

December 3, 2019

Ms. Amy J. Dunlap, LEEP AP BD+C
HKT Architects
24 Roland Street, Suite 301
Charlestown, MA 02129

RE: **Supplemental Geotechnical Site Evaluation – Bedrock Probes
Ashland Public Safety Complex
12 Union Street
Ashland, Massachusetts
(Pare Project 17044.03)**

Dear Ms. Dunlap:

The following report presents the findings of the bedrock probe subsurface investigation completed by Pare Corporation (Pare) at the proposed site for the new public safety building located between 12-16 Union Street and 1 East Union Street in Ashland, Massachusetts. In accordance with our approved scope of services, this subsurface investigation was performed as part of the supplementary investigation program at the site. In view of the ground conditions encountered during the feasibility-level subsurface investigation previously performed at the site, this supplementary subsurface investigation was undertaken to further investigate the presence of boulders and depth to bedrock across the site. Presence of boulders and shallow bedrock across the site will likely impact the building elevation and excavations. In addition, rock removal will increase the cost of construction.

This study did not include an evaluation of the site for the presence of contamination or other environmental concerns, as those tasks are outside of Pare’s proposed scope of services for this investigation.

This letter report has been prepared in general accordance with our proposal and is subject to the Geotechnical Limitations presented in Appendix B.

EXISTING CONDITIONS

The proposed public safety complex is located along the south side of Union Street and East Union Street in Ashland, Massachusetts. The site is currently undeveloped and occupied by trees and brush. Areas of wetland are located to the southeast and southwest of the site. The existing site elevation increases from west to east and from north to south with elevation ranging from El. 188 feet to El. 223 feet based on survey plan titled “Plan of Registered Land 1 East Union Street and 12-16 Union Street (Route 135), Middlesex County, Ashland, Mass.” prepared by Guerriere & Halnon, Inc. of Milford, MA, dated November 01,2019. Piles of boulders and isolated boulders were observed in the northwestern portion of the site.

APPROACH

South Shore Drilling & Blasting, Inc. in Wrentham, MA was subcontracted by Pare to advance probes to a depth of 15 feet or until refusal on bedrock using an air-track drill rig. Pare personnel provided field observation and coordination for the subsurface exploration performed on September 4, 2019. Twenty-six (26) rock probes (i.e. RP19-1 to RP19-26) were advanced across the proposed site using a Fukurawa HCR-9ES air-track drill rig. The





purpose of the probes was to investigate for the presence of boulders and to determine the depth to bedrock across the proposed building and parking area. No samples were taken for this investigation.

Pare's field personnel observed the exploration conditions, visually identified the depths at which boulders, bedrock and groundwater were encountered and logged pertinent information. The rock probe logs are included in Appendix A and rock probe locations are shown on Figure 1: Subsurface Exploration Plan. Rock probe locations were georeferenced using a handheld GPS. Bedrock, boulders and groundwater elevations provided in relation to the ground surface elevation at boring locations are approximate.

FINDINGS

The subsurface material across the proposed site generally consists of surface material composed of fill and/or topsoil with wood, leaves, roots and organics, overlying sand and gravel glacial deposits, overlying bedrock. Boulders are present within the sand and gravel glacial deposits in some areas of the proposed site. Rock probes within which boulders, groundwater and bedrock were encountered are as follows:

- **BOULDERS** were encountered between approximately El. 175.8 and El. 177.8 feet in rock probe RP19-1, between El. 193.7 and El. 196.7 feet in rock probe RP19-16, at El. 211.8 feet, El. 213.8 feet, and El. 216.8 feet in rock probe RP19-19, between El. 204.1 and El. 207.1 feet in rock probe RP19-20, at El. 210.5 feet and El. 214.5 feet in rock probe RP19-23, and between El. 214.9 and El. 216.9 feet in rock probe RP19-24.
- **GROUNDWATER** was encountered in rock probes RP19-6, RP19-8, RP19-10, RP19-13 through RP19-16, RP19-25 and RP19-26.
- **BEDROCK/Possible BEDROCK** was encountered in rock probes RP19-2 through RP19-8, RP19-16 through RP19-20, and RP19-23 through RP19-26.

The ground surface elevation was referenced from a topographic survey. Approximate bedrock, boulders, and groundwater elevations are provided in Table 1: Subsurface Exploration Summary. It should be noted that groundwater levels are known to fluctuate due to local and regional factors including, but not limited to, precipitation events, seasonal changes, and periods of wet or dry weather.

Rubble from a demolished building structure located at 1 East Union Street was observed around the northern corner of the site. Available information suggests that the building structure was demolished between May 2016 and April 2017, however remains of the building structure such as stone masonry still exist at the proposed site. It is likely that rubble in the form of bricks, pipes and metal will be encountered within the fill in the area of the demolished building structure.

CONCLUSIONS

Shallow groundwater conditions are expected to be encountered in the southern, southeastern and southwestern areas of the proposed site near the wetland. The depth to groundwater varied between approximately 3 feet to 8 feet below the ground surface.

Boulder piles are present in the eastern area of the proposed site and boulders within the subsurface were mostly encountered in rock probes located to the west, east and southeast of the proposed site. The elevations at which boulders were encountered varied between approximately El. 177.8 and El. 216.9 feet.

The depth to bedrock varied between approximately 6 feet to greater than 15 feet below the ground surface.



Ms. Amy J. Dunlap

- 3 -

December 03, 2019

Bedrock was found to be at a depth greater than 15 feet below the ground surface in the southern portion of the site.

We trust this report addresses the geotechnical issues for this project. Please contact us at (508) 543-1775 if you have any questions or comments.

Sincerely,

PARE CORPORATION

A blue ink signature of My Linh Pham, written in a cursive style.

My Linh Pham
Engineer I

A blue ink signature of Simon McGrath, written in a cursive style.

Simon McGrath, P.G., P.E.
Managing Engineer

Attachments:

Figures and Tables:

Figure 1: Subsurface Exploration Plan

Table 1: Subsurface Exploration Summary

Appendices:

Appendix A: Probe Logs

Appendix B: Geotechnical Limitations

FIGURE & TABLE

TABLE 1: SUBSURFACE EXPLORATION SUMMARY

Rock Probe ID	General Location		*Ground Surface Elevation (ft)	Approximate Depth from Ground Surface/Elevation (ft)							
				Bedrock		Top of Boulder(s)		Groundwater		Depth of Exploration	
	North (°)	East (°)		Depth	Elevation	Depth	Elevation	Depth	Elevation	Depth	Elevation
RP19-1	2920136.038	669719.805	189.8	NE	NE	12	177.8	NE	NE	15	174.8
RP19-2	2920207.155	669783.388	198.2	14	184.2	NE	NE	NE	NE	15	183.2
RP19-3	2920317.164	669897.627	212.4	7	205.4	NE	NE	NE	NE	15	197.4
RP19-4	2920288.875	669966.625	219.4	8	211.4	NE	NE	NE	NE	15	204.4
RP19-5	2920249.308	670030.383	219.9	6	213.9	NE	NE	NE	NE	15	204.9
RP19-6	2920222.099	670085.778	221.6	9	212.6	NE	NE	6	215.6	15	206.6
RP19-7	2920100.896	670071.042	219.7	13	206.7	NE	NE	NE	NE	15	204.7
RP19-8	2920014.356	670115.414	220.0	15	205.0	NE	NE	8	212.0	15	205.0
RP19-9	2919968.883	670171.847	219.0	NE	NE	NE	NE	NE	NE	15	204.0
RP19-10	2919903.676	670164.508	220.0	NE	NE	NE	NE	3	217.0	15	205.0
RP19-11	2919995.989	670047.507	216.0	NE	NE	NE	NE	NE	NE	15	201.0
RP19-12	2919945.997	670007.375	212.8	NE	NE	NE	NE	NE	NE	15	197.8
RP19-13	2919979.928	669926.536	204.5	NE	NE	NE	NE	6	198.5	15	189.5
RP19-14	2920075.685	669936.08	208.7	NE	NE	NE	NE	6	202.7	15	193.7
RP19-15	2920084.125	669866.131	200.8	NE	NE	NE	NE	6	194.8	15	185.8
RP19-16	2920152.885	669828.453	198.7	11	187.7	2	196.7	6	192.7	15	183.7
RP19-17	2920137.269	669918.446	206.1	8	198.1	NE	NE	NE	NE	15	191.1
RP19-18	2920170.433	669961.064	214.9	12	202.9	NE	NE	NE	NE	15	199.9
RP19-19	2920246.647	669956.337	218.8	14	204.8	2	216.8	NE	NE	15	203.8
						5	213.8				
						7	211.8				
RP19-20	2920207.379	669881.289	209.1	8	201.1	2	207.1	NE	NE	15	194.1
RP19-21	2920041.816	669976.284	212.4	NE	NE	NE	NE	NE	NE	15	197.4
RP19-22	2920019.328	669953.749	208.4	NE	NE	NE	NE	NE	NE	15	193.4
RP19-23	2920111.636	669984.824	215.5	14	201.5	1	214.5	NE	NE	15	200.5
						5	210.5				
RP19-24	2920121.463	670048.808	218.9	9	209.9	2	216.9	NE	NE	15	203.9
RP19-25	2920218.903	670041.408	219.5	12	207.5	NE	NE	6	213.5	15	204.5
RP19-26	2920139.194	670101.278	220.0	13	207.0	NE	NE	6	214.0	15	205.0

NE – Not encountered

*The ground surface elevation was referenced from a topographic survey by Guerriere & Halnon, Inc. of Milford, MA, dated November 01,2019.

**APPENDIX A:
Probe Logs**



Pare Corporation
 10 Lincoln Road, Suite 210
 Foxboro, MA 02035
 T: 508-543-1755
 F: 508-543-1881

GEOPROBE NUMBER RP19-1

CLIENT HKT Architects **PROJECT NAME** Ashland Public Safety Complex
PROJECT NUMBER 17044.03 **PROJECT LOCATION** Ashland, MA
DATE STARTED 9/4/19 **COMPLETED** 9/4/19 **GROUND ELEVATION** 189.8 ft **HOLE SIZE** 2 1/2 inches
DRILLING CONTRACTOR South Street Drilling & Blasting **GROUND WATER LEVELS:**
DRILLING METHOD Air track **AT TIME OF DRILLING** --- Not Encountered
LOGGED BY MLP **CHECKED BY** SJM **AT END OF DRILLING** ---
BORING LOCATION 2920136.038°N, 669719.805°E

GEOPROBE NUMBER - GINT STD US LAB.GDT - 12/3/19 14:27 - Y:JOBS17 JOBS\17044.03 HKT-ASHLAND PS COMPLEX FINAL DES & CA-MAIGEO TECHNICAL BORING AND PROBE LOGS\PROBES\17044.03 PROBE LOGS.GPJ

DEPTH (ft)	SAMPLE TYPE NUMBER	DEPTH (FT)	GRAPHIC LOG	SAMPLE DESCRIPTION	STRATUM DESCRIPTION
0					
0 - 12	P-1			SAND and GRAVEL	SAND & GRAVEL
12 - 14	P-2			Boulders	BOULDERS
14 - 15	P-3			SAND and GRAVEL	SAND & GRAVEL
Bottom of probe at 15.0 feet.					
15					
20					

REMARKS:

- 1. Easy drilling.

BURMISTER CLASSIFICATION

TRACE	0 -10%
LITTLE	10 - 20%
SOME	20 - 35%
AND	35 - 50%
PERCENT BY WEIGHT	

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



Pare Corporation
 10 Lincoln Road, Suite 210
 Foxboro, MA 02035
 T: 508-543-1755
 F: 508-543-1881

GEOPROBE NUMBER RP19-2

CLIENT HKT Architects **PROJECT NAME** Ashland Public Safety Complex
PROJECT NUMBER 17044.03 **PROJECT LOCATION** Ashland, MA
DATE STARTED 9/4/19 **COMPLETED** 9/4/19 **GROUND ELEVATION** 198.2 ft **HOLE SIZE** 2 1/2 inches
DRILLING CONTRACTOR South Street Drilling & Blasting **GROUND WATER LEVELS:**
DRILLING METHOD Air track **AT TIME OF DRILLING** --- Not Encountered
LOGGED BY MLP **CHECKED BY** SJM **AT END OF DRILLING** ---
BORING LOCATION 2920207.155°N, 669783.388°E

GEOPROBE NUMBER - GINT STD US LAB.GDT - 12/3/19 14:27 - Y:JOBS17 JOBS\17044.03 HKT-ASHLAND PS COMPLEX FINAL DES & CA-MAIGEO TECHNICAL BORING AND PROBE LOGS\PROBES\17044.03 PROBE LOGS.GPJ

DEPTH (ft)	SAMPLE TYPE NUMBER	DEPTH (FT)	GRAPHIC LOG	SAMPLE DESCRIPTION	STRATUM DESCRIPTION
0					
	P-1	0 - 14		SAND & GRAVEL	SAND & GRAVEL
	P-2	14 - 15		Bedrock	BEDROCK
Bottom of probe at 15.0 feet.					
20					

REMARKS:

BURMISTER CLASSIFICATION

TRACE	0 -10%
LITTLE	10 - 20%
SOME	20 - 35%
AND	35 - 50%
PERCENT BY WEIGHT	

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



Pare Corporation
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 T: 508-543-1755
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GEOPROBE NUMBER RP19-3

CLIENT HKT Architects **PROJECT NAME** Ashland Public Safety Complex
PROJECT NUMBER 17044.03 **PROJECT LOCATION** Ashland, MA
DATE STARTED 9/4/19 **COMPLETED** 9/4/19 **GROUND ELEVATION** 212.4 ft **HOLE SIZE** 2 1/2 inches
DRILLING CONTRACTOR South Street Drilling & Blasting **GROUND WATER LEVELS:**
DRILLING METHOD Air track **AT TIME OF DRILLING** --- Not Encountered
LOGGED BY MLP **CHECKED BY** SJM **AT END OF DRILLING** ---
BORING LOCATION 2920317.164°N, 669897.627°E

GEOPROBE NUMBER - GINT STD US LAB.GDT - 12/3/19 14:27 - Y:JOBS\17 JOBS\17044.03 HKT-ASHLAND PS COMPLEX FINAL DES & CA-MA\GEO\TECHNICAL\BORING AND PROBE LOGS\PROBES\17044.03 PROBE LOGS.GPJ

DEPTH (ft)	SAMPLE TYPE NUMBER	DEPTH (FT)	GRAPHIC LOG	SAMPLE DESCRIPTION	STRATUM DESCRIPTION
0					
	P-1	0 - 7		SAND and GRAVEL	SAND & GRAVEL
5					
	P-2	7 - 15		Bedrock	BEDROCK
10					
15					
Bottom of probe at 15.0 feet.					
20					

REMARKS:

1. Driller indicated very hard bedrock encountered at 7'.

BURMISTER CLASSIFICATION

TRACE	0 -10%
LITTLE	10 - 20%
SOME	20 - 35%
AND	35 - 50%
PERCENT BY WEIGHT	

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



Pare Corporation
 10 Lincoln Road, Suite 210
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 T: 508-543-1755
 F: 508-543-1881

GEOPROBE NUMBER RP19-4

CLIENT HKT Architects **PROJECT NAME** Ashland Public Safety Complex
PROJECT NUMBER 17044.03 **PROJECT LOCATION** Ashland, MA
DATE STARTED 9/4/19 **COMPLETED** 9/4/19 **GROUND ELEVATION** 219.4 ft **HOLE SIZE** 2 1/2 inches
DRILLING CONTRACTOR South Street Drilling & Blasting **GROUND WATER LEVELS:**
DRILLING METHOD Air track **AT TIME OF DRILLING** --- Not Encountered
LOGGED BY MLP **CHECKED BY** SJM **AT END OF DRILLING** ---
BORING LOCATION 2920288.875°N, 669966.625°E

GEOPROBE NUMBER - GINT STD US LAB.GDT - 12/3/19 14:27 - Y:JOBS17 JOBS\17044.03 HKT-ASHLAND PS COMPLEX FINAL DES & CA-MAIGEO TECHNICAL BORING AND PROBE LOGS\PROBES\17044.03 PROBE LOGS.GPJ

DEPTH (ft)	SAMPLE TYPE NUMBER	DEPTH (FT)	GRAPHIC LOG	SAMPLE DESCRIPTION	STRATUM DESCRIPTION
0					
0 - 8	P-1	0 - 8		SAND and GRAVEL	SAND & GRAVEL
8 - 15	P-2	8 - 15		Bedrock	BEDROCK
Bottom of probe at 15.0 feet.					
15					
20					

REMARKS:

BURMISTER CLASSIFICATION

TRACE	0 -10%
LITTLE	10 - 20%
SOME	20 - 35%
AND	35 - 50%
PERCENT BY WEIGHT	

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



Pare Corporation
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 Foxboro, MA 02035
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 F: 508-543-1881

GEOPROBE NUMBER RP19-5

CLIENT HKT Architects **PROJECT NAME** Ashland Public Safety Complex
PROJECT NUMBER 17044.03 **PROJECT LOCATION** Ashland, MA
DATE STARTED 9/4/19 **COMPLETED** 9/4/19 **GROUND ELEVATION** 219.9 ft **HOLE SIZE** 2 1/2 inches
DRILLING CONTRACTOR South Street Drilling & Blasting **GROUND WATER LEVELS:**
DRILLING METHOD Air track **AT TIME OF DRILLING** --- Not Encountered
LOGGED BY MLP **CHECKED BY** SJM **AT END OF DRILLING** ---
BORING LOCATION 2920249.308°N, 670030.383°E

GEOPROBE NUMBER - GINT STD US LAB.GDT - 12/3/19 14:27 - Y:JOBS17 JOBS\17044.03 HKT-ASHLAND PS COMPLEX FINAL DES & CA-MA/GEO/TECHNICAL/BORING AND PROBE LOGS\PROBES\17044.03 PROBE LOGS.GPJ

DEPTH (ft)	SAMPLE TYPE NUMBER	DEPTH (FT)	GRAPHIC LOG	SAMPLE DESCRIPTION	STRATUM DESCRIPTION
0					
0 - 6	P-1	0 - 6		SAND and GRAVEL	SAND & GRAVEL
6 - 15	P-2	6 - 15		Bedrock	BEDROCK

Bottom of probe at 15.0 feet.

REMARKS:

BURMISTER CLASSIFICATION

TRACE 0 -10%
 LITTLE 10 - 20%
 SOME 20 - 35%
 AND 35 - 50%

PERCENT BY WEIGHT

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



Pare Corporation
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 Foxboro, MA 02035
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 F: 508-543-1881

GEOPROBE NUMBER RP19-6

CLIENT HKT Architects **PROJECT NAME** Ashland Public Safety Complex
PROJECT NUMBER 17044.03 **PROJECT LOCATION** Ashland, MA
DATE STARTED 9/4/19 **COMPLETED** 9/4/19 **GROUND ELEVATION** 221.6 ft **HOLE SIZE** 2 1/2 inches
DRILLING CONTRACTOR South Street Drilling & Blasting **GROUND WATER LEVELS:**
DRILLING METHOD Air track **AT TIME OF DRILLING** 6.00 ft / Elev 215.60 ft (Approximate)
LOGGED BY MLP **CHECKED BY** SJM **AT END OF DRILLING** ---
BORING LOCATION 2920222.099°N, 670085.778°E

GEOPROBE NUMBER - GINT STD US LAB.GDT - 12/3/19 14:27 - Y:\JOBS\17 JOBS\17044.03 HKT-ASHLAND PS COMPLEX FINAL DES & CA-MA\GEO\TECHNICAL\BORING AND PROBE LOGS\PROBES\17044.03 PROBE LOGS.GPJ

DEPTH (ft)	SAMPLE TYPE NUMBER	DEPTH (FT)	GRAPHIC LOG	SAMPLE DESCRIPTION	STRATUM DESCRIPTION
0					
0 - 9	P-1	0 - 9		SAND and GRAVEL	SAND & GRAVEL
9 - 15	P-2	9 - 15		Bedrock	BEDROCK
Bottom of probe at 15.0 feet.					
15					
20					

REMARKS:

BURMISTER CLASSIFICATION

TRACE	0 -10%
LITTLE	10 - 20%
SOME	20 - 35%
AND	35 - 50%
PERCENT BY WEIGHT	

NOTES: 1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES, TRANSITIONS MAY BE GRADUAL.
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Pare Corporation
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 F: 508-543-1881

GEOPROBE NUMBER RP19-7

CLIENT HKT Architects **PROJECT NAME** Ashland Public Safety Complex
PROJECT NUMBER 17044.03 **PROJECT LOCATION** Ashland, MA
DATE STARTED 9/4/19 **COMPLETED** 9/4/19 **GROUND ELEVATION** 219.7 ft **HOLE SIZE** 2 1/2 inches
DRILLING CONTRACTOR South Street Drilling & Blasting **GROUND WATER LEVELS:**
DRILLING METHOD Air track **AT TIME OF DRILLING** --- Not Encountered
LOGGED BY MLP **CHECKED BY** SJM **AT END OF DRILLING** ---
BORING LOCATION 2920100.896°N, 670071.042°E

GEOPROBE NUMBER - GINT STD US LAB.GDT - 12/3/19 14:27 - Y:JOBS17 JOBS\17044.03 HKT-ASHLAND PS COMPLEX FINAL DES & CA-MAIGEO TECHNICAL BORING AND PROBE LOGS\PROBES\17044.03 PROBE LOGS.GPJ

DEPTH (ft)	SAMPLE TYPE NUMBER	DEPTH (FT)	GRAPHIC LOG	SAMPLE DESCRIPTION	STRATUM DESCRIPTION
0					
0 - 13	P-1			SAND and GRAVEL	SAND & GRAVEL
13 - 15	P-2			Bedrock	BEDROCK
Bottom of probe at 15.0 feet.					
20					

REMARKS:

BURMISTER CLASSIFICATION

TRACE	0 -10%
LITTLE	10 - 20%
SOME	20 - 35%
AND	35 - 50%
PERCENT BY WEIGHT	

NOTES: 1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES, TRANSITIONS MAY BE GRADUAL.
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Pare Corporation
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 Foxboro, MA 02035
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 F: 508-543-1881

GEOPROBE NUMBER RP19-8

CLIENT HKT Architects **PROJECT NAME** Ashland Public Safety Complex
PROJECT NUMBER 17044.03 **PROJECT LOCATION** Ashland, MA
DATE STARTED 9/4/19 **COMPLETED** 9/4/19 **GROUND ELEVATION** 220 ft **HOLE SIZE** 2 1/2 inches
DRILLING CONTRACTOR South Street Drilling & Blasting **GROUND WATER LEVELS:**
DRILLING METHOD Air track **AT TIME OF DRILLING** 8.00 ft / Elev 212.00 ft (Approximate)
LOGGED BY MLP **CHECKED BY** SJM **AT END OF DRILLING** ---
BORING LOCATION 2920014.355°N, 670115.414°E

GEOPROBE NUMBER - GINT STD US LAB.GDT - 12/3/19 14:27 - Y:JOBS\17 JOBS\17044.03 HKT-ASHLAND PS COMPLEX FINAL DES & CA-MAIGEO TECHNICAL BORING AND PROBE LOGS\PROBES\17044.03 PROBE LOGS.GPJ

DEPTH (ft)	SAMPLE TYPE NUMBER	DEPTH (FT)	GRAPHIC LOG	SAMPLE DESCRIPTION	STRATUM DESCRIPTION
0	P-1	0 - 15		SAND and GRAVEL	
5					
10					SAND & GRAVEL
15					
Bottom of probe at 15.0 feet.					
20					

REMARKS:

- Driller indicated bedrock was encountered at approximately 15'.

BURMISTER CLASSIFICATION

TRACE	0 -10%
LITTLE	10 - 20%
SOME	20 - 35%
AND	35 - 50%

PERCENT BY WEIGHT

NOTES: 1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES, TRANSITIONS MAY BE GRADUAL.
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Pare Corporation
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 F: 508-543-1881

GEOPROBE NUMBER RP19-9

CLIENT HKT Architects **PROJECT NAME** Ashland Public Safety Complex
PROJECT NUMBER 17044.03 **PROJECT LOCATION** Ashland, MA
DATE STARTED 9/4/19 **COMPLETED** 9/4/19 **GROUND ELEVATION** 219 ft **HOLE SIZE** 2 1/2 inches
DRILLING CONTRACTOR South Street Drilling & Blasting **GROUND WATER LEVELS:**
DRILLING METHOD Air track **AT TIME OF DRILLING** --- Not Encountered
LOGGED BY MLP **CHECKED BY** SJM **AT END OF DRILLING** ---
BORING LOCATION 2919968.883°N, 670171.847°E

GEOPROBE NUMBER - GINT STD US LAB.GDT - 12/3/19 14:27 - Y:JOBS\17 JOBS\17044.03 HKT-ASHLAND PS COMPLEX FINAL DES & CA-MA\GEO\TECHNICAL\BORING AND PROBE LOGS\PROBES\17044.03 PROBE LOGS.GPJ

DEPTH (ft)	SAMPLE TYPE NUMBER	DEPTH (FT)	GRAPHIC LOG	SAMPLE DESCRIPTION	STRATUM DESCRIPTION
0	P-1	0 - 15		SAND and GRAVEL	
5					SAND & GRAVEL
10					
15					
Bottom of probe at 15.0 feet.					
20					

REMARKS:

BURMISTER CLASSIFICATION

TRACE	0 -10%
LITTLE	10 - 20%
SOME	20 - 35%
AND	35 - 50%
PERCENT BY WEIGHT	

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



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GEOPROBE NUMBER RP19-10

CLIENT HKT Architects **PROJECT NAME** Ashland Public Safety Complex
PROJECT NUMBER 17044.03 **PROJECT LOCATION** Ashland, MA
DATE STARTED 9/4/19 **COMPLETED** 9/4/19 **GROUND ELEVATION** 220 ft **HOLE SIZE** 2 1/2 inches
DRILLING CONTRACTOR South Street Drilling & Blasting **GROUND WATER LEVELS:**
DRILLING METHOD Air track **AT TIME OF DRILLING** 3.00 ft / Elev 217.00 ft
LOGGED BY MLP **CHECKED BY** SJM **AT END OF DRILLING** ---
BORING LOCATION 2919903.676°N, 670164.508°E

GEOPROBE NUMBER - GINT STD US LAB.GDT - 12/3/19 14:27 - Y:JOBS\17 JOBS\17044.03 HKT-ASHLAND PS COMPLEX FINAL DES & CA-MA\GEO\TECHNICAL\BORING AND PROBE LOGS\PROBES\17044.03 PROBE LOGS.GPJ

DEPTH (ft)	SAMPLE TYPE NUMBER	DEPTH (FT)	GRAPHIC LOG	SAMPLE DESCRIPTION	STRATUM DESCRIPTION
0	P-1	0 - 15		SAND and GRAVEL	
5					
10					SAND & GRAVEL
15					
Bottom of probe at 15.0 feet.					
20					

REMARKS:

BURMISTER CLASSIFICATION

TRACE	0 -10%
LITTLE	10 - 20%
SOME	20 - 35%
AND	35 - 50%
PERCENT BY WEIGHT	

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



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GEOPROBE NUMBER RP19-11

CLIENT HKT Architects **PROJECT NAME** Ashland Public Safety Complex
PROJECT NUMBER 17044.03 **PROJECT LOCATION** Ashland, MA
DATE STARTED 9/4/19 **COMPLETED** 9/4/19 **GROUND ELEVATION** 216 ft **HOLE SIZE** 2 1/2 inches
DRILLING CONTRACTOR South Street Drilling & Blasting **GROUND WATER LEVELS:**
DRILLING METHOD Air track **AT TIME OF DRILLING** --- Not Encountered
LOGGED BY MLP **CHECKED BY** SJM **AT END OF DRILLING** ---
BORING LOCATION 2919995.959°N, 670047.507°E

GEOPROBE NUMBER - GINT STD US LAB.GDT - 12/3/19 14:27 - Y:JOBS\17 JOBS\17044.03 HKT-ASHLAND PS COMPLEX FINAL DES & CA-MA\GEO\TECHNICAL\BORING AND PROBE LOGS\PROBES\17044.03 PROBE LOGS.GPJ

DEPTH (ft)	SAMPLE TYPE NUMBER	DEPTH (FT)	GRAPHIC LOG	SAMPLE DESCRIPTION	STRATUM DESCRIPTION
0	P-1	0 - 15		SAND & GRAVEL	SAND & GRAVEL
5					
10					
15					
Bottom of probe at 15.0 feet.					
20					

REMARKS:

BURMISTER CLASSIFICATION

TRACE	0 -10%
LITTLE	10 - 20%
SOME	20 - 35%
AND	35 - 50%
PERCENT BY WEIGHT	

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



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GEOPROBE NUMBER RP19-12

CLIENT HKT Architects **PROJECT NAME** Ashland Public Safety Complex
PROJECT NUMBER 17044.03 **PROJECT LOCATION** Ashland, MA
DATE STARTED 9/4/19 **COMPLETED** 9/4/19 **GROUND ELEVATION** 212.8 ft **HOLE SIZE** 2 1/2 inches
DRILLING CONTRACTOR South Street Drilling & Blasting **GROUND WATER LEVELS:**
DRILLING METHOD Air track **AT TIME OF DRILLING** --- Not Encountered
LOGGED BY MLP **CHECKED BY** SJM **AT END OF DRILLING** ---
BORING LOCATION 2919945.997°N, 670007.375°E

GEOPROBE NUMBER - GINT STD US LAB.GDT - 12/3/19 14:27 - Y:JOBS\17 JOBS\17044.03 HKT-ASHLAND PS COMPLEX FINAL DES & CA-MAIGEO TECHNICAL BORING AND PROBE LOGS\PROBES\17044.03 PROBE LOGS.GPJ

DEPTH (ft)	SAMPLE TYPE NUMBER	DEPTH (FT)	GRAPHIC LOG	SAMPLE DESCRIPTION	STRATUM DESCRIPTION
0	P-1	0 - 15		SAND and GRAVEL	
5					
10					SAND & GRAVEL
15					
Bottom of probe at 15.0 feet.					
20					

REMARKS:

BURMISTER CLASSIFICATION

TRACE	0 -10%
LITTLE	10 - 20%
SOME	20 - 35%
AND	35 - 50%
PERCENT BY WEIGHT	

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



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GEOPROBE NUMBER RP19-13

CLIENT HKT Architects
PROJECT NAME Ashland Public Safety Complex
PROJECT NUMBER 17044.03
PROJECT LOCATION Ashland, MA
DATE STARTED 9/4/19 **COMPLETED** 9/4/19
GROUND ELEVATION 204.5 ft **HOLE SIZE** 2 1/2 inches
DRILLING CONTRACTOR South Street Drilling & Blasting
GROUND WATER LEVELS:
DRILLING METHOD Air track **AT TIME OF DRILLING** 6.00 ft / Elev 198.50 ft (Approximate)
LOGGED BY MLP **CHECKED BY** SJM **AT END OF DRILLING** ---
BORING LOCATION 2919979.928°N, 669926.536°E

GEOPROBE NUMBER - GINT STD US LAB.GDT - 12/3/19 14:27 - Y:JOBS\17 JOBS\17044.03 HKT-ASHLAND PS COMPLEX FINAL DES & CA-MAIGEO TECHNICAL BORING AND PROBE LOGS\PROBES\17044.03 PROBE LOGS.GPJ

DEPTH (ft)	SAMPLE TYPE NUMBER	DEPTH (FT)	GRAPHIC LOG	SAMPLE DESCRIPTION	STRATUM DESCRIPTION
0	P-1	0 - 15		SAND and GRAVEL	
5					
10					SAND & GRAVEL
15					
Bottom of probe at 15.0 feet.					
20					

REMARKS:

BURMISTER CLASSIFICATION

TRACE	0 -10%
LITTLE	10 - 20%
SOME	20 - 35%
AND	35 - 50%
PERCENT BY WEIGHT	

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



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GEOPROBE NUMBER RP19-14

CLIENT HKT Architects **PROJECT NAME** Ashland Public Safety Complex
PROJECT NUMBER 17044.03 **PROJECT LOCATION** Ashland, MA
DATE STARTED 9/4/19 **COMPLETED** 9/4/19 **GROUND ELEVATION** 208.7 ft **HOLE SIZE** 2 1/2 inches
DRILLING CONTRACTOR South Street Drilling & Blasting **GROUND WATER LEVELS:**
DRILLING METHOD Air track **AT TIME OF DRILLING** 6.00 ft / Elev 202.70 ft
LOGGED BY MLP **CHECKED BY** SJM **AT END OF DRILLING** ---
BORING LOCATION 2920075.685°N, 669936.080°E

GEOPROBE NUMBER - GINT STD US LAB.GDT - 12/3/19 14:27 - Y:JOBS\17 JOBS\17044.03 HKT-ASHLAND PS COMPLEX FINAL DES & CA-MA\GEO\TECHNICAL\BORING AND PROBE LOGS\PROBES\17044.03 PROBE LOGS.GPJ

DEPTH (ft)	SAMPLE TYPE NUMBER	DEPTH (FT)	GRAPHIC LOG	SAMPLE DESCRIPTION	STRATUM DESCRIPTION
0	P-1	0 - 15		SAND and GRAVEL	
5					
10					SAND & GRAVEL
15					
Bottom of probe at 15.0 feet.					
20					

REMARKS:

BURMISTER CLASSIFICATION

TRACE	0 -10%
LITTLE	10 - 20%
SOME	20 - 35%
AND	35 - 50%
PERCENT BY WEIGHT	

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



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GEOPROBE NUMBER RP19-15

CLIENT HKT Architects
PROJECT NAME Ashland Public Safety Complex
PROJECT NUMBER 17044.03
PROJECT LOCATION Ashland, MA
DATE STARTED 9/4/19 **COMPLETED** 9/4/19
GROUND ELEVATION 200.8 ft **HOLE SIZE** 2 1/2 inches
DRILLING CONTRACTOR South Street Drilling & Blasting
GROUND WATER LEVELS:
 ∇ **AT TIME OF DRILLING** 6.00 ft / Elev 194.80 ft (Approximate)
AT END OF DRILLING ---
DRILLING METHOD Air track
LOGGED BY MLP **CHECKED BY** SJM
BORING LOCATION 2920084.125°N, 669866.131°E

GEOPROBE NUMBER - GINT STD US LAB.GDT - 12/3/19 14:27 - Y:JOBS\17 JOBS\17044.03 HKT-ASHLAND PS COMPLEX FINAL DES & CA-MAIGEO TECHNICAL BORING AND PROBE LOGS\PROBES\17044.03 PROBE LOGS.GPJ

DEPTH (ft)	SAMPLE TYPE NUMBER	DEPTH (FT)	GRAPHIC LOG	SAMPLE DESCRIPTION	STRATUM DESCRIPTION
0	P-1	0 - 15		Moist, gray to brown SAND and GRAVEL	
5					
10					SAND & GRAVEL
15					
Bottom of probe at 15.0 feet.					
20					

REMARKS:

BURMISTER CLASSIFICATION

TRACE	0 -10%
LITTLE	10 - 20%
SOME	20 - 35%
AND	35 - 50%
PERCENT BY WEIGHT	

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



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GEOPROBE NUMBER RP19-16

CLIENT HKT Architects **PROJECT NAME** Ashland Public Safety Complex
PROJECT NUMBER 17044.03 **PROJECT LOCATION** Ashland, MA
DATE STARTED 9/4/19 **COMPLETED** 9/4/19 **GROUND ELEVATION** 198.7 ft **HOLE SIZE** 2 1/2 inches
DRILLING CONTRACTOR South Street Drilling & Blasting **GROUND WATER LEVELS:**
DRILLING METHOD Air track **AT TIME OF DRILLING** 6.00 ft / Elev 192.70 ft (Approximate)
LOGGED BY MLP **CHECKED BY** SJM **AT END OF DRILLING** ---
BORING LOCATION 2920152.885°N, 669828.453°E

GEOPROBE NUMBER - GINT STD US LAB.GDT - 12/3/19 14:27 - Y:JOBS\17 JOBS\17044.03 HKT-ASHLAND PS COMPLEX FINAL DES & CA-MA/GEO/TECHNICAL/BORING AND PROBE LOGS\PROBES\17044.03 PROBE LOGS.GPJ

DEPTH (ft)	SAMPLE TYPE NUMBER	DEPTH (FT)	GRAPHIC LOG	SAMPLE DESCRIPTION	STRATUM DESCRIPTION
0					
	P-1	0 - 2		SAND and GRAVEL	SAND & GRAVEL
	P-2	2 - 5		Boulder	BOULDER
5					
	P-3	5 - 11		SAND and GRAVEL	SAND & GRAVEL
10					
	P-4	11 - 15		Bedrock	BEDROCK
15					
Bottom of probe at 15.0 feet.					
20					

REMARKS:	BURMISTER CLASSIFICATION
	TRACE 0 -10%
	LITTLE 10 - 20%
	SOME 20 - 35%
	AND 35 - 50%
	PERCENT BY WEIGHT

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



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GEOPROBE NUMBER RP19-17

CLIENT HKT Architects **PROJECT NAME** Ashland Public Safety Complex
PROJECT NUMBER 17044.03 **PROJECT LOCATION** Ashland, MA
DATE STARTED 9/4/19 **COMPLETED** 9/4/19 **GROUND ELEVATION** 206.1 ft **HOLE SIZE** 2 1/2 inches
DRILLING CONTRACTOR South Street Drilling & Blasting **GROUND WATER LEVELS:**
DRILLING METHOD Air track **AT TIME OF DRILLING** --- Not Encountered
LOGGED BY MLP **CHECKED BY** SJM **AT END OF DRILLING** ---
BORING LOCATION 2920137.269°N, 669918.446°E

GEOPROBE NUMBER - GINT STD US LAB.GDT - 12/3/19 14:27 - Y:\JOBS\17 JOBS\17044.03 HKT-ASHLAND PS COMPLEX FINAL DES & CA-MA\GEO\TECHNICAL\BORING AND PROBE LOGS\PROBES\17044.03 PROBE LOGS.GPJ

DEPTH (ft)	SAMPLE TYPE NUMBER	DEPTH (FT)	GRAPHIC LOG	SAMPLE DESCRIPTION	STRATUM DESCRIPTION
0					
0 - 8	P-1	0 - 8		SAND and GRAVEL	SAND & GRAVEL
8 - 15	P-2	8 - 15		Bedrock	BEDROCK

Bottom of probe at 15.0 feet.

REMARKS:

1. Driller indicated soft bedrock encountered at 8'.

BURMISTER CLASSIFICATION

TRACE	0 -10%
LITTLE	10 - 20%
SOME	20 - 35%
AND	35 - 50%

PERCENT BY WEIGHT

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



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GEOPROBE NUMBER RP19-18

CLIENT HKT Architects **PROJECT NAME** Ashland Public Safety Complex
PROJECT NUMBER 17044.03 **PROJECT LOCATION** Ashland, MA
DATE STARTED 9/4/19 **COMPLETED** 9/4/19 **GROUND ELEVATION** 214.9 ft **HOLE SIZE** 2 1/2 inches
DRILLING CONTRACTOR South Street Drilling & Blasting **GROUND WATER LEVELS:**
DRILLING METHOD Air track **AT TIME OF DRILLING** --- Not Encountered
LOGGED BY MLP **CHECKED BY** SJM **AT END OF DRILLING** ---
BORING LOCATION 2920170.433°N, 669961.064°E

GEOPROBE NUMBER - GINT STD US LAB.GDT - 12/3/19 14:27 - Y:JOBS\17 JOBS\17044.03 HKT-ASHLAND PS COMPLEX FINAL DES & CA-MA\GEO\TECHNICAL\BORING AND PROBE LOGS\PROBES\17044.03 PROBE LOGS.GPJ

DEPTH (ft)	SAMPLE TYPE NUMBER	DEPTH (FT)	GRAPHIC LOG	SAMPLE DESCRIPTION	STRATUM DESCRIPTION
0					
0 - 12	P-1			SAND and GRAVEL	SAND & GRAVEL
12 - 15	P-2			Bedrock	BEDROCK
Bottom of probe at 15.0 feet.					
15					
20					

REMARKS:	BURMISTER CLASSIFICATION
	TRACE 0 -10%
	LITTLE 10 - 20%
	SOME 20 - 35%
	AND 35 - 50%
	PERCENT BY WEIGHT

NOTES: 1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES, TRANSITIONS MAY BE GRADUAL.
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GEOPROBE NUMBER RP19-19

CLIENT HKT Architects
PROJECT NAME Ashland Public Safety Complex
PROJECT NUMBER 17044.03
PROJECT LOCATION Ashland, MA
DATE STARTED 9/4/19 **COMPLETED** 9/4/19
GROUND ELEVATION 218.8 ft **HOLE SIZE** 2 1/2 inches
DRILLING CONTRACTOR South Street Drilling & Blasting
GROUND WATER LEVELS:
DRILLING METHOD Air track **AT TIME OF DRILLING** --- Not Encountered
LOGGED BY MLP **CHECKED BY** SJM **AT END OF DRILLING** ---
BORING LOCATION 2920246.647°N, 669956.337°E

GEOPROBE NUMBER - GINT STD US LAB.GDT - 12/3/19 14:27 - Y:JOBS17 JOBS\17044.03 HKT-ASHLAND PS COMPLEX FINAL DES & CA-MA/GEO/TECHNICAL/BORING AND PROBE LOGS\PROBES\17044.03 PROBE LOGS.GPJ

DEPTH (ft)	SAMPLE TYPE NUMBER	DEPTH (FT)	GRAPHIC LOG	SAMPLE DESCRIPTION	STRATUM DESCRIPTION
0					
	P-1	0 - 2		SAND and GRAVEL	SAND & GRAVEL
	P-2	2 - 3		Boulder	BOULDER
	P-3	3 - 5		SAND and GRAVEL	SAND & GRAVEL
5	P-4	5 - 6		Boulder	BOULDER
	P-5	6 - 7		SAND and GRAVEL	SAND & GRAVEL
	P-6	7 - 9		Boulder	BOULDER
10	P-7	9 - 14		SAND and GRAVEL	SAND & GRAVEL
15	P-8	14 - 15		Bedrock	BEDROCK

Bottom of probe at 15.0 feet.

REMARKS:

BURMISTER CLASSIFICATION

TRACE	0 -10%
LITTLE	10 - 20%
SOME	20 - 35%
AND	35 - 50%
PERCENT BY WEIGHT	

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



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GEOPROBE NUMBER RP19-20

CLIENT HKT Architects
PROJECT NAME Ashland Public Safety Complex
PROJECT NUMBER 17044.03
PROJECT LOCATION Ashland, MA
DATE STARTED 9/4/19 **COMPLETED** 9/4/19
GROUND ELEVATION 209.1 ft **HOLE SIZE** 2 1/2 inches
DRILLING CONTRACTOR South Street Drilling & Blasting
GROUND WATER LEVELS:
DRILLING METHOD Air track **AT TIME OF DRILLING** --- Not Encountered
LOGGED BY MLP **CHECKED BY** SJM **AT END OF DRILLING** ---
BORING LOCATION 2920207.379°N, 669881.289°E

GEOPROBE NUMBER - GINT STD US LAB.GDT - 12/3/19 14:27 - Y:\JOBS\17 JOBS\17044.03 HKT-ASHLAND PS COMPLEX FINAL DES & CA-MA\GEO\TECHNICAL\BORING AND PROBE LOGS\PROBES\17044.03 PROBE LOGS.GPJ

DEPTH (ft)	SAMPLE TYPE NUMBER	DEPTH (FT)	GRAPHIC LOG	SAMPLE DESCRIPTION	STRATUM DESCRIPTION
0					
	P-1	0 - 2		SAND and GRAVEL	SAND & GRAVEL
	P-2	2 - 5		Boulder	BOULDER
5	P-3	5 - 8		SAND and GRAVEL	SAND & GRAVEL
	P-4	8 - 15		Bedrock	BEDROCK
10					
15					
				Bottom of probe at 15.0 feet.	
20					

REMARKS:

BURMISTER CLASSIFICATION	
TRACE	0 -10%
LITTLE	10 - 20%
SOME	20 - 35%
AND	35 - 50%
PERCENT BY WEIGHT	

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



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GEOPROBE NUMBER RP19-21

CLIENT HKT Architects **PROJECT NAME** Ashland Public Safety Complex
PROJECT NUMBER 17044.03 **PROJECT LOCATION** Ashland, MA
DATE STARTED 9/4/19 **COMPLETED** 9/4/19 **GROUND ELEVATION** 212.4 ft **HOLE SIZE** 2 1/2 inches
DRILLING CONTRACTOR South Street Drilling & Blasting **GROUND WATER LEVELS:**
DRILLING METHOD Air track **AT TIME OF DRILLING** --- Not Encountered
LOGGED BY MLP **CHECKED BY** SJM **AT END OF DRILLING** ---
BORING LOCATION 2920041.816°N, 669976.284°E

GEOPROBE NUMBER - GINT STD US LAB.GDT - 12/3/19 14:27 - Y:JOBS\17 JOBS\17044.03 HKT-ASHLAND PS COMPLEX FINAL DES & CA-MA\GEO\TECHNICAL\BORING AND PROBE LOGS\PROBES\17044.03 PROBE LOGS.GPJ

DEPTH (ft)	SAMPLE TYPE NUMBER	DEPTH (FT)	GRAPHIC LOG	SAMPLE DESCRIPTION	STRATUM DESCRIPTION
0	P-1	0 - 15		SAND and GRAVEL	
5					
10					SAND & GRAVEL
15					
Bottom of probe at 15.0 feet.					
20					

REMARKS:	BURMISTER CLASSIFICATION
	TRACE 0 -10%
	LITTLE 10 - 20%
	SOME 20 - 35%
	AND 35 - 50%
	PERCENT BY WEIGHT

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



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GEOPROBE NUMBER RP19-22

CLIENT HKT Architects
PROJECT NAME Ashland Public Safety Complex
PROJECT NUMBER 17044.03
PROJECT LOCATION Ashland, MA
DATE STARTED 9/4/19 **COMPLETED** 9/4/19
GROUND ELEVATION 208.4 ft **HOLE SIZE** 2 1/2 inches
DRILLING CONTRACTOR South Street Drilling & Blasting
GROUND WATER LEVELS:
DRILLING METHOD Air track **AT TIME OF DRILLING** --- Not Encountered
LOGGED BY MLP **CHECKED BY** SJM **AT END OF DRILLING** ---
BORING LOCATION 2920019.328°N, 669953.749°E

GEOPROBE NUMBER - GINT STD US LAB.GDT - 12/3/19 14:28 - Y:JOBS\17 JOBS\17044.03 HKT-ASHLAND PS COMPLEX FINAL DES & CA-MAIGEO TECHNICAL BORING AND PROBE LOGS\PROBES\17044.03 PROBE LOGS.GPJ

DEPTH (ft)	SAMPLE TYPE NUMBER	DEPTH (FT)	GRAPHIC LOG	SAMPLE DESCRIPTION	STRATUM DESCRIPTION
0	P-1	0 - 15		SAND and GRAVEL	
5					
10					SAND & GRAVEL
15					
Bottom of probe at 15.0 feet.					
20					

REMARKS:	BURMISTER CLASSIFICATION
	TRACE 0 -10%
	LITTLE 10 - 20%
	SOME 20 - 35%
	AND 35 - 50%
	PERCENT BY WEIGHT

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



Pare Corporation
 10 Lincoln Road, Suite 210
 Foxboro, MA 02035
 T: 508-543-1755
 F: 508-543-1881

GEOPROBE NUMBER RP19-23

CLIENT HKT Architects **PROJECT NAME** Ashland Public Safety Complex
PROJECT NUMBER 17044.03 **PROJECT LOCATION** Ashland, MA
DATE STARTED 9/4/19 **COMPLETED** 9/4/19 **GROUND ELEVATION** 215.5 ft **HOLE SIZE** 2 1/2 inches
DRILLING CONTRACTOR South Street Drilling & Blasting **GROUND WATER LEVELS:**
DRILLING METHOD Air track **AT TIME OF DRILLING** --- Not Encountered
LOGGED BY MLP **CHECKED BY** SJM **AT END OF DRILLING** ---
BORING LOCATION 2920111.636°N, 669984.824°E

GEOPROBE NUMBER - GINT STD US LAB.GDT - 12/3/19 14:28 - Y:JOBS17 JOBS\17044.03 HKT-ASHLAND PS COMPLEX FINAL DES & CA-MA/GEO/TECHNICAL/BORING AND PROBE LOGS\PROBES\17044.03 PROBE LOGS.GPJ

DEPTH (ft)	SAMPLE TYPE NUMBER	DEPTH (FT)	GRAPHIC LOG	SAMPLE DESCRIPTION	STRATUM DESCRIPTION
0					
	P-1	0 - 1		SAND and GRAVEL	SAND & GRAVEL
	P-2	1 - 3		Boulder	BOULDER
	P-3	3 - 5		SAND and GRAVEL	SAND & GRAVEL
5	P-4	5 - 7		Boulder	BOULDER
	P-5	7 - 14		SAND and GRAVEL	SAND & GRAVEL
10					
	P-6	14 - 15		Bedrock	BEDROCK
15					
Bottom of probe at 15.0 feet.					
20					

REMARKS:

BURMISTER CLASSIFICATION

TRACE	0 -10%
LITTLE	10 - 20%
SOME	20 - 35%
AND	35 - 50%
PERCENT BY WEIGHT	

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



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GEOPROBE NUMBER RP19-24

CLIENT HKT Architects **PROJECT NAME** Ashland Public Safety Complex
PROJECT NUMBER 17044.03 **PROJECT LOCATION** Ashland, MA
DATE STARTED 9/4/19 **COMPLETED** 9/4/19 **GROUND ELEVATION** 218.9 ft **HOLE SIZE** 2 1/2 inches
DRILLING CONTRACTOR South Street Drilling & Blasting **GROUND WATER LEVELS:**
DRILLING METHOD Air track **AT TIME OF DRILLING** --- Not Encountered
LOGGED BY MLP **CHECKED BY** SJM **AT END OF DRILLING** ---
BORING LOCATION 2920121.463°N, 670048.808°E

GEOPROBE NUMBER - GINT STD US LAB.GDT - 12/3/19 14:28 - Y:\JOBS\17 JOBS\17044.03 HKT-ASHLAND PS COMPLEX FINAL DES & CA-MA\GEO\TECHNICAL\BORING AND PROBE LOGS\PROBES\17044.03 PROBE LOGS.GPJ

DEPTH (ft)	SAMPLE TYPE NUMBER	DEPTH (FT)	GRAPHIC LOG	SAMPLE DESCRIPTION	STRATUM DESCRIPTION
0					
	P-1	0 - 2		SAND and GRAVEL	SAND & GRAVEL
	P-2	2 - 4		Boulder	BOULDER
5	P-3	4 - 9		SAND and GRAVEL	SAND & GRAVEL
10	P-4	9 - 15		Bedrock	BEDROCK
15	Bottom of probe at 15.0 feet.				
20					

REMARKS:

BURMISTER CLASSIFICATION

TRACE	0 -10%
LITTLE	10 - 20%
SOME	20 - 35%
AND	35 - 50%
PERCENT BY WEIGHT	

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



Pare Corporation
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GEOPROBE NUMBER RP19-25

CLIENT HKT Architects **PROJECT NAME** Ashland Public Safety Complex
PROJECT NUMBER 17044.03 **PROJECT LOCATION** Ashland, MA
DATE STARTED 9/4/19 **COMPLETED** 9/4/19 **GROUND ELEVATION** 219.5 ft **HOLE SIZE** 2 1/2 inches
DRILLING CONTRACTOR South Street Drilling & Blasting **GROUND WATER LEVELS:**
DRILLING METHOD Air track **AT TIME OF DRILLING** 6.00 ft / Elev 213.50 ft (Approximate)
LOGGED BY MLP **CHECKED BY** SJM **AT END OF DRILLING** ---
BORING LOCATION 2920218.903°N, 670041.408°E

GEOPROBE NUMBER - GINT STD US LAB.GDT - 12/3/19 14:28 - Y:JOBS\17 JOBS\17044.03 HKT-ASHLAND PS COMPLEX FINAL DES & CA-MAIGEO TECHNICAL BORING AND PROBE LOGS\PROBES\17044.03 PROBE LOGS.GPJ

DEPTH (ft)	SAMPLE TYPE NUMBER	DEPTH (FT)	GRAPHIC LOG	SAMPLE DESCRIPTION	STRATUM DESCRIPTION
0					
0 - 12	P-1			SAND and GRAVEL	SAND & GRAVEL
12 - 15	P-2			Bedrock	BEDROCK
Bottom of probe at 15.0 feet.					
15					
20					

REMARKS:

BURMISTER CLASSIFICATION

TRACE	0 -10%
LITTLE	10 - 20%
SOME	20 - 35%
AND	35 - 50%
PERCENT BY WEIGHT	

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



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GEOPROBE NUMBER RP19-26

CLIENT HKT Architects
PROJECT NAME Ashland Public Safety Complex
PROJECT NUMBER 17044.03
PROJECT LOCATION Ashland, MA
DATE STARTED 9/4/19 **COMPLETED** 9/4/19
GROUND ELEVATION 220 ft **HOLE SIZE** 2 1/2 inches
DRILLING CONTRACTOR South Street Drilling & Blasting
GROUND WATER LEVELS:
DRILLING METHOD Air track **∇ AT TIME OF DRILLING** 6.00 ft / Elev 214.00 ft (Approximate)
LOGGED BY MLP **CHECKED BY** SJM **AT END OF DRILLING** ---
BORING LOCATION 2920139.194°N, 670101.278°E

GEOPROBE NUMBER - GINT STD US LAB.GDT - 12/3/19 14:28 - Y:JOBS17 JOBS\17044.03 HKT-ASHLAND PS COMPLEX FINAL DES & CA-MAIGEO TECHNICAL BORING AND PROBE LOGS\PROBES\17044.03 PROBE LOGS.GPJ

DEPTH (ft)	SAMPLE TYPE NUMBER	DEPTH (FT)	GRAPHIC LOG	SAMPLE DESCRIPTION	STRATUM DESCRIPTION
0					
	P-1	0 - 13		Moist, brown to gray SAND and GRAVEL	SAND & GRAVEL
	P-2	13 - 15		Bedrock	BEDROCK
	Bottom of probe at 15.0 feet.				
20					

REMARKS:

BURMISTER CLASSIFICATION

TRACE	0 -10%
LITTLE	10 - 20%
SOME	20 - 35%
AND	35 - 50%
PERCENT BY WEIGHT	

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

**APPENDIX B:
Geotechnical Limitations**



GEOTECHNICAL LIMITATIONS

Explorations

1. The analyses and recommendations submitted in this report are based in part upon the data obtained from subsurface explorations. The nature and extent of variations between these explorations may not become evident until construction. If variations then appear evident, Pare Corporation (Pare) should be asked to reevaluate the recommendations of this report.
2. The generalized soil profile described in the text is intended to convey trends in the subsurface conditions. The boundaries between strata are approximate and idealized and have been developed by interpretations of widely spaced explorations and samples; actual soil transitions are probably more erratic. For specific information, refer to the probe logs.
3. Water level readings have been made in the explorations at the times and under the conditions stated on the exploration logs. These data have been reviewed and interpretations have been made in the text of this report. However, fluctuations in the level of groundwater may occur due to variations in rainfall, temperature, and other factors occurring since the time the measurements were made.

Review

1. In the event that any changes in the nature or location of the proposed building are planned, the conclusions and recommendations contained in this report shall not be considered valid unless the changes are reviewed, and the conclusions of this report are verified in writing by Pare. Pare should also be provided with the opportunity for a general review of the final design and specifications in order that the earthwork and foundation recommendations may be properly interpreted and implemented in the design and specifications.

Construction

1. Pare should be retained to provide soil engineering services during construction of the excavation and foundation phases of work in order to observe compliance with the design concepts, specifications, and recommendations and to allow design changes in the event that subsurface conditions differ from those indicated prior to the start of construction.

Use of Report

1. This report has been prepared for the exclusive use of HKT Architects for specific application to the proposed public safety complex located between 12 -16 Union Street and 1 East Union Street in Ashland, MA in accordance with generally accepted engineering practices. No other warranty, expressed or implied, is made.
2. This engineering report has been prepared for this project by Pare. This report is for design purposes only and is not necessarily sufficient to prepare an accurate bid. Contractors wishing a copy of this report may secure it with the understanding that its scope is limited to design considerations only.