Cardno ATC
 Site: **Proposed Condo Site**
 Fisher Sreet
 Foxboro, MA

BORING P-1

PROJECT NO. 14-1123

DATE: November 24, 2014

Ground Elevation:

Date Started: November 20, 2014

Date Finished: November 20, 2014

Driller: GG

Soil Engineer/Geologist:

GROUNDWATER OBSERVATIONS

DATE	DEPTH	CASING	STABILIZATION

Depth Ft.	Casing bl/ft	Sample				Strata	Visual Identification of Soil and / or Rock Sample
		No.	Pen/Rec	Depth	Blows/6"		
1		1	4"	0-2'0"	6-18-20-17	6"	Topsoil. Dense, dry, fine to coarse Gravel, some fine to coarse sand, little silt, little cobbles.
		2	3"	2'0"-4'0"	18-20-17-17		
5		3	3"	5'0"-7'0"	4-5-6-7	4'0"	Medium dense, dry, grey, fine to coarse Gravel, and fine to coarse sand, little silt.
						7'0"	
10		3	1"	10'0"-10'2"	60/2"	10'2"	Very dense, dry weathered rock.
15							End of boring at 10'2". Refusal with augers and spoon. No water encountered.
20							
25							
30							
35							
39							

Notes: Hollow Stem Auger Size - 4 1/4"

Cohesionless: 0 - 4 V. Loose, 4 - 10 Loose, 10 -30 M Dense, 30 -50 Dense, 50+ V Dense.	Trace	0 to 10%		CASING	SAMPLE	CORE TYPE
Cohesive: 0 -2 V Soft, 2 -4 Soft, 4 -8 M Stiff	Little	10 to 20%		ID SIZE (IN)	SS	
8 -15 Stiff, 15 -30 V. Stiff, 30 + Hard.	Some	20 to 35%		HAMMER WGT (LB)	140 lb.	
	And	35% to 50%		HAMMER FALL (IN)	30"	

TEST BORING LOG

SHEET 21

Soil Exploration Corp.
 Geotechnical Drilling
 Groundwater Monitor Well
 148 Pioneer Drive
 Leominster, MA 01453
 978 840-0391

Cardno ATC
Site: Proposed Condo Site
Fisher Sreet
Foxboro, MA

BORING P-2

PROJECT NO. 14-1123

DATE: November 24, 2014

Ground Elevation:

Date Started: November 21, 2014

Date Finished: November 21, 2014

Driller: GG

Soil Engineer/Geologist:

GROUNDWATER OBSERVATIONS

DATE	DEPTH	CASING	STABILIZATION

Depth Ft.	Casing bl/ft	Sample				Strata	Visual Identification of Soil and / or Rock Sample
		No.	Pen/Rec	Depth	Blows/6"		
1		1	2"	0-2'0"	3-5-5-4		Loose, dry fine to coarse Sand, some silt, some medium to fine gravel. (Topsoil & Subsoil)
		2	4"	2'0"-3'1"	7-18-50/1"		2'0"
5		3	6"	5'0"-6'1"	19-42-50/1"	3'0"	Very dense, dry weathered rock.
10						9'0"	End of boring at 9'0". Refusal with augers. No water encountered.
15							
20							
25							
30							
35							
39							

Notes: Hollow Stem Auger Size - 4 1/4"

Cohesionless: 0 - 4 V. Loose, 4 - 10 Loose, 10 -30 M Dense, 30 -50 Dense, 50+ V Dense.	Trace	0 to 10%			CASING	SAMPLE	CORE TYPE
Cohesive: 0 -2 V Soft, 2 -4 Soft, 4 -8 M Stiff	Little	10 to 20%			ID SIZE (IN)	SS	
8 -15 Stiff, 15 -30 V. Stiff, 30 + Hard.	Some	20 to 35%			HAMMER WGT (LB)	140 lb.	
	And	35% to 50%			HAMMER FALL (IN)	30"	

TEST BORING LOG

SHEET 22

Soil Exploration Corp.
 Geotechnical Drilling
 Groundwater Monitor Well
 148 Pioneer Drive
 Leominster, MA 01453
 978 840-0391

Cardno ATC
 Site: **Proposed Condo Site**
Fisher Sreet
Foxboro, MA

BORING P-3

PROJECT NO. 14-1123

DATE: November 24, 2014

Ground Elevation:

Date Started: November 20, 2014

Date Finished: November 20, 2014

Driller: GG

Soil Engineer/Geologist: Antonio Rodrigues

GROUNDWATER OBSERVATIONS

DATE	DEPTH	CASING	STABILIZATION

Depth Ft.	Casing bl/ft	Sample				Strata	Visual Identification of Soil and / or Rock Sample
		No.	Pen/Rec	Depth	Blows/6"		
1		1	6"	0-1'0"	8-14	1'0"	Loose, dry fine to coarse Sand, some silt, some medium to fine gravel. (Topsoil & Subsoil)
		1A	2"	1'0"-2'0"	4-4		
		2	8"	2'0"-4'0"	4-4-6-35		
5		3	7"	5'0"-6'0"	9-60/6"	5'6"	Medium dense, dry, grey, fine to coarse Sand, and silt, and fine to medium gravel
10		4	3"	10'0"-10'3"	50/3"	10'3"	Very dense, dry weathered rock.
15							End of boring at 10'3". Refusal with augers and spoon. No water encountered.
20							
25							
30							
35							
39							

Notes: Hollow Stem Auger Size - 4 1/4"

Cohesionless: 0 - 4 V. Loose, 4 - 10 Loose, 10 -30 M Dense, 30 -50 Dense, 50+ V Dense.	Trace	0 to 10%	CASING	SAMPLE	CORE TYPE
Cohesive: 0 -2 V Soft, 2 -4 Soft, 4 -8 M Stiff	Little	10 to 20%	ID SIZE (IN)	SS	
8 -15 Stiff, 15 -30 V. Stiff, 30 + Hard.	Some	20 to 35%	HAMMER WGT (LB)	140 lb.	
	And	35% to 50%	HAMMER FALL (IN)	30"	

TEST BORING LOG

SHEET 23

Soil Exploration Corp.
 Geotechnical Drilling
 Groundwater Monitor Well
 148 Pioneer Drive
 Leominster, MA 01453
 978 840-0391

Cardno ATC
 Site: **Proposed Condo Site**
Fisher Sreet
Foxboro, MA

BORING P-4

PROJECT NO. 14-1123

DATE: November 24, 2014

Ground Elevation:

Date Started: November 20, 2014

Date Finished: November 20, 2014

Driller: GG

Soil Engineer/Geologist: Antonio Rodrigues

GROUNDWATER OBSERVATIONS

DATE	DEPTH	CASING	STABILIZATION

Depth Ft.	Casing bl/ft	Sample				Strata	Visual Identification of Soil and / or Rock Sample
		No.	Pen/Rec	Depth	Blows/6"		
1		1	8"	0-2'0"	2-4-6-7	2'0"	Loose, dry fine to coarse Sand, some silt, some medium to fine gravel. (Topsoil & Subsoil)
		2		2'0"-3'0"	16-50/6"		
5		3	16"	5'0"-7'0"	20-30-30-30	7'0"	Medium dense to very dense, dry, fine to coarse Sand, and silt, some fine to medium gravel, trace cobbles.
		4	17"	10'0"-12'0"	5-8-8-8	12'0"	Very dense to medium dense, dry weathered rock.
10							End of boring at 12'0". No water encountered.
15							
20							
25							
30							
35							
39							

Notes: Hollow Stem Auger Size - 4 1/4"

Cohesionless: 0 - 4 V. Loose, 4 - 10 Loose, 10 -30 M Dense, 30 -50 Dense, 50+ V Dense.	Trace	0 to 10%		CASING	SAMPLE	CORE TYPE
Cohesive: 0 -2 V Soft, 2 -4 Soft, 4 -8 M Stiff	Little	10 to 20%		ID SIZE (IN)	SS	
8 -15 Stiff, 15 -30 V. Stiff, 30 + Hard.	Some	20 to 35%		HAMMER WGT (LB)	140 lb.	
	And	35% to 50%		HAMMER FALL (IN)	30"	

TEST BORING LOG

SHEET 24

Soil Exploration Corp.
 Geotechnical Drilling
 Groundwater Monitor Well
 148 Pioneer Drive
 Leominster, MA 01453
 978 840-0391

Cardno ATC
 Site: **Proposed Condo Site**
Fisher Sreet
Foxboro, MA

BORING P-5

PROJECT NO. 14-1123

DATE: December 1, 2014

Ground Elevation:

Date Started: November 26, 2014

Date Finished: November 26, 2014

Driller: PG

Soil Engineer/Geologist:

GROUNDWATER OBSERVATIONS

DATE	DEPTH	CASING	STABILIZATION

Depth Ft.	Casing bl/ft	Sample				Strata	Visual Identification of Soil and / or Rock Sample
		No.	Pen/Rec	Depth	Blows/6"		
1		1	9"	0-2'0"	1-1-2-1	6"	Topsoil Dry, brown, very loose, dry fine to coarse Sand, some silt, some medium to fine gravel, trace organics. (Subsoil)
		2	12"	2'0"-4'0"	3-7-31-35	2'6"	Dry, grey, medium dense, fine and coarse Sand, some silt, some fine to medium gravel.
5		3	15"	5'0"-7'0"	10-37-61-57		Dry, grey, medium dense, fine and coarse Sand, some silt, some fine to medium gravel.
10						9'0"	End of boring at 9'0". Auger refusal.
15							
20							
25							
30							
35							
39							

Notes: Hollow Stem Auger Size - 4 1/4"

Cohesionless: 0 - 4 V. Loose, 4 - 10 Loose, 10 -30 M Dense, 30 -50 Dense, 50+ V Dense.	Trace 0 to 10%	CASING	SAMPLE	CORE TYPE
Cohesive: 0 -2 V Soft, 2 -4 Soft, 4 -8 M Stiff	Little 10 to 20%	ID SIZE (IN)	SS	
8 -15 Stiff, 15 -30 V. Stiff, 30 + Hard.	Some 20 to 35%	HAMMER WGT (LB)	140 lb.	
	And 35% to 50%	HAMMER FALL (IN)	30"	

TEST BORING LOG

SHEET 25

Soil Exploration Corp.
 Geotechnical Drilling
 Groundwater Monitor Well
 148 Pioneer Drive
 Leominster, MA 01453
 978 840-0391

Cardno ATC
 Site: **Proposed Condo Site**
Fisher Sreet
Foxboro, MA

BORING P-6

PROJECT NO. 14-1123

DATE: December 1, 2014

Ground Elevation:
 Date Started: November 25, 2014
 Date Finished: November 25, 2014
 Driller: PG
 Soil Engineer/Geologist: Antonio Rodrigues

GROUNDWATER OBSERVATIONS

DATE	DEPTH	CASING	STABILIZATION

Depth Ft.	Casing bl/ft	Sample				Strata	Visual Identification of Soil and / or Rock Sample
		No.	Pen/Rec	Depth	Blows/6"		
1		1	3"	0-2'0"	1-3-6-7	8"	Topsoil.
		2	9"	2'0"-4'0"	7-7-12-14		Dry, brown, loose, fine and coarse Gravel, and fine to coarse sand, little silt.
		3	6"	5'0"-5'10"	29-100/4"		Dry, grey, medium dense, fine to coarse Gravel, some fine to coarse sand, little silt.
5							Dry, grey, very dense, fine to coarse gravel, and fine to coarse sand, little silt, to weathered rock
10						10'0"	End of boring at 10'0". Auger refusal.
15							
20							
25							
30							
35							
39							

Notes: Hollow Stem Auger Size - 4 1/4"

Cohesionless: 0 - 4 V. Loose, 4 - 10 Loose, 10 -30 M Dense, 30 -50 Dense, 50+ V Dense.	Trace	0 to 10%			CASING	SAMPLE	CORE TYPE
Cohesive: 0 -2 V Soft, 2 -4 Soft, 4 -8 M Stiff	Little	10 to 20%			ID SIZE (IN)	SS	
8 -15 Stiff, 15 -30 V. Stiff, 30 + Hard.	Some	20 to 35%			HAMMER WGT (LB)	140 lb.	
	And	35% to 50%			HAMMER FALL (IN)	30"	

TEST BORING LOG

SHEET 26

Soil Exploration Corp.
 Geotechnical Drilling
 Groundwater Monitor Well
 148 Pioneer Drive
 Leominster, MA 01453
 978 840-0391

Cardno ATC
 Site: **Proposed Condo Site**
Fisher Sreet
Foxboro, MA

BORING P-7

PROJECT NO. 14-1123

DATE: December 1, 2014

Ground Elevation:

Date Started: November 25, 2014

Date Finished: November 25, 2014

Driller: PG

Soil Engineer/Geologist:

GROUNDWATER OBSERVATIONS

DATE	DEPTH	CASING	STABILIZATION

Depth Ft.	Casing bl/ft	Sample				Strata	Visual Identification of Soil and / or Rock Sample
		No.	Pen/Rec	Depth	Blows/6"		
1		1	9"	0-2'0"	1-3-2-5	4"	Topsoil Loose, dry, brown, fine to coarse Sand, some silt, some medium to fine gravel, trace organics (Subsoil)
5		2	15"	2'0"-4'0"	20-44-57-71	2'0"	Dry, grey, very dense, fine to coarse Gravel, some fine to coarse sand, little silt.
10		3	9"	5'0"-5'11"	34-100/5"		Dry, grey, very dense, fine to coarse Sand, little silt, little fine to coarse gravel.
15		4	6"	10'0"-10'7"	68-100/1"	10'7"	Dry, grey, very dense, medium and fine Gravel, and fine to coarse sand, little silt End of boring at 10'7". Spoon refusal.
20							
25							
30							
35							
39							

Notes: Hollow Stem Auger Size - 4 1/4"

Cohesionless: 0 - 4 V. Loose, 4 - 10 Loose, 10 -30 M Dense, 30 -50 Dense, 50+ V Dense.	Trace	0 to 10%	CASING	SAMPLE	CORE TYPE
Cohesive: 0 -2 V Soft, 2 -4 Soft, 4 -8 M Stiff	Little	10 to 20%	ID SIZE (IN)		SS
8 -15 Stiff, 15 -30 V. Stiff, 30 + Hard.	Some	20 to 35%	HAMMER WGT (LB)		140 lb.
	And	35% to 50%	HAMMER FALL (IN)		30"

TEST BORING LOG

SHEET 27

Soil Exploration Corp.
 Geotechnical Drilling
 Groundwater Monitor Well
 148 Pioneer Drive
 Leominster, MA 01453
 978 840-0391

Cardno ATC
 Site: **Proposed Condo Site**
Fisher Sreet
Foxboro, MA

BORING P-8

PROJECT NO. 14-1123

DATE: November 25, 2014

Ground Elevation:

Date Started: November 24, 2014

Date Finished: November 24, 2014

Driller: PG

Soil Engineer/Geologist: Antonio Rodrigues

GROUNDWATER OBSERVATIONS

DATE	DEPTH	CASING	STABILIZATION

Depth Ft.	Casing bl/ft	Sample				Strata	Visual Identification of Soil and / or Rock Sample
		No.	Pen/Rec	Depth	Blows/6"		
1		1	6"	0-2'0"	WTH-11-2	2'0"	Dry, brown, loose, fine sand and silt, trace fine gravel, trace organics (Topsoil & Subsoil).
		2	12"	2'0"-4'0"	13-18-27-33		Dry, grey, dense, fine to coarse Gravel, some fine to coarse sand, little silt.
5		3	15"	5'0"-7'0"	36-41-62-71	8'0"	Dry, grey, very dense, fine to medium gravel, and fine to coarse sand, little silt.
10							End of boring at 8'0". Auger refusal.
15							
20							
25							
30							
35							
39							

Notes: Hollow Stem Auger Size - 4 1/4"

Cohesionless: 0 - 4 V. Loose, 4 - 10 Loose, 10 -30 M Dense, 30 -50 Dense, 50+ V Dense.	Trace 0 to 10%		CASING	SAMPLE	CORE TYPE
Cohesive: 0 -2 V Soft, 2 -4 Soft, 4 -8 M Stiff	Little 10 to 20%		ID SIZE (IN)	SS	
8 -15 Stiff, 15 -30 V. Stiff, 30 + Hard.	Some 20 to 35%		HAMMER WGT (LB)	140 lb.	
	And 35% to 50%		HAMMER FALL (IN)	30"	

TEST BORING LOG

SHEET 28

Soil Exploration Corp.
 Geotechnical Drilling
 Groundwater Monitor Well
 148 Pioneer Drive
 Leominster, MA 01453
 978 840-0391

Cardno ATC
 Site: **Proposed Condo Site**
Fisher Sreet
Foxboro, MA

BORING P-9

PROJECT NO. 14-1123

DATE: November 25, 2014

Ground Elevation:

Date Started: November 24, 2014

Date Finished: November 24, 2014

Driller: PG

Soil Engineer/Geologist: Antonio Rodrigues

GROUNDWATER OBSERVATIONS

DATE	DEPTH	CASING	STABILIZATION

Depth Ft.	Casing bl/ft	Sample				Strata	Visual Identification of Soil and / or Rock Sample
		No.	Pen/Rec	Depth	Blows/6"		
						3"	Topsoil
1		1	12"	0-2'0"	8-9-3-4		Dry, brown, Loose, fine to coarse Sand, some silt, trace fine gravel, trace cobbles. (Subsoil)
		2	12"	2'0"-4'0"	11-23-19-31	2'0"	Dry, grey, dense, fine to coarse Gravel and ine to coarse sand, little silt.
5		3	18"	5'0"-7'0"	33-38-41-68		Dry, grey, very dense, fine to coarse Sand, some silt, some fine to medium gravel.
		4	3"	7'0"-7'5"	100/5"	7'6"	Dry, grey, very dense, fine to coarse Sand, some silt, some fine to coarse gravel to weathered rock
10							End of boring at 7'6". Auger refusal.
15							
20							
25							
30							
35							
39							

Notes: Hollow Stem Auger Size - 4 1/4"

Cohesionless: 0 - 4 V. Loose, 4 - 10 Loose, 10 -30 M Dense, 30 -50 Dense, 50+ V Dense.	Trace 0 to 10%	CASING	SAMPLE	CORE TYPE
Cohesive: 0 -2 V Soft, 2 -4 Soft, 4 -8 M Stiff	Little 10 to 20%	ID SIZE (IN)	SS	
8 -15 Stiff, 15 -30 V. Stiff, 30 + Hard.	Some 20 to 35%	HAMMER WGT (LB)	140 lb.	
	And 35% to 50%	HAMMER FALL (IN)	30"	

TEST BORING LOG

SHEET 29

Soil Exploration Corp.
 Geotechnical Drilling
 Groundwater Monitor Well
 148 Pioneer Drive
 Leominster, MA 01453
 978 840-0391

Cardno ATC
 Site: **Proposed Condo Site**
Fisher Sreet
Foxboro, MA

BORING P-10

PROJECT NO. 14-1123

DATE: November 24, 2014

Ground Elevation:

Date Started: November 21, 2014

Date Finished: November 21, 2014

Driller: GG

Soil Engineer/Geologist: Antonio Rodrigues

GROUNDWATER OBSERVATIONS

DATE	DEPTH	CASING	STABILIZATION

Depth Ft.	Casing bl/ft	Sample				Strata	Visual Identification of Soil and / or Rock Sample
		No.	Pen/Rec	Depth	Blows/6"		
1		1	6"	0-2'0"	2-2-2-2	2'0"	Loose, dry fine to coarse Sand, some silt, some medium to fine gravel. (Topsoil & Subsoil)
		2	12"	2'0"-4'0"	4-15-28-35		Very dense, dry, fine to coarse Gravel, some fine to coarse sand, little silt, trace cobbles.
5		3	3"	5'0"-5'8"	22-50/2"	5'0" 6'0"	Very dense, dry weathered rock
10							End of boring at 6'0". Refusal with augers. No water encountered.
15							
20							
25							
30							
35							
39							

Notes: Hollow Stem Auger Size - 4 1/4"

Cohesionless: 0 - 4 V. Loose, 4 - 10 Loose, 10 -30 M Dense, 30 -50 Dense, 50+ V Dense.	Trace 0 to 10%	CASING	SAMPLE	CORE TYPE
Cohesive: 0 -2 V Soft, 2 -4 Soft, 4 -8 M Stiff	Little 10 to 20%	ID SIZE (IN)	SS	
8 -15 Stiff, 15 -30 V. Stiff, 30 + Hard.	Some 20 to 35%	HAMMER WGT (LB)	140 lb.	
	And 35% to 50%	HAMMER FALL (IN)	30"	

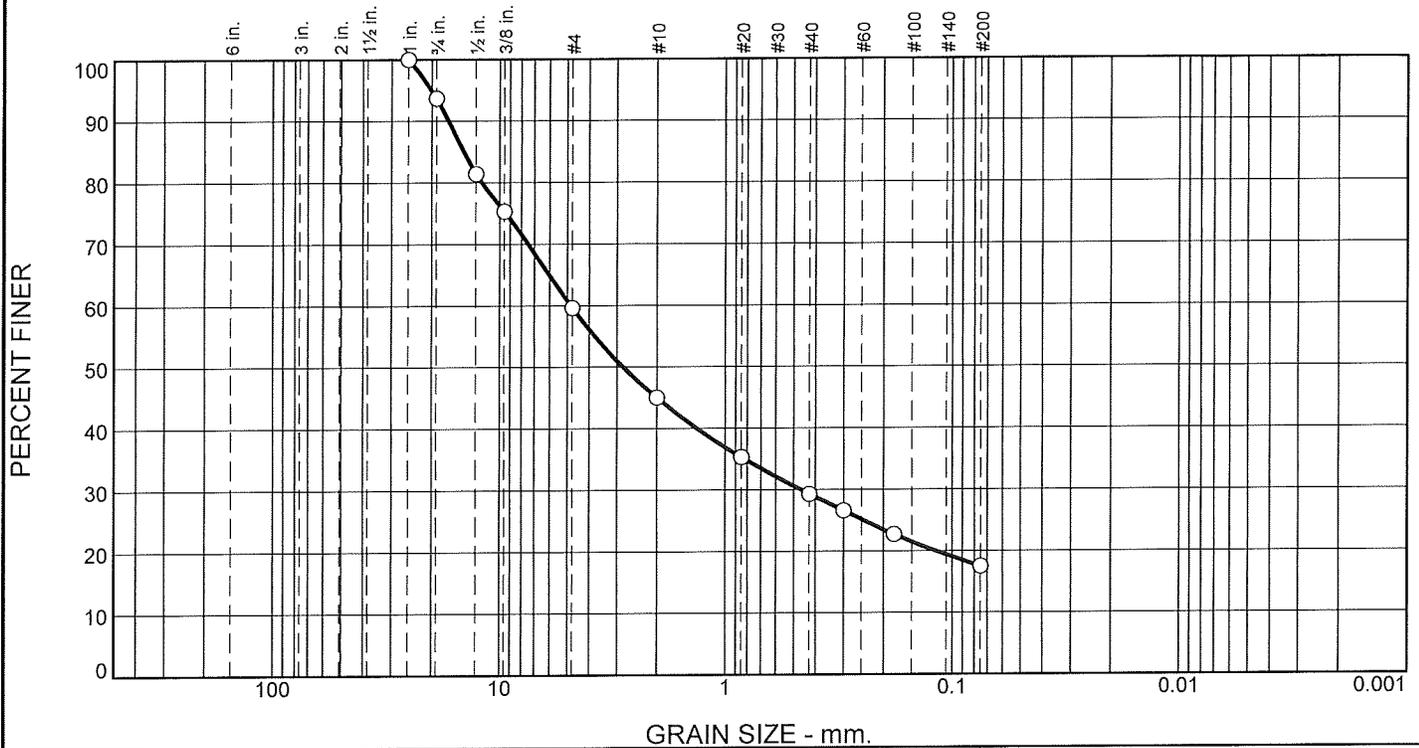


Cardno[®]
ATC

Shaping the Future

Laboratory Test Results

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	6.3	34.1	14.6	15.7	11.8	17.5	

TEST RESULTS			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
1"	100.0		
3/4"	93.7		
1/2"	81.4		
3/8"	75.3		
#4	59.6		
#10	45.0		
#20	35.3		
#40	29.3		
#50	26.6		
#80	22.7		
#200	17.5		

Material Description

med to fine GRAVEL and, coarse to fine Sand, little Silt

Atterberg Limits (ASTM D 4318)

PL= _____ LL= _____ PI= _____

Classification

USCS (D 2487)= _____ AASHTO (M 145)= _____

Coefficients

D₉₀= 16.8173 D₈₅= 14.3814 D₆₀= 4.8387
D₅₀= 2.8233 D₃₀= 0.4641 D₁₅= _____
D₁₀= _____ C_u= _____ C_c= _____

Remarks

Date Received: _____ Date Tested: 12/12/14
Tested By: Jon Nutting
Checked By: Antonio Rodrigues
Title: Field Manager

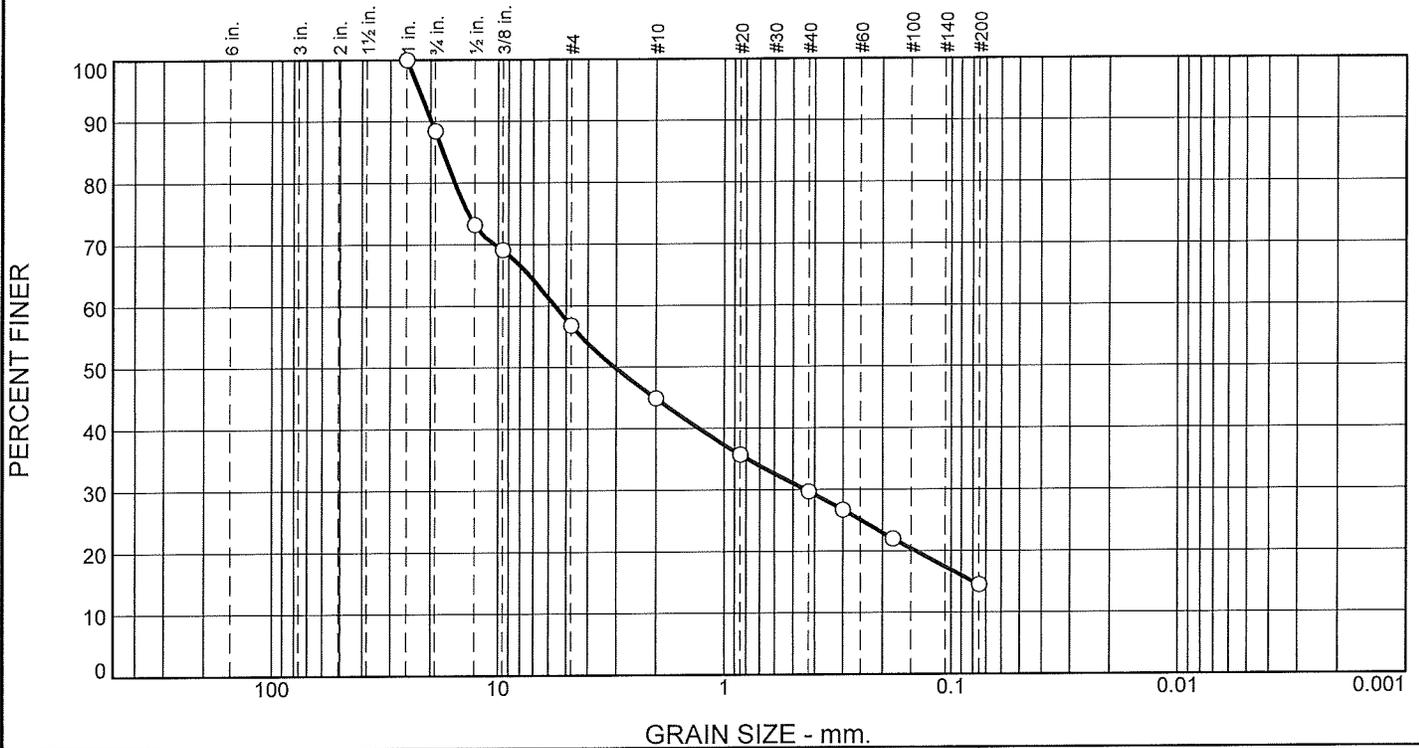
* (no specification provided)

Location: B-7, S-3
Sample Number: 855b Depth: 5'-6'

Date Sampled: 11/26/14

<p style="font-size: 1.2em; margin: 0;">ATC ASSOCIATES, INC.</p> <p style="margin: 0;">Avon, Massachusetts</p>	<p>Client: The Hanover Company</p> <p>Project: Lot 114 Fisher St. Foxboro, MA</p> <p>Project No: 25.19006.0018</p>
<p>Figure 2</p>	

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	11.6	31.6	11.9	15.2	15.2	14.5	

TEST RESULTS			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
1"	100.0		
3/4"	88.4		
1/2"	73.2		
3/8"	69.1		
#4	56.8		
#10	44.9		
#20	35.7		
#40	29.7		
#50	26.7		
#80	22.0		
#200	14.5		

Material Description

med to fine GRAVEL and, coarse to fine Sand, little Silt

Atterberg Limits (ASTM D 4318)

PL= _____ LL= _____ PI= _____

Classification

USCS (D 2487)= _____ AASHTO (M 145)= _____

Coefficients

D₉₀= 19.7907 D₈₅= 17.5954 D₆₀= 5.6241
D₅₀= 3.0490 D₃₀= 0.4405 D₁₅= 0.0797
D₁₀= _____ C_u= _____ C_c= _____

Remarks

Date Received: _____ Date Tested: 12/12/14
Tested By: Jon Nutting
Checked By: Antonio Rodrigues
Title: Field Manager

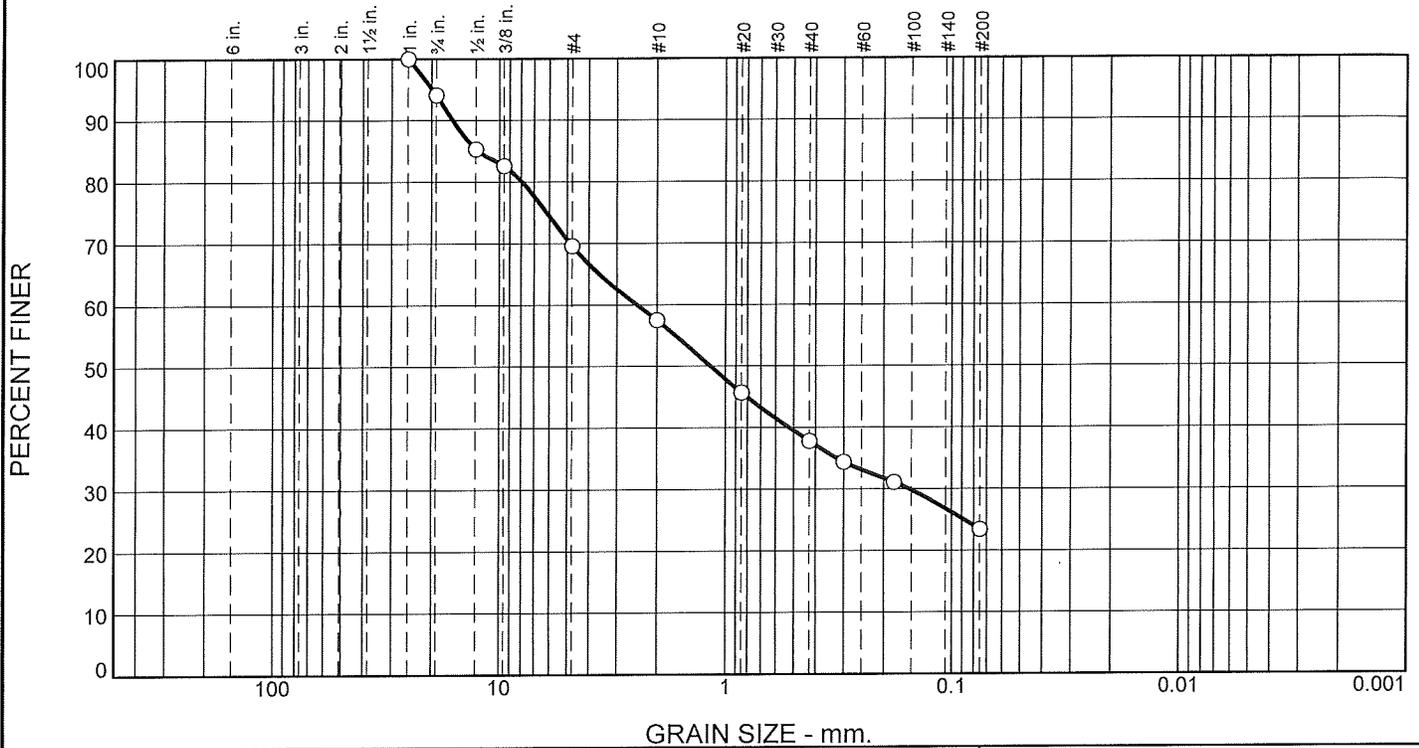
* (no specification provided)

Location: B-8, S-2
Sample Number: 855d Depth: 5'-5'10"

Date Sampled: 11/26/14

<p style="font-size: 1.2em; margin: 0;">ATC ASSOCIATES, INC.</p> <p style="margin: 0;">Avon, Massachusetts</p>	<p>Client: The Hanover Company Project: Lot 114 Fisher St. Foxboro, MA Project No: 25.19006.0018</p>
<p>Figure 4</p>	

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	5.9	24.5	12.1	19.7	14.4	23.4	

TEST RESULTS			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
1"	100.0		
3/4"	94.1		
1/2"	85.3		
3/8"	82.6		
#4	69.6		
#10	57.5		
#20	45.7		
#40	37.8		
#50	34.4		
#80	31.1		
#200	23.4		

Material Description

coarse to fine Sand, some Silt, and med to fine Gravel

Atterberg Limits (ASTM D 4318)

PL= _____ LL= _____ PI= _____

Classification

USCS (D 2487)= _____ AASHTO (M 145)= _____

Coefficients

D₉₀= 16.0615 D₈₅= 12.4137 D₆₀= 2.4472
D₅₀= 1.1645 D₃₀= 0.1543 D₁₅= _____
D₁₀= _____ C_u= _____ C_c= _____

Remarks

Date Received: 11/26/14 Date Tested: 12/12/14
Tested By: Jon Nutting
Checked By: Antonio Rodrigues
Title: Field Manager

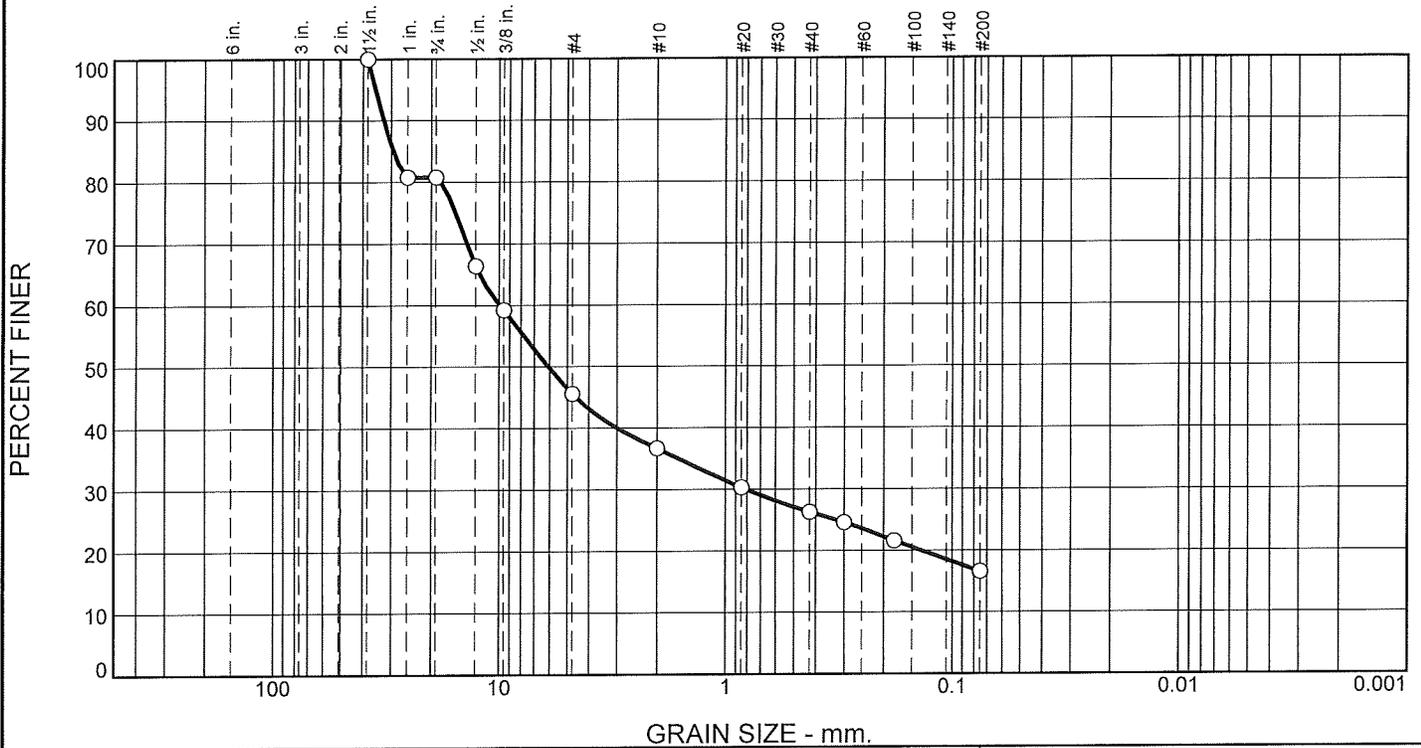
* (no specification provided)

Location: B-11, S-3
Sample Number: 855e Depth: 10'-12'

Date Sampled:

<p style="font-size: 1.2em; margin: 0;">ATC ASSOCIATES, INC.</p> <p style="margin: 0;">Avon, Massachusetts</p>	<p>Client: The Hanover Company</p> <p>Project: Lot 114 Fisher St. Foxboro, MA</p> <p>Project No: 25.19006.0018</p>
<p>Figure 5</p>	

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	19.2	35.2	8.9	10.4	9.7	16.6	

TEST RESULTS			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
1 1/2"	100.0		
1"	80.8		
3/4"	80.8		
1/2"	66.4		
3/8"	59.2		
#4	45.6		
#10	36.7		
#20	30.3		
#40	26.3		
#50	24.6		
#80	21.6		
#200	16.6		

Material Description

coarse to fine GRAVEL and, coarse to fine Sand, little Silt

Atterberg Limits (ASTM D 4318)

PL= _____ LL= _____ PI= _____

Classification

USCS (D 2487)= _____ AASHTO (M 145)= _____

Coefficients

D₉₀= 32.4114 D₈₅= 29.3427 D₆₀= 9.9122
D₅₀= 6.0759 D₃₀= 0.8126 D₁₅= _____
D₁₀= _____ C_u= _____ C_c= _____

Remarks

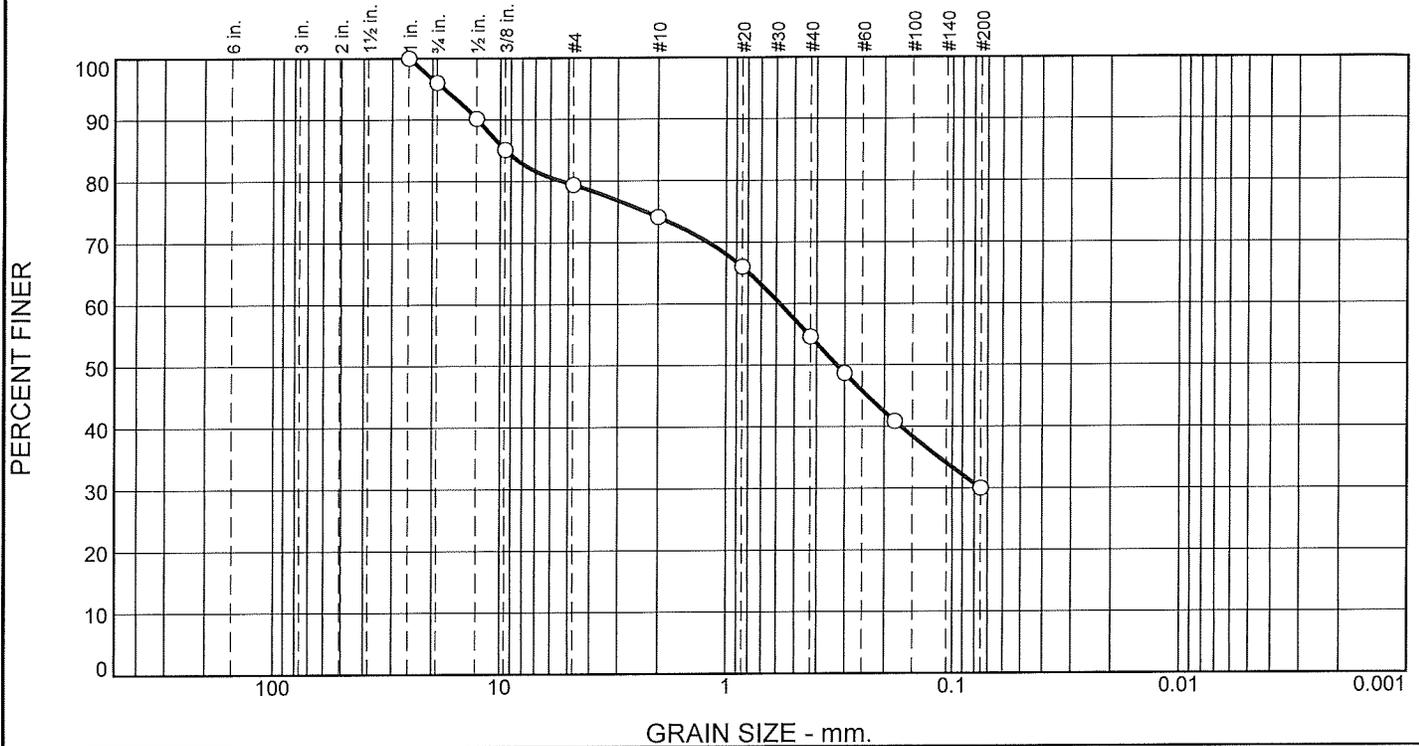
Date Received: 11/26/14 Date Tested: 12/12/14
Tested By: Jon Nutting
Checked By: Antonio Rodrigues
Title: Field Manager

* (no specification provided)

Location: B-13, S-3 Depth: 10'-12'
Sample Number: 855f

Date Sampled:

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	4.0	16.6	5.3	19.5	24.6	30.0	

TEST RESULTS			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
1"	100.0		
3/4"	96.0		
1/2"	90.2		
3/8"	85.1		
#4	79.4		
#10	74.1		
#20	66.0		
#40	54.6		
#50	48.7		
#80	40.9		
#200	30.0		

Material Description

coarse to fine Sand, some Silt, some med to fine Gravel

Atterberg Limits (ASTM D 4318)

PL= _____ LL= _____ PI= _____

Classification

USCS (D 2487)= _____ AASHTO (M 145)= _____

Coefficients

D₉₀= 12.5535 D₈₅= 9.4638 D₆₀= 0.5790
D₅₀= 0.3246 D₃₀= 0.0750 D₁₅= _____
D₁₀= _____ C_u= _____ C_c= _____

Remarks _____

Date Received: 11/26/14 Date Tested: 12/12/14
Tested By: Jon Nutting
Checked By: Antonio Rodrigues
Title: Field Manager

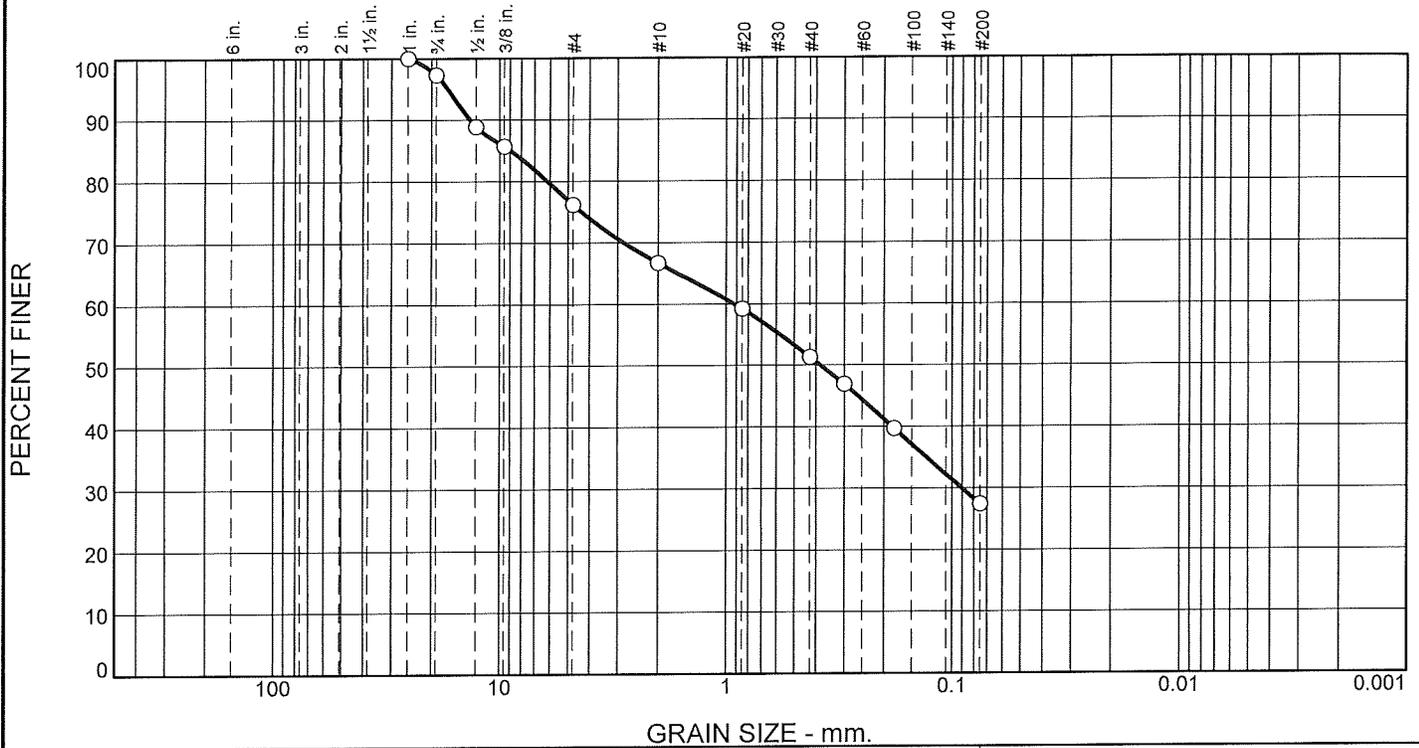
* (no specification provided)

Location: B-14, S-1 Depth: 0'-2'

Date Sampled: _____

<p style="font-size: 1.2em; margin: 0;">ATC ASSOCIATES, INC.</p> <p style="margin: 0;">Avon, Massachusetts</p>	<p>Client: The Hanover Company</p> <p>Project: Lot 114 Fisher St. Foxboro, MA</p> <p>Project No: 25.19006.0018</p>
<p>Figure 7</p>	

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	2.7	21.1	9.5	15.4	23.9	27.4	

TEST RESULTS			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
1"	100.0		
3/4"	97.3		
1/2"	88.9		
3/8"	85.7		
#4	76.2		
#10	66.7		
#20	59.2		
#40	51.3		
#50	46.9		
#80	39.7		
#200	27.4		

Material Description

coarse to fine Sand, some Silt, some med to fine Gravel

Atterberg Limits (ASTM D 4318)

PL= _____ LL= _____ PI= _____

Classification

USCS (D 2487)= _____ AASHTO (M 145)= _____

Coefficients

D₉₀= 13.4900 D₈₅= 8.9152 D₆₀= 0.9227
D₅₀= 0.3824 D₃₀= 0.0904 D₁₅= _____
D₁₀= _____ C_u= _____ C_c= _____

Remarks

Date Received: 11/26/14 Date Tested: 12/12/14
Tested By: Jon Nutting
Checked By: Antonio Rodrigues
Title: Field Manager

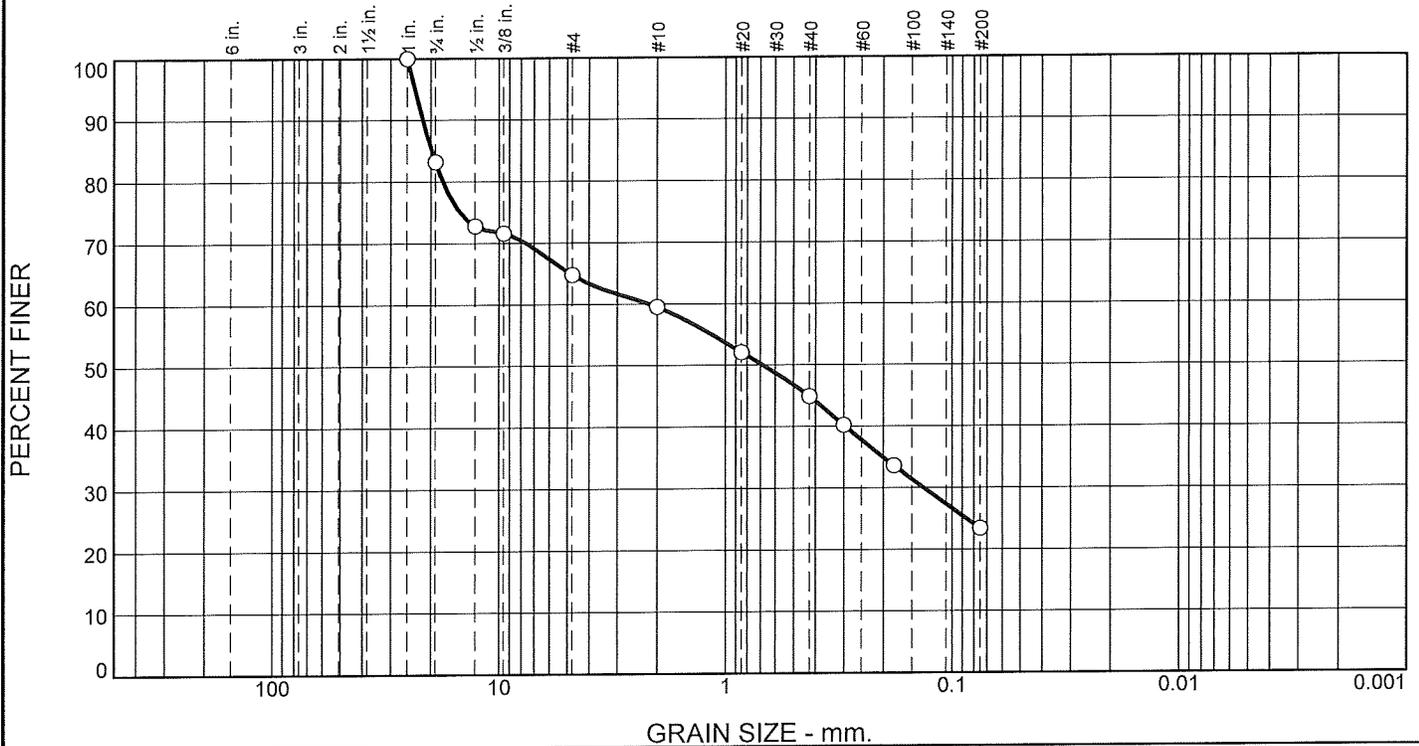
* (no specification provided)

Location: B-14, S-4 Depth: 7'-9'

Date Sampled:

<p style="font-size: 1.2em; font-weight: bold; margin: 0;">ATC ASSOCIATES, INC.</p> <p style="font-weight: bold; margin: 5px 0 0 0;">Avon, Massachusetts</p>	<p>Client: The Hanover Company Project: Lot 114 Fisher St. Foxboro, MA Project No: 25.19006.0018</p>
<p>Figure 8</p>	

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	16.8	18.4	5.3	14.6	21.5	23.4	

TEST RESULTS			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
1"	100.0		
3/4"	83.2		
1/2"	72.8		
3/8"	71.6		
#4	64.8		
#10	59.5		
#20	52.1		
#40	44.9		
#50	40.2		
#80	33.6		
#200	23.4		

* (no specification provided)

Material Description

coarse to fine Sand, some Silt, and med to fine Gravel

Atterberg Limits (ASTM D 4318)

PL= _____ LL= _____ PI= _____

Classification

USCS (D 2487)= _____ AASHTO (M 145)= _____

Coefficients

D₉₀= 21.6430 D₈₅= 19.7663 D₆₀= 2.1752
D₅₀= 0.6819 D₃₀= 0.1333 D₁₅= _____
D₁₀= _____ C_u= _____ C_c= _____

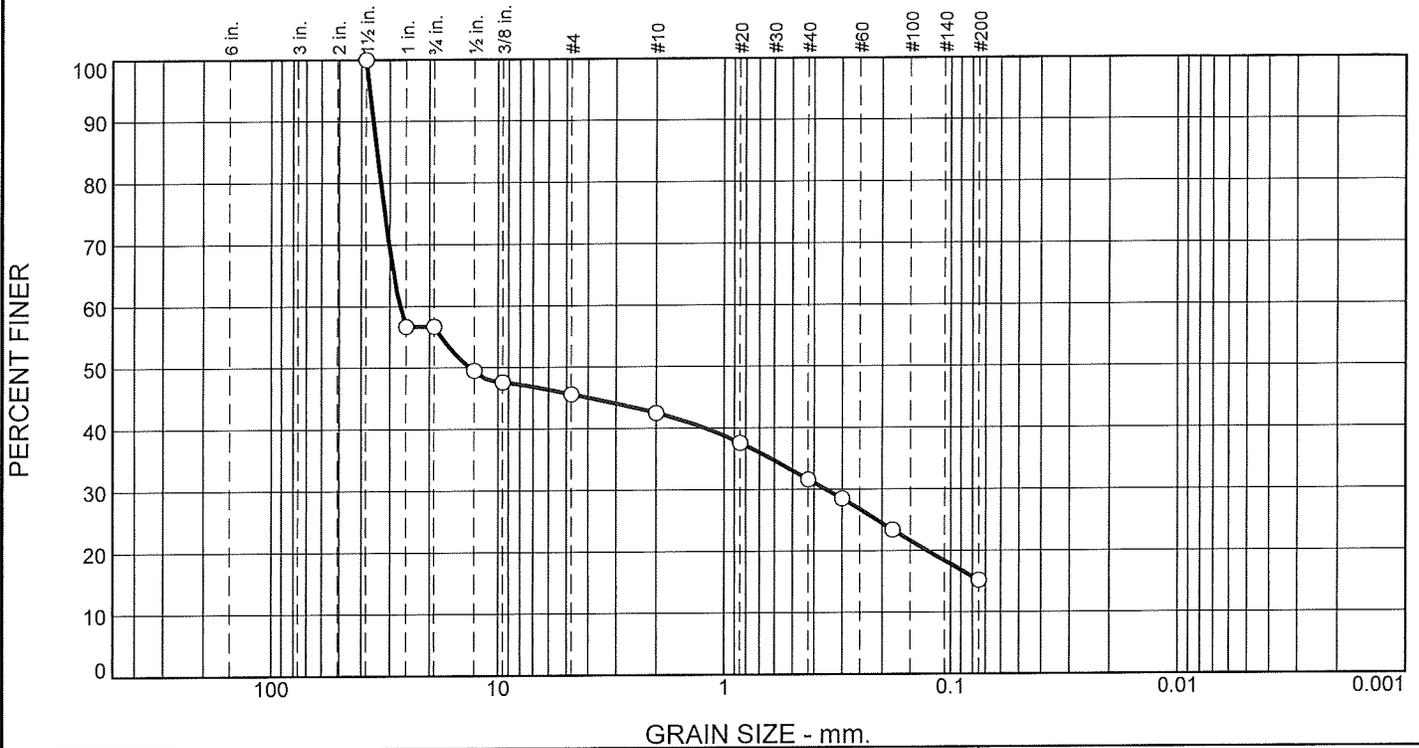
Remarks

Date Received: 11/26/14 Date Tested: 12/12/14
Tested By: Jon Nutting
Checked By: Antonio Rodrigues
Title: Field Manager

Location: B-18, S-1
Sample Number: 855j Depth: 0'-2'

Date Sampled:

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	43.3	11.1	3.1	10.9	16.4	15.2	

TEST RESULTS			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
1 1/2"	100.0		
1"	56.7		
3/4"	56.7		
1/2"	49.5		
3/8"	47.6		
#4	45.6		
#10	42.5		
#20	37.6		
#40	31.6		
#50	28.5		
#80	23.4		
#200	15.2		

Material Description

coarse to med GRAVEL and, coarse to fine Sand, little Silt

Atterberg Limits (ASTM D 4318)

PL= _____ LL= _____ PI= _____

Classification

USCS (D 2487)= _____ AASHTO (M 145)= _____

Coefficients

D₉₀= 35.4730 D₈₅= 34.1919 D₆₀= 27.0251
D₅₀= 13.2446 D₃₀= 0.3542 D₁₅= _____
D₁₀= _____ C_u= _____ C_c= _____

Remarks

Date Received: 11/26/14 Date Tested: 12/12/14
Tested By: Jon Nutting
Checked By: Antonio Rodrigues
Title: Field Manager

* (no specification provided)

Location: P-2, S-2
Sample Number: 855k Depth: 2'-3'1"

Date Sampled:

