FUSS & O'NEILL

MEMORANDUM

TO:

FROM: Jhonatan Escobar, P.E.

DATE: February 25, 2026

RE: Subsurface Soil and Groundwater Investigation - Town of Montague Hill Neighborhood Green Infrastructure Master Planning
Reference No. 120.0241314.A10

Attachments: Exploration Location Plan, Boring Logs

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1 Geotechnical Assessment

1.1 General

The purpose of this memorandum is to summarize the subsurface soil and groundwater conditions observed within soil borings performed throughout the Town of Montague Hill neighborhood. The drilling program was conducted to identify soils suitable for infiltration and potential soils that may be restrictive to vertical infiltration. The subsurface study program consisted of advancing soil borings, preparing boring logs and a site exploration plan, and preparation of this memorandum.

1.2 Subsurface Explorations

Eighteen (18) soil borings were advanced between January 20 and 29, 2026 by Bronson Drilling Co. of Winchester, Massachusetts, using a Geoprobe Bobcat Power Probe 9100-SK with direct push technology (DPT) drilling techniques. The soil borings were observed and logged by a Fuss & O'Neill field representative. Four (4) soil boring locations were selected based upon areas with nearby mass wasting slope failures; the remaining fourteen (14) soil boring locations were conducted in a grid-like pattern throughout the project site.

Soil borings were advanced using DPT methods to approximate depths between 28 and 72 feet below the existing ground surface. Sampling was performed at 4-foot continuous intervals using a DT22 dual tube sampler. Dual tube sampling consisted of driving a 2.25-inch outside diameter dual tube sampler 48 inches with a percussion hammer. B-9 encountered refusal at 5 feet and was offset 3 feet northwest to a total depth of 64 feet. Soil borings B-10 and B-19 were not conducted due to accessibility concerns.

Soil samples were placed in labeled bags and taken to our office for further review and classification. Information provided on the boring logs attached to this report includes soil descriptions in accordance with the Modified Burmister field classification system, boring depth, sampling intervals, and groundwater observations. The soil borings were backfilled with soil cuttings and supplemented with additional material as needed.

1.3 Subsurface Conditions

Subsurface conditions consisted of between 2 to 18 inches of topsoil, underlain by granular soils and at some locations by a layer of fine-grained material. Soil layer boundaries on the boring logs represent the approximate location of changed in soil types. In situ, the transition between materials may be gradual. See boring logs attached. **Table 1** below summarizes depth interval and elevation data of soil layers, groundwater and perched groundwater, if encountered.

1.3.1 Granular Soils

Beneath the surficial topsoil, granular soils were encountered at each boring location. The granular soils generally consisted of fine to coarse sand with little to trace amounts of silt, and varying amounts of gravel. At the boring locations generally located at the northern and eastern portions of the site, the granular soils were observed to consists of either mostly silt or sand with significant silt contents at a depth of approximately between 50 and 68 feet, elevations between 255 and 266 feet (NAVD88). The borings generally located within the northern and eastern portions of the site, commonly at higher ground surface elevations, were terminated within the granular soils at a maximum depth explored between 52 and 72 feet, elevations between 251.4 and 269.6 feet (NAVD88).

1.3.2 Fine-Grained Soils

Fine-grained soils were encountered beneath the granular soils at borings B-11 through B-13 and B-15 through B-18 at approximate depths between 17 and 48 feet, elevations between 241.1 and 283 feet (NAVD88). Borings that encountered fine-grained soils beneath the granular soils are generally located at the southern portion of the site which correlates with lower ground surface elevations. The fine-grained soils generally consist of varying amounts of silts and clays with varying amounts of sand.

1.3.3 Groundwater and Perched Groundwater Observations

Groundwater was encountered in ten (10) soil borings (B-6, B-7, and B-11 through B-18) at approximate depths between 15 and 55 feet, elevations between 242.1 and 293 feet (NAVD88). Groundwater was not encountered at the remaining eight (8) soil borings, generally located at the northern and eastern portions of the Site. Perched groundwater was encountered in some of the borings at approximate depths between 4 and 60 feet.

Groundwater level fluctuations can occur due to seasonal variations in the amount of rainfall, runoff, and other factors not evident at the time explorations were performed. Therefore, groundwater levels during construction or at other times in the life of structures may be higher or lower than the levels indicated in the logs. Additionally, water may become temporarily perched above dense or silty/clayey soil layers. The possibility of groundwater level fluctuations should be considered when developing the design and construction plans for the project.

Table 1
Depth Range of Soil Layers, Groundwater, and Perched Groundwater (Elevations)

Soil Boring	Granular Soils	Fine-Grained Soils	Perched Groundwater	Groundwater
B-1	0.3 (317.4) – > 52 (265.7)	NE	NE	NE
B-2	1 (315.4) – > 56 (260.4)	NE	NE	NE
B-3	0.9 (320.4) – > 56 (265.3)	NE	54 (267.3)	NE
B-4	0.9 (320.7) – > 52 (265.3)	NE	NE	NE
B-5	1 (317.3) – > 52 (266.3)	NE	NE	NE
B-6	0.8 (314.0) – > 60 (254.7)	NE	NE	55 (259.7)
B-7	0.6 (318.2) – > 56 (262.8)	NE	4, 8 (314.8, 310.8)	55 (263.8)
B-8	0.8 (323.4) – > 56 (268.2)	NE	NE	NE
B-9	0.2 (325.8) – > 64 (262)	NE	60 (266)	NE
B-11	0.8 (273.2) – 18 (255.9)	18 (255.9) – > 32 (241.9)	15.5 (258.4)	20 (253.9)
B-12	0.8 (299.1) – 38.5 (261.3)	38.5 (261.3) – > 44 (255.8)	19 (280.8)	39 (260.8)
B-13	1.5 (320.8) – 48 (274.3)	48 (274.3) – > 52 (270.3)	46 (276.3)	47.5 (274.8)
B-14	0.5 (321.5) – > 56 (266)	NE	NE	47 (275)
B-15	0.4 (280.8) – 20 (261.2)	20 (261.2) – > 28 (253.2)	NE	15 (266.2)
B-16	1.3 (256.9) – 17.5 (240.6)	17.5 (240.6) – > 44 (214.1)	4 (254.1)	16 (242.1)
B-17	0.8 (295.8) – 33 (263.5)	33 (263.5) – > 44 (252.5)	28 (268.5)	33 (263.5)
B-18	0.4 (320.6) – 38 (283)	38 (283) - > 40 (281)	NE	28 (293)
B-20	0.7 (322.7) – > 72 (251.4)	NE	NE	NE

1. NE – Indicates not encountered at time of exploration
2. Units for Elevations and Depths are in US feet, and elevations are according to datum NAVD88
3. > -- Indicates that the layer extends past the maximum depth explored

GEOTECHNICAL BOREHOLE B-1

FUSS & O'NEILL

PROJECT NUMBER: 120.0241314.A10	**DRILLING COMPANY:** Bronson Drilling	**NORTHING; EASTING:** 3044816.9, 370371.8
PROJECT NAME: Hill Neighborhood	**DRILLER:** Dan Bronson	**DATUM:** MA83F
ADDRESS: Montague, Massachusetts	**DRILLING METHOD:** Direct Push:	**SURFACE ELEVATION:** 317.7
START DATE: 1/29/2026	**LOCATION:** See Plan	**VERTICAL DATUM:** NAVD 88
END DATE: 1/29/2026	**TOTAL DEPTH:** 52 feet	**LOGGED BY:** L. Meiser
		CHECKED BY: J. Escobar

SAMPLER:	**HAMMER:**	**DRILL RIG:** Bobcat	**COMMENTS:**
Type: Dual Tube	**Type: N/A**	Power Probe 9100-SK	None
Length (ft): 4	**Weight (lb): N/A**	**Type:** Geoprobe	**Backfill:** (0-52 ft) Native Material
O.D. (in): 2.25	**Fall (in.): N/A**		

DRILLING ADVANCEMENT:
(0-52 ft.) Direct Push:
Drilling Fluid: (0-52 ft.) None

WATER LEVEL DATA: Not Encountered

Depth ft	Samples No./ Interval (ft)	Rec / Pen. (in)	Stratum Graphic	Visual - Manual Identification & Description	Remarks	Elevation (ft)
	S-1 0 - 4	24/48		Top 4": Dark Brown, Fine to Coarse SAND, some silt, trace organics (roots, leaves), dry (TOPSOIL)		
				Middle 17": Brown, Fine to Medium SAND, trace silt, dry		316
				Bottom 3": Dark brown, Fine to Medium SAND, little silt, trace organics (roots), damp		314
5	S-2 4 - 8	29/48		Brown, Fine to Medium SAND, trace silt, trace organics (roots), dry		312
	S-3 8 - 12	34/48		Brown, Fine to Coarse SAND, trace silt, damp		310
10	S-4 12 - 16	33/48		Brown, Fine to Coarse SAND, trace silt, damp		308
	S-5 16 - 20	31/48		Brown, Fine to Coarse SAND, trace silt, damp		306
15	S-6 20 - 24	30/48		Brown, Fine to Coarse SAND, trace silt, trace fine gravel, damp		304
	S-7 24 - 28	31/48		Brown, Fine to Coarse SAND, trace silt, damp		302
20						300
						298
25						296
						294
						292
						290

Minor Constituent Proportions:	**Soil Density:**	**Soil Consistency:**	**Sample Type:**	**Notes** Soil identifications and field tests based on visual-manual methods per ASTM D2488 and using the modified Burmister System
And: 35-50%	**Very Loose:** 0-4	**Very Soft:** 0-2	**SS:** Split Spoon	
Some: 20-35%	**Loose:** 4-10	**Soft:** 2-4	**ST:** Shelby Tube	**Well Construction:**
Little: 10-20%	**Medium Dense:** 10-30	**Medium Stiff:** 4-8	**GS:** Grab Sample	
Trace: <10%	**Dense:** 30-50	**Stiff:** 8-15	**ET:** Extruded Tube	
	Very Dense: >50	**Very Stiff:** 15-30	**C:** Rock Core	
		Hard: >30		

GEOTECHNICAL BOREHOLE B-1

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Depth ft	Samples No./ Interval (ft)	Rec / Pen. (in)	Stratum Graphic	Visual - Manual Identification & Description	Remarks	Elevation (ft)
30	S-8 28 - 32	33/48		Brown, Fine to Coarse SAND, trace silt, damp		288
	S-9 32 - 36	31/48		Brown, Fine to Medium SAND, trace coarse sand, trace silt, damp		286
35						284
	S-10 36 - 40	33/48		Light Brown, Fine to Coarse SAND, trace silt, damp	Difficult drilling conditions, likely from overburden pressure	282
40	S-11 40 - 44	32/48		Top 16": Light Brown, Fine to Coarse SAND, trace silt, damp		280
				Bottom 16": Brown, Fine to Medium SAND, trace silt, damp		278
	S-12 44 - 48	37/48		Brown, Fine SAND, trace medium to coarse sand, trace silt, damp (rust staining throughout)		276
45						274
	S-13 48 - 52	34/48		Top 18": Light Brown, Fine SAND, trace medium to coarse sand, damp (rust staining at bottom of sample)	Difficult drilling conditions, likely from overburden pressure	272
50				Bottom 16": Brown, Fine to Medium SAND, trace silt, damp (rust staining throughout)		270
						268
				End of Boring Depth at 52 feet.		266
55						264
						262
60						260
						258
						256
65						254
						252
						250
70						248

GEOTECHNICAL BOREHOLE B-2

FUSS & O'NEILL

PROJECT NUMBER: 120.0241314.A10
PROJECT NAME: Hill Neighborhood
ADDRESS: Montague, Massachusetts
START DATE: 1/27/2026
END DATE: 1/27/2026

DRILLING COMPANY: Bronson Drilling
DRILLER: Dan Bronson
DRILLING METHOD: Direct Push:
LOCATION: See Plan
TOTAL DEPTH: 56 feet

NORTHING; EASTING: 3045670.4, 370460.0
DATUM: MA83F
SURFACE ELEVATION: 316.4
VERTICAL DATUM: NAVD 88
LOGGED BY: L. Meiser
CHECKED BY: J. Escobar

SAMPLER:
Type: Dual Tube
Length (ft): 4
O.D. (in): 2.25

HAMMER:
Type: N/A
Weight (lb): N/A
Fall (in.): N/A

DRILL RIG: Bobcat Power Probe 9100-SK
Type: Geoprobe

COMMENTS:
None
Backfill: (0-56 ft) Native Material

DRILLING ADVANCEMENT:
(0-56 ft.) Direct Push:
Drilling Fluid: (0-56 ft.) None

WATER LEVEL DATA: Not Encountered

Depth ft	Samples No./ Interval (ft)	Rec / Pen. (in)	Stratum Graphic	Visual - Manual Identification & Description	Remarks	Elevation (ft)
	S-1 0 - 4	32/48		Top 12": Dark Brown, SILT, some fine sand, trace organics (roots, grass), dry (TOPSOIL)	Approximately 12" of frost	316
				Middle 8": Dark Brown, Fine to Medium SAND, little silt, trace coarse sand, damp		314
				Bottom 12": Brown, Fine to Coarse SAND, trace silt, damp		
5	S-2 4 - 8	19/48		Light Brown, Fine to Coarse SAND, trace silt, damp (crushed rock in sample)		312
						310
	S-3 8 - 12	31/48		Light Brown, Fine to Coarse SAND, trace silt, damp		308
10						306
	S-4 12 - 16	31/48		Light Brown, Fine to Coarse SAND, trace silt, trace fine gravel, damp		304
15						302
	S-5 16 - 20	31/48		Light Brown, Fine to Coarse SAND, trace silt, trace fine gravel, damp		300
						298
20	S-6 20 - 24	32/48		Light Brown, Fine to Coarse SAND, trace silt, trace fine gravel, damp		296
						294
	S-7 24 - 28	30/48		Light Brown, Fine to Coarse SAND, trace silt, trace fine gravel, damp		292
25						290

Minor Constituent Proportions:
And: 35-50%
Some: 20-35%
Little: 10-20%
Trace: <10%

Soil Density:
Very Loose: 0-4
Loose: 4-10
Medium Dense: 10-30
Dense: 30-50
Very Dense: >50

Soil Consistency:
Very Soft: 0-2
Soft: 2-4
Medium Stiff: 4-8
Stiff: 8-15
Very Stiff: 15-30
Hard: >30

Sample Type:
SS: Split Spoon
ST: Shelby Tube
GS: Grab Sample
ET: Extruded Tube
C: Rock Core

Notes Soil identifications and field tests based on visual-manual methods per ASTM D2488 and using the modified Burmister System

Well Construction:

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Depth ft	Samples No./ Interval (ft)	Rec / Pen. (in)	Stratum Graphic	Visual - Manual Identification & Description	Remarks	Elevation (ft)
30	S-8 28 - 32	31/48		Light Brown, Fine to Coarse SAND, trace silt, trace fine gravel, damp		288 286
35	S-9 32 - 36	32/48		Light Brown, Fine to Coarse SAND, trace silt, damp		284 282
	S-10 36 - 40	34/48		Light Brown, Fine to Coarse SAND, trace silt, trace fine gravel, damp (rust staining at bottom of sample)	Difficult drilling conditions, likely from overburden pressure	280 278
40	S-11 40 - 44	33/48		Light Brown, Fine to Medium SAND, trace silt, damp (rust staining throughout bottom 5" of sample)		276 274
45	S-12 44 - 48	35/48		Light Brown, Fine to Medium SAND, trace coarse sand, trace silt, damp (rust staining throughout sample)	Difficult drilling conditions, likely from overburden pressure	272 270
50	S-13 48 - 52	33/48		Light Brown, Fine to Medium SAND, trace coarse sand, trace silt, damp (rust staining throughout sample)		268 266
55	S-14 52 - 56	35/48		Light Brown, Fine SAND, trace medium to coarse sand, trace silt, damp (rust staining throughout sample)		264 262
60				End of Boring Depth at 56 feet.		260 258 256 254
65						252 250
70						248 246

GEOTECHNICAL BOREHOLE B-3

FUSS & O'NEILL

PROJECT NUMBER: 120.0241314.A10
PROJECT NAME: Hill Neighborhood
ADDRESS: Montague, Massachusetts
START DATE: 1/23/2026
END DATE: 1/23/2026

DRILLING COMPANY: Bronson Drilling
DRILLER: Dan Bronson
DRILLING METHOD: Direct Push:
LOCATION: See Plan
TOTAL DEPTH: 56 feet

NORTHING; EASTING: 3045367.6, 371147.0
DATUM: MA83F
SURFACE ELEVATION: 321.3
VERTICAL DATUM: NAVD 88
LOGGED BY: L. Meiser
CHECKED BY: J. Escobar

SAMPLER:
Type: Dual Tube
Length (ft): 4
O.D. (in): 2.25

HAMMER:
Type: N/A
Weight (lb): N/A
Fall (in.): N/A

DRILL RIG: Bobcat Power Probe 9100-SK
Type: Geoprobe

COMMENTS:
None
Backfill: (0-56 ft) Native Material

DRILLING ADVANCEMENT:
(0-56 ft.) Direct Push:
Drilling Fluid: (0-56 ft.) None

WATER LEVEL DATA: Not Encountered

Depth ft	Samples No./ Interval (ft)	Rec / Pen. (in)	Stratum Graphic	Visual - Manual Identification & Description	Remarks	Elevation (ft)
0	S-1 0 - 4	35/48		Top 11": Dark Brown-Black, Fine to Medium SAND, some silt, trace gravel, trace organics (roots), damp (TOPSOIL)	Approximately 11" of frost	320
				Bottom 24": Brown, Fine to Coarse SAND, trace silt, trace gravel, damp		318
5	S-2 4 - 8	31/48		Light Brown, Fine to Medium SAND, trace coarse sad, trace silt, damp		316
						314
	S-3 8 - 12	29/48		Light Brown, Fine to Coarse SAND, trace silt, damp		312
10						310
	S-4 12 - 16	23/48		Light Brown, Fine to Coarse SAND, trace gravel, trace (-) silt, damp		308
15						306
	S-5 16 - 20	23/48		Light Brown, Fine to Coarse SAND, trace gravel, trace (-) silt, damp		304
						302
20	S-6 20 - 24	16/48		Light Brown, Fine to Coarse SAND, trace gravel, trace (-) silt, damp		300
						298
	S-7 24 - 28	26/48		Light Brown, Fine to Coarse SAND, trace gravel, trace (-) silt, damp		296
25						294

Minor Constituent Proportions:
And: 35-50%
Some: 20-35%
Little: 10-20%
Trace: <10%

Soil Density:
Very Loose: 0-4
Loose: 4-10
Medium Dense: 10-30
Dense: 30-50
Very Dense: >50

Soil Consistency:
Very Soft: 0-2
Soft: 2-4
Medium Stiff: 4-8
Stiff: 8-15
Very Stiff: 15-30
Hard: >30

Sample Type:
SS: Split Spoon
ST: Shelby Tube
GS: Grab Sample
ET: Extruded Tube
C: Rock Core

Notes Soil identifications and field tests based on visual-manual methods per ASTM D2488 and using the modified Burmister System

Well Construction:

GEOTECHNICAL BOREHOLE B-3

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Depth ft	Samples No./ Interval (ft)	Rec / Pen. (in)	Stratum Graphic	Visual - Manual Identification & Description	Remarks	Elevation (ft)
30	S-8 28 - 32	25/48		Light Brown, Fine to Coarse SAND, trace gravel, trace (-) silt, damp		292
	S-9 32 - 36	26/48		Light Brown, Fine to Coarse SAND, trace gravel, trace (-) silt, damp		290
35	S-10 36 - 40	29/48		Light Brown, Fine to Coarse SAND, trace gravel, trace (-) silt, damp		288
	S-11 40 - 44	29/48		Light Brown, Fine to Medium SAND, some coarse sand, trace gravel, trace (-) silt, damp (1/4'" rust stain in sample)		286
40	S-12 44 - 48	30/48		Light Brown, Fine to Medium SAND, trace gravel, trace (-) silt, damp		284
	S-13 48 - 52	30/48		Light Brown, Fine to Medium SAND, some coarse sand, trace gravel, trace (-) silt, damp (rust staining throughout)		282
45	S-14 52 - 56	32/48		Top 20": Light Brown, Fine to Coarse SAND, trace gravel, trace (-) silt, damp		280
				Middle 6": Gray-Brown, SILT, moist (6" perched water, significant rust staining)		278
50				Bottom 6": Light Brown, Fine SAND, little silt, damp		276
				End of Boring Depth at 56 feet.		274
55						272
						270
60						268
						266
65						264
						262
70						260
						258
						256
						254
						252

GEOTECHNICAL BOREHOLE B-4

FUSS & O'NEILL

PROJECT NUMBER: 120.0241314.A10
PROJECT NAME: Hill Neighborhood
ADDRESS: Montague, Massachusetts
START DATE: 1/27/2026
END DATE: 1/27/2026

DRILLING COMPANY: Bronson Drilling
DRILLER: Dan Bronson
DRILLING METHOD: Direct Push:
LOCATION: See Plan
TOTAL DEPTH: 52 feet

NORTHING; EASTING: 3045895.4, 372042.6
DATUM: MA83F
SURFACE ELEVATION: 321.6
VERTICAL DATUM: NAVD 88
LOGGED BY: L. Meiser
CHECKED BY: J. Escobar

SAMPLER:
Type: Dual Tube
Length (ft): 4
O.D. (in): 2.25

HAMMER:
Type: N/A
Weight (lb): N/A
Fall (in.): N/A

DRILL RIG: Bobcat Power Probe 9100-SK
Type: Geoprobe

COMMENTS:
None
Backfill: (0-52 ft) Native Material

DRILLING ADVANCEMENT:
(0-52 ft.) Direct Push:
Drilling Fluid: (0-52 ft.) None

WATER LEVEL DATA: Not Encountered

Depth ft	Samples No./ Interval (ft)	Rec / Pen. (in)	Stratum Graphic	Visual - Manual Identification & Description	Remarks	Elevation (ft)
	S-1 0 - 4	36/48		Top 11": Dark Brown, Fine to Medium SAND, some silt, trace coarse sand, trace gravel, trace organics (roots), dry (TOPSOIL)		
				Bottom 25": Light Brown, Fine to Coarse SAND, trace silt, damp		320
	S-2 4 - 8	32/48		Light Brown, Fine to Coarse SAND, trace silt, damp		318
5						316
	S-3 8 - 12	31/48		Light Brown, Fine to Coarse SAND, trace silt, damp		314
10						312
	S-4 12 - 16	30/48		Top 5": Light Brown, Fine to Coarse SAND, trace silt, damp		310
				Bottom 25": Light Brown, Fine to Medium SAND, trace silt, damp		308
15						306
	S-5 16 - 20	31/48		Light Brown, Fine to Medium SAND, little coarse sand, trace (-) silt, damp		304
20						302
	S-6 20 - 24	34/48		Light Brown, Fine to Medium SAND, little coarse sand, trace (-) silt, damp		300
						298
	S-7 24 - 28	35/48		Light Brown, Fine to Medium SAND, little coarse sand, trace (-) silt, damp		296
25						294

Minor Constituent Proportions:
And: 35-50%
Some: 20-35%
Little: 10-20%
Trace: <10%

Soil Density:
Very Loose: 0-4
Loose: 4-10
Medium Dense: 10-30
Dense: 30-50
Very Dense: >50

Soil Consistency:
Very Soft: 0-2
Soft: 2-4
Medium Stiff: 4-8
Stiff: 8-15
Very Stiff: 15-30
Hard: >30

Sample Type:
SS: Split Spoon
ST: Shelby Tube
GS: Grab Sample
ET: Extruded Tube
C: Rock Core

Notes Soil identifications and field tests based on visual-manual methods per ASTM D2488 and using the modified Burmister System

Well Construction:

produced by ESlog.ESdat.net on 25 Feb 2026

GEOTECHNICAL BOREHOLE B-4

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Depth ft	Samples No./ Interval (ft)	Rec / Pen. (in)	Stratum Graphic	Visual - Manual Identification & Description	Remarks	Elevation (ft)
30	S-8 28 - 32	35/48		Light Brown, Fine to Medium SAND, little coarse sand, trace (-) silt, damp		292
	S-9 32 - 36	36/48		Light Brown, Fine to Medium SAND, little coarse sand, trace (-) silt, damp		290
35	S-10 36 - 40	37/48		Light Brown, Fine to Medium SAND, little coarse sand, little to trace silt, damp (perched water and rust staining within 5" silt layer in middle)		288
	S-11 40 - 44	38/48		Light Brown, Fine SAND, some medium sand, trace silt, damp (rust staining throughout)		286
40	S-12 44 - 48	37/48		Light Brown, Fine SAND, some medium sand, trace silt, damp (rust staining throughout)	Difficult drilling conditions, likely from overburden pressure	284
	S-13 48 - 52	37/48		Light Brown, Fine SAND, trace medium to coarse sand, trace silt, damp (rust staining throughout)		282
45						280
						278
50						276
				End of Boring Depth at 52 feet.		274
55						272
						270
60						268
						266
65						264
						262
70						260
						258
						256
						254
						252

GEOTECHNICAL BOREHOLE B-5

FUSS & O'NEILL

PROJECT NUMBER: 120.0241314.A10
PROJECT NAME: Hill Neighborhood
ADDRESS: Montague, Massachusetts
START DATE: 1/27/2026
END DATE: 1/27/2026

DRILLING COMPANY: Bronson Drilling
DRILLER: Dan Bronson
DRILLING METHOD: Direct Push:
LOCATION: See Plan
TOTAL DEPTH: 52 feet

NORTHING; EASTING: 3046237.6, 372566.8
DATUM: MA83F
SURFACE ELEVATION: 318.3
VERTICAL DATUM: NAVD 88
LOGGED BY: L. Meiser
CHECKED BY: J. Escobar

SAMPLER:
Type: Dual Tube
Length (ft): 4
O.D. (in): 2.25

HAMMER:
Type: N/A
Weight (lb): N/A
Fall (in.): N/A

DRILL RIG: Bobcat Power Probe 9100-SK
Type: Geoprobe

COMMENTS:
None
Backfill: (0-52 ft) Native Material

DRILLING ADVANCEMENT:
(0-52 ft.) Direct Push:
Drilling Fluid: (0-52 ft.) None

WATER LEVEL DATA: Not Encountered

Depth ft	Samples No./ Interval (ft)	Rec / Pen. (in)	Stratum Graphic	Visual - Manual Identification & Description	Remarks	Elevation (ft)
	S-1 0 - 4	38/48		Top 12": Brown, Fine to Medium SAND, some silt, trace organics (roots), damp (TOPSOIL)	Approximately 11" of frost	318
				Middle 5": Dark Brown-Black, Fine to Coarse SAND, little silt, damp		
				Bottom 21": Light Brown, Fine to Coarse SAND, trace fine gravel, trace silt, damp		316
5	S-2 4 - 8	34/48		Light Brown, Fine to Coarse SAND, trace silt, damp		314
						312
	S-3 8 - 12	31/48		Top 15": Light Brown, Fine to Coarse SAND, trace silt, damp		310
10				Bottom 16": Light Brown, Fine to Medium SAND, trace silt, damp (2" rust staining in sample)		308
	S-4 12 - 16	27/48		Light Brown, Fine to Medium SAND, trace coarse sand, trace silt, damp		306
15						304
	S-5 16 - 20	34/48		Light Brown, Fine to Medium SAND, trace coarse sand, trace silt, damp (rust staining at top of sample)		302
						300
20	S-6 20 - 24	36/48		Light Brown, Fine to Medium SAND, trace coarse sand, trace silt, damp		298
						296
	S-7 24 - 28	37/48		Light Brown, Fine to Medium SAND, trace silt, damp (rust staining throughout sample)		294
25						292

Minor Constituent Proportions:
And: 35-50%
Some: 20-35%
Little: 10-20%
Trace: <10%

Soil Density:
Very Loose: 0-4
Loose: 4-10
Medium Dense: 10-30
Dense: 30-50
Very Dense: >50

Soil Consistency:
Very Soft: 0-2
Soft: 2-4
Medium Stiff: 4-8
Stiff: 8-15
Very Stiff: 15-30
Hard: >30

Sample Type:
SS: Split Spoon
ST: Shelby Tube
GS: Grab Sample
ET: Extruded Tube
C: Rock Core

Notes Soil identifications and field tests based on visual-manual methods per ASTM D2488 and using the modified Burmister System

Well Construction:

FUSS & O'NEILL

Depth ft	Samples No./ Interval (ft)	Rec / Pen. (in)	Stratum Graphic	Visual - Manual Identification & Description	Remarks	Elevation (ft)
30	S-8 28 - 32	36/48		Top 20": Light Brown, Fine SAND, trace medium to coarse sand, trace silt, damp Bottom 16": Light Brown, Fine to Medium SAND, trace coarse sand, trace silt, damp		290 288
35	S-9 32 - 36	33/48		Light Brown, Fine to Medium SAND, little coarse sand, trace silt, damp (6" rust staining at bottom of sample)		286 284
	S-10 36 - 40	34/48		Top 16": Light Brown, Fine to Coarse SAND, trace (-) silt, damp (rust staining throughout) Bottom 18": Light Brown, Fine to Medium SAND, trace silt, damp	Difficult drilling conditions, likely from overburden pressure	282 280
40	S-11 40 - 44	35/48		Top 20": Light Brown, Fine to Medium SAND, trace silt, damp Middle 5": Light Brown, Fine to Medium SAND, trace silt, damp (rust staining throughout) Bottom 10": Light Brown, Fine to Medium SAND, little silt, damp		278 276
45	S-12 44 - 48	35/48		Light Brown, Fine to Medium SAND, trace coarse sand, trace silt, damp (rust staining through top 7")		274 272
50	S-13 48 - 52	32/48		Light Brown, Fine to Medium SAND, trace coarse sand, trace silt, damp (1/4" silt seams throughout bottom 22")		270 268
55				End of Boring Depth at 52 feet.		266 264
60						262 260 258
65						256 254
70						252 250 248

GEOTECHNICAL BOREHOLE B-6

FUSS & O'NEILL

PROJECT NUMBER: 120.0241314.A10
PROJECT NAME: Hill Neighborhood
ADDRESS: Montague, Massachusetts
START DATE: 1/21/2026
END DATE: 1/21/2026

DRILLING COMPANY: Bronson Drilling
DRILLER: Dan Bronson
DRILLING METHOD: Direct Push:
LOCATION: See Plan
TOTAL DEPTH: 60 feet

NORTHING; EASTING: 3044580.4, 370920.0
DATUM: MA83F
SURFACE ELEVATION: 314.7
VERTICAL DATUM: NAVD 88
LOGGED BY: L. Meiser
CHECKED BY: J. Escobar

SAMPLER:
Type: Dual Tube
Length (ft): 4
O.D. (in): 2.25

HAMMER:
Type: N/A
Weight (lb): N/A
Fall (in.): N/A

DRILL RIG: Bobcat
Power Probe 9100-SK
Type: Geoprobe

COMMENTS:
None
Backfill: (0-60 ft) Native Material

DRILLING ADVANCEMENT:
(0-60 ft.) Direct Push:
Drilling Fluid: (0-60 ft.) None

WATER LEVEL DATA:
2026-01-21 Water Level 55 ft Below Grade

Depth ft	Samples No./ Interval (ft)	Rec / Pen. (in)	Stratum Graphic	Visual - Manual Identification & Description	Remarks	Elevation (ft)
	S-1 0 - 4	37/48		Top 9": Dark Brown, Fine to Medium SAND, some silt, trace coarse sand, dry (TOPSOIL)	Approximately 9" of frost	314
				Bottom 28": Brown, Fine to Medium SAND, trace coarse sand, trace silt, damp		312
5	S-2 4 - 8	21/48		Top 12": Brown, Fine to Medium SAND, trace coarse sand, trace (-) silt, damp (1/2" silt seams)		310
				Bottom 9": Light Brown, Fine to Coarse SAND, trace (-) silt, damp		308
	S-3 8 - 12	21/48		Light Brown, Fine to Coarse SAND, trace (-) silt, damp		306
10						304
	S-4 12 - 16	15/48		Light Brown, Fine to Coarse SAND, trace (-) silt, damp		302
15						300
	S-5 16 - 20	18/48		Light Brown, Fine to Coarse SAND, trace (-) silt, damp		298
						296
20	S-6 20 - 24	11/48		Light Brown, Fine to Coarse SAND, trace (-) silt, damp		294
						292
	S-7 24 - 28	21/48		Light Brown, Fine to Coarse SAND, trace (-) silt, damp		290
25						288

Minor Constituent Proportions:
And: 35-50%
Some: 20-35%
Little: 10-20%
Trace: <10%

Soil Density:
Very Loose: 0-4
Loose: 4-10
Medium Dense: 10-30
Dense: 30-50
Very Dense: >50

Soil Consistency:
Very Soft: 0-2
Soft: 2-4
Medium Stiff: 4-8
Stiff: 8-15
Very Stiff: 15-30
Hard: >30

Sample Type:
SS: Split Spoon
ST: Shelby Tube
GS: Grab Sample
ET: Extruded Tube
C: Rock Core

Notes Soil identifications and field tests based on visual-manual methods per ASTM D2488 and using the modified Burmister System

Well Construction:

GEOTECHNICAL BOREHOLE B-6

FUSS & O'NEILL

Depth ft	Samples No./ Interval (ft)	Rec / Pen. (in)	Stratum Graphic	Visual - Manual Identification & Description	Remarks	Elevation (ft)
30	S-8 28 - 32	19/48		Light Brown, Fine to Coarse SAND, trace (-) silt, damp		286
						284
35	S-9 32 - 36	28/48		Light Brown, Fine to Medium SAND, little coarse sand, trace silt, damp		282
	S-10 36 - 40	35/48		Light Brown, Fine to Medium SAND, trace coarse sand, trace (-) silt, damp (rust staining in bottom 16")		280
						278
40	S-11 40 - 44	32/48		Light Brown, Fine to Medium SAND, little coarse sand, trace silt, damp (rust staining at bottom)	Difficult drilling conditions, likely from overburden pressure	276
						274
						272
45	S-12 44 - 48	30/48		Light Brown, Fine to Medium SAND, little coarse sand, trace (-) silt, damp		270
	S-13 48 - 52	26/48		Brown, Fine to Coarse SAND, trace (-) silt, damp		268
50						266
	S-14 52 - 56	32/48		Brown, Fine to Coarse SAND, trace (-) silt, wet at 55'		264
						262
55						260
	S-15 56 - 60	39/48		Top 32": Brown, Fine to Coarse SAND, trace (-) silt, wet	Difficult drilling conditions, likely from overburden pressure	258
						256
60				Bottom 7": Dark Brown, SILT and Fine to Medium SAND, wet		
				End of Boring Depth at 60 feet.		254
						252
65						250
						248
						246
70						

GEOTECHNICAL BOREHOLE B-7

FUSS & O'NEILL

PROJECT NUMBER: 120.0241314.A10
PROJECT NAME: Hill Neighborhod
ADDRESS: Montague, Massachusetts
START DATE: 1/23/2026
END DATE: 1/23/2026

DRILLING COMPANY: Bronson Drilling
DRILLER: Dan Bronson
DRILLING METHOD: Direct Push:
LOCATION: See Plan
TOTAL DEPTH: 56 feet

NORTHING; EASTING: 3044858.9, 371140.7
DATUM: MA83F
SURFACE ELEVATION: 318.8
VERTICAL DATUM: NAVD 88
LOGGED BY: L. Meiser
CHECKED BY: J. Escobar

SAMPLER:
Type: Dual Tube
Length (ft): 4
O.D. (in): 2.25

HAMMER:
Type: N/A
Weight (lb): N/A
Fall (in.): N/A

DRILL RIG: Bobcat Power Probe 9100-SK
Type: Geoprobe

COMMENTS:
None
Backfill: (0-56 ft) Native Material

DRILLING ADVANCEMENT:
(0-56 ft.) Direct Push:
Drilling Fluid: (0-56 ft.) None

WATER LEVEL DATA:
2026-01-23 Water Level 55 ft Below Grade

Depth ft	Samples No./ Interval (ft)	Rec / Pen. (in)	Stratum Graphic	Visual - Manual Identification & Description	Remarks	Elevation (ft)
	S-1 0 - 4	38/48		Top 7": Dark Brown-Black, Fine to Medium SAND, some silt, trace organics (roots), dry (TOPSOIL)	Approximately 9" of frost	318
				Bottom 31": Brown, Fine to Coarse SAND, trace (-) silt, dry		316
5	S-2 4 - 8	33/48		Brown, Fine to Coarse SAND, trace silt, moist (3" silt seams throughout, perched water at 4')		314
						312
	S-3 8 - 12	30/48		Brown, Fine to Coarse SAND, trace silt, moist (3" silt seam at top, rust staining at top, perched water at 8')		310
10						308
	S-4 12 - 16	27/48		Brown, Fine to Coarse SAND, trace silt, trace gravel, damp		306
15						304
	S-5 16 - 20	29/48		Brown, Fine to Coarse SAND, trace silt, trace gravel, damp		302
						300
20	S-6 20 - 24	28/48		Brown, Fine to Coarse SAND, trace silt, trace gravel, damp		298
						296
	S-7 24 - 28	29/48		Brown, Fine to Coarse SAND, trace silt, trace fine gravel, damp		294
25						292

Minor Constituent Proportions:
And: 35-50%
Some: 20-35%
Little: 10-20%
Trace: <10%

Soil Density:
Very Loose: 0-4
Loose: 4-10
Medium Dense: 10-30
Dense: 30-50
Very Dense: >50

Soil Consistency:
Very Soft: 0-2
Soft: 2-4
Medium Stiff: 4-8
Stiff: 8-15
Very Stiff: 15-30
Hard: >30

Sample Type:
SS: Split Spoon
ST: Shelby Tube
GS: Grab Sample
ET: Extruded Tube
C: Rock Core

Notes Soil identifications and field tests based on visual-manual methods per ASTM D2488 and using the modified Burmister System

Well Construction:

FUSS & O'NEILL

Depth ft	Samples No./ Interval (ft)	Rec / Pen. (in)	Stratum Graphic	Visual - Manual Identification & Description	Remarks	Elevation (ft)
30	S-8 28 - 32	29/48		Brown, Fine to Coarse SAND, trace silt, trace fine gravel, damp		290 288
35	S-9 32 - 36	29/48		Brown, Fine to Coarse SAND, trace (-) silt, damp		286 284
	S-10 36 - 40	30/48		Brown, Fine to Coarse SAND, trace (-) silt, damp		282 280
40	S-11 40 - 44	30/48		Brown, Fine to Coarse SAND, trace (-) silt, trace gravel, damp (rust staining throughout)		278 276
45	S-12 44 - 48	31/48		Brown, Fine to Coarse SAND, trace (-) silt, damp (rust staining at top)	Difficult drilling conditions, likely from overburden pressure	274 272
50	S-13 48 - 52	32/48		Brown, Fine to Medium, little coarse sand, trace silt, damp	Difficult drilling conditions, likely from overburden pressure	270 268
	S-14 52 - 56	31/48		Top 17": Brown, Fine to Coarse SAND, trace silt, damp		266
55				Bottom 14": Brown, SILT, some fine to coarse sand, wet at 55' (significant rust staining within bottom 14")		264
60				End of Boring Depth at 56 feet.		262 260 258 256
65						254 252
70						250

GEOTECHNICAL BOREHOLE B-8

FUSS & O'NEILL

PROJECT NUMBER: 120.0241314.A10
PROJECT NAME: Hill Neighborhood
ADDRESS: Montague, Massachusetts
START DATE: 1/28/2026
END DATE: 1/28/2026

DRILLING COMPANY: Bronson Drilling
DRILLER: Dan Bronson
DRILLING METHOD: Direct Push:
LOCATION: See Plan
TOTAL DEPTH: 56 feet

NORTHING; EASTING: 3045258.7, 372203.2
DATUM: MA83F
SURFACE ELEVATION: 324.2
VERTICAL DATUM: NAVD 88
LOGGED BY: L. Meiser
CHECKED BY: J. Escobar

SAMPLER:
Type: Dual Tube
Length (ft): 4
O.D. (in): 2.25

HAMMER:
Type: N/A
Weight (lb): N/A
Fall (in.): N/A

DRILL RIG: Bobcat Power Probe 9100-SK
Type: Geoprobe

COMMENTS:
None
Backfill: (0-56 ft) Native Material

DRILLING ADVANCEMENT:
(0-56 ft.) Direct Push:
Drilling Fluid: (0-56 ft.) None

WATER LEVEL DATA: Not Encountered

Depth ft	Samples No./ Interval (ft)	Rec / Pen. (in)	Stratum Graphic	Visual - Manual Identification & Description	Remarks	Elevation (ft)
	S-1 0 - 4	33/48		Top 10": Dark brown, Fine SAND, some silt, trace medium to coarse sand, trace organics (roots), damp (TOPSOIL)	Approximately 10" of frost	324
				Bottom 23": Brown, Fine to Coarse SAND, trace silt, damp		322
5	S-2 4 - 8	34/48		Light Brown, Fine to Coarse SAND, trace fine gravel, trace silt, damp		320
						318
	S-3 8 - 12	33/48		Light Brown, Fine to Coarse SAND, trace silt, damp		316
10						314
	S-4 12 - 16	31/48		Light Brown, Fine to Coarse SAND, trace silt, damp		312
15						310
	S-5 16 - 20	29/48		Light Brown, Fine to Coarse SAND, trace silt, damp		308
						306
20	S-6 20 - 24	33/48		Light Brown, Fine to Coarse SAND, trace silt, damp (rust staining throughout)		304
						302
	S-7 24 - 28	35/48		Light Brown, Fine to Medium SAND, trace silt, damp		300
25						298

Minor Constituent Proportions:
And: 35-50%
Some: 20-35%
Little: 10-20%
Trace: <10%

Soil Density:
Very Loose: 0-4
Loose: 4-10
Medium Dense: 10-30
Dense: 30-50
Very Dense: >50

Soil Consistency:
Very Soft: 0-2
Soft: 2-4
Medium Stiff: 4-8
Stiff: 8-15
Very Stiff: 15-30
Hard: >30

Sample Type:
SS: Split Spoon
ST: Shelby Tube
GS: Grab Sample
ET: Extruded Tube
C: Rock Core

Notes Soil identifications and field tests based on visual-manual methods per ASTM D2488 and using the modified Burmister System

Well Construction:

FUSS & O'NEILL

Depth ft	Samples No./ Interval (ft)	Rec / Pen. (in)	Stratum Graphic	Visual - Manual Identification & Description	Remarks	Elevation (ft)
30	S-8 28 - 32	37/48		Light Brown, Fine to Medium SAND, trace silt, damp		296 294
35	S-9 32 - 36	36/48		Light Brown, Fine to Medium SAND, trace silt, damp		292 290
	S-10 36 - 40	34/48		Light Brown, Fine to Medium SAND, trace silt, damp		288 286
40	S-11 40 - 44	38/48		Light Brown, Fine to Medium SAND, trace silt, damp (rust staining throughout)		284 282
45	S-12 44 - 48	38/48		Top 28": Light Brown, Fine to Medium SAND, trace silt, damp (rust staining throughout)		280 278
				Bottom 10": Light Brown, Fine to Coarse SAND, trace silt, damp		
50	S-13 48 - 52	38/48		Light Brown, Fine to Medium SAND, trace silt, damp		276 274
55	S-14 52 - 56	38/48		Light Brown, Fine to Medium SAND, damp		272 270
60				End of Boring Depth at 56 feet.		268 266 264 262
65						260 258
70						256 254

GEOTECHNICAL BOREHOLE B-9

FUSS & O'NEILL

PROJECT NUMBER: 120.0241314.A10	**DRILLING COMPANY:** Bronson Drilling	**NORTHING; EASTING:** 3045914.2, 372790.6
PROJECT NAME: Hill Neighborhood	**DRILLER:** Dan Bronson	**DATUM:** MA83F
ADDRESS: Montague, Massachusetts	**DRILLING METHOD:** Direct Push:	**SURFACE ELEVATION:** 326
START DATE: 1/20/2026	**LOCATION:** See Plan	**VERTICAL DATUM:** NAVD 88
END DATE: 1/20/2026	**TOTAL DEPTH:** 64 feet	**LOGGED BY:** L. Meiser
		CHECKED BY: J. Escobar

SAMPLER:	**HAMMER:**	**DRILL RIG:** Bobcat	**COMMENTS:**
Type: Dual Tube	**Type:** N/A	Power Probe 9100-SK	None
Length (ft): 4	**Weight (lb):** N/A	**Type:** Geoprobe	**Backfill:** (0-64 ft) Native Material
O.D. (in): 2.25	**Fall (in.):** N/A		

DRILLING ADVANCEMENT:
(0-64 ft.) Direct Push:
Drilling Fluid: (0-64 ft.) None

WATER LEVEL DATA: Not Encountered

Depth ft	Samples No./ Interval (ft)	Rec / Pen. (in)	Stratum Graphic	Visual - Manual Identification & Description	Remarks	Elevation (ft)
	S-1 0 - 4	19/48		Top 2": Dark Brown, Fine to Medium SAND, some silt, trace coarse sand, dry (TOPSOIL) Bottom 17": Brown, Fine to Medium SAND, trace (-) silt, trace gravel, little coarse sand, dry		324
5	S-2 4 - 8	16/48		Brown, Fine to Coarse SAND, trace (-) silt, damp	Refusal at 5', boring offset 3' northwest.	322 320
	S-3 8 - 12	27/48		Brown, Fine to Coarse SAND, trace (-) silt, trace gravel, damp		318
10						316
	S-4 12 - 16	21/48		Brown, Fine to Coarse SAND, trace (-) silt, trace gravel, damp		314
15						312
	S-5 16 - 20	26/48		Brown, Fine to Coarse SAND, trace (-) silt, damp		310
						308
20	S-6 20 - 24	27/48		Brown, Fine to Coarse SAND, trace (-) silt, damp		306
						304
	S-7 24 - 28	36/48		Brown, Fine to Medium SAND, trace coarse sand, trace (-) silt, damp		302
25						300

Minor Constituent Proportions:	**Soil Density:**	**Soil Consistency:**	**Sample Type:**	**Notes** Soil identifications and field tests based on visual-manual methods per ASTM D2488 and using the modified Burmister System
And: 35-50%	**Very Loose:** 0-4	**Very Soft:** 0-2	**SS:** Split Spoon	
Some: 20-35%	**Loose:** 4-10	**Soft:** 2-4	**ST:** Shelby Tube	**Well Construction:**
Little: 10-20%	**Medium Dense:** 10-30	**Medium Stiff:** 4-8	**GS:** Grab Sample	
Trace: <10%	**Dense:** 30-50	**Stiff:** 8-15	**ET:** Extruded Tube	
	Very Dense: >50	**Very Stiff:** 15-30	**C:** Rock Core	
		Hard: >30		

FUSS & O'NEILL

Depth ft	Samples No./ Interval (ft)	Rec / Pen. (in)	Stratum Graphic	Visual - Manual Identification & Description	Remarks	Elevation (ft)
30	S-8 28 - 32	37/48		Brown, Fine to Medium SAND, trace coarse sand, trace silt, damp (1/4" silt seam in bottom 10" with rust staining throughout bottom 14")		296
	S-9 32 - 36	34/48		Brown, Fine to Medium SAND, trace coarse sand, trace (-) silt, damp		294
35						292
	S-10 36 - 40	39/48		Brown, Fine to Medium SAND, trace coarse sand, trace silt, damp (1/2" silt seams in middle)		290
						288
40	S-11 40 - 44	37/48		Brown, Fine to Medium SAND, trace coarse sand, trace silt, damp (1/4" silt seams in middle with rust staining throughout sample)		286
						284
	S-12 44 - 48	40/48		Brown, Fine to Medium SAND, trace coarse sand, trace silt, damp (3" silt layer at bottom)		282
45						280
	S-13 48 - 52	40/48		Brown, Fine to Medium SAND, trace coarse sand, trace silt, damp (3" silt layer at top, rust staining in silt layer)		278
50						276
	S-14 52 - 56	44/48		Brown, Fine to Medium SAND, trace coarse sand, trace silt, damp (rust staining throughout)		274
						272
55						270
	S-15 56 - 60	39/48		Red-Brown, Fine to Medium SAND, trace coarse sand, trace silt, damp (rust staining throughout)		268
60	S-16 60 - 64	36/48		Brown, Fine to Medium SAND, some silt, trace coarse sand, moist (perched water at 62')		266
						264
						262
65				End of Boring Depth at 64 feet.		260
						258
70						256

GEOTECHNICAL BOREHOLE B-11

FUSS & O'NEILL

PROJECT NUMBER: 120.0241314.A10	**DRILLING COMPANY:** Bronson Drilling	**NORTHING; EASTING:** 3043189.6, 370976.2
PROJECT NAME: Hill Neighborhood	**DRILLER:** Dan Bronson	**DATUM:** MA83F
ADDRESS: Montague, Massachusetts	**DRILLING METHOD:** Direct Push:	**SURFACE ELEVATION:** 273.9
START DATE: 1/22/2026	**LOCATION:** See Plan	**VERTICAL DATUM:** NAVD 88
END DATE: 1/22/2026	**TOTAL DEPTH:** 32 feet	**LOGGED BY:** L. Meiser
		CHECKED BY: J. Escobar

SAMPLER:	**HAMMER:**	**DRILL RIG:** Bobcat	**COMMENTS:**
Type: Dual Tube	**Type:** N/A	Power Probe 9100-SK	None
Length (ft): 4	**Weight (lb):** N/A	**Type:** Geoprobe	**Backfill:** (0-32 ft) Native Material
O.D. (in): 2.25	**Fall (in.):** N/A		

DRILLING ADVANCEMENT:
(0-32 ft.) Direct Push:
Drilling Fluid: (0-32 ft.) None

WATER LEVEL DATA:
2026-01-21 Water Level 20 ft Below Grade

Depth ft	Samples No./ Interval (ft)	Rec / Pen. (in)	Stratum Graphic	Visual - Manual Identification & Description	Remarks	Elevation (ft)
	S-1 0 - 4	33/48		Top 9": Dark Brown, Fine to Medium SAND, some silt, trace gravel, trace organics (roots), damp (TOPSOIL)		
				Middle 5": Dark Brown, Fine to Coarse SAND, some gravel, little silt, damp		270
				Bottom 19": Brown, Fine to Coarse SAND, trace silt, damp		
	S-2 4 - 8	37/48		Light Brown, Fine to Coarse SAND, trace silt, damp		268
5						266
	S-3 8 - 12	35/48		Brown, Fine to Medium SAND, little to trace silt, damp (1/4'"silt seams throughout)		264
10						262
	S-4 12 - 16	36/48		Brown, Fine to Medium SAND, little to trace silt, damp (1/4" silt seams throughout)		260
						258
15						256
	S-5 16 - 20	43/48		Top 20": Brown, SILT, little fine to medium sand, damp (rust staining throughout)		254
				Bottom 23": Gray, CLAYEY SILT, trace fine sand, damp		
20	S-6 20 - 24	41/48		Gray, SILT and CLAY, trace fine to medium sand, wet at 20' (4" seams of fine to medium sand, interbedded throughout)		252
						250
	S-7 24 - 28	48/48		Gray, SILT and CLAY, trace fine to medium sand, wet		248
25						246
						244

Minor Constituent Proportions:	**Soil Density:**	**Soil Consistency:**	**Sample Type:**	**Notes** Soil identifications and field tests based on visual-manual methods per ASTM D2488 and using the modified Burmister System
And: 35-50%	**Very Loose:** 0-4	**Very Soft:** 0-2	**SS:** Split Spoon	
Some: 20-35%	**Loose:** 4-10	**Soft:** 2-4	**ST:** Shelby Tube	**Well Construction:**
Little: 10-20%	**Medium Dense:** 10-30	**Medium Stiff:** 4-8	**GS:** Grab Sample	
Trace: <10%	**Dense:** 30-50	**Stiff:** 8-15	**ET:** Extruded Tube	
	Very Dense: >50	**Very Stiff:** 15-30	**C:** Rock Core	
		Hard: >30		

FUSS & O'NEILL

Depth ft	Samples No./ Interval (ft)	Rec / Pen. (in)	Stratum Graphic	Visual - Manual Identification & Description	Remarks	Elevation (ft)
30	S-8 28 - 32	48/48		Gray, SILT and CLAY, trace fine to medium sand, wet		242
						240
				End of Boring Depth at 32 feet.		
35						238
						236
						234
40						232
						230
						228
45						226
						224
50						222
						220
						218
55						216
						214
60						212
						210
						208
65						206
						204
70						202

GEOTECHNICAL BOREHOLE B-12

FUSS & O'NEILL

PROJECT NUMBER: 120.0241314.A10	**DRILLING COMPANY:** Bronson Drilling	**NORTHING; EASTING:** 3043584.8, 371283.6
PROJECT NAME: Hill Neighborhood	**DRILLER:** Dan Bronson	**DATUM:** MA83F
ADDRESS: Montague, Massachusetts	**DRILLING METHOD:** Direct Push:	**SURFACE ELEVATION:** 299.8
START DATE: 1/22/2026	**LOCATION:** See Plan	**VERTICAL DATUM:** NAVD 88
END DATE: 1/22/2026	**TOTAL DEPTH:** 44 feet	**LOGGED BY:** L. Meiser
		CHECKED BY: J. Escobar

SAMPLER:	**HAMMER:**	**DRILL RIG:** Bobcat	**COMMENTS:**
Type: Dual Tube	**Type: N/A**	Power Probe 9100-SK	None
Length (ft): 4	**Weight (lb): N/A**	**Type:** Geoprobe	**Backfill:** (0-44 ft) Native Material
O.D. (in): 2.25	**Fall (in.): N/A**		

DRILLING ADVANCEMENT:	**WATER LEVEL DATA:**
(0-44 ft.) Direct Push:	2026-01-22 Water Level 39 ft Below Grade
Drilling Fluid: (0-44 ft.) None	

Depth ft	Samples No./ Interval (ft)	Rec / Pen. (in)	Stratum Graphic	Visual - Manual Identification & Description	Remarks	Elevation (ft)
	S-1 0 - 4	32/48		Top 9": Dark Brown, Fine to Medium SAND, little silt, trace organics (roots, leaves), trace gravel, dry (TOPSOIL)	Approximately 12" of frost	
				Middle 7": Brown, Fine to Medium SAND, trace (-) silt, damp		298
				Bottom 16": Light Brown, Fine to Coarse SAND, trace (-) silt, damp		296
5	S-2 4 - 8	37/48		Light Brown, Fine to Coarse SAND, trace (-) silt, damp		294
	S-3 8 - 12	37/48		Light Brown, Fine to Coarse SAND, trace (-) silt, damp		292
10	S-4 12 - 16	38/48		Light Brown, Fine to Coarse SAND, trace silt, damp (1/2" silt seam in middle)		290
	S-5 16 - 20	38/48		Top 28": Light Brown, Fine to Coarse SAND, trace silt, damp (1" silt seams throughout)		288
15						286
						284
				Bottom 10": Gray-Brown, SILT and CLAY, trace fine sand, moist (perched water at 19')		282
20	S-6 20 - 24	34/48		Top 26": Gray-Brown, SILTY CLAY, trace fine sand, damp (1" seams of sand throughout sample)		280
						278
				Bottom 8": Light Brown, Fine to Medium SAND, trace coarse sand, trace silt, damp (significant rust staining throughout)		276
25	S-7 24 - 28	40/48		Light Brown, Fine to Medium SAND, trace silt, damp (3" clayey silt seams throughout, rust staining throughout)		274
						272

Minor Constituent Proportions:	**Soil Density:**	**Soil Consistency:**	**Sample Type:**	**Notes** Soil identifications and field tests based on visual-manual methods per ASTM D2488 and using the modified Burmister System
And: 35-50%	**Very Loose:** 0-4	**Very Soft:** 0-2	**SS:** Split Spoon	
Some: 20-35%	**Loose:** 4-10	**Soft:** 2-4	**ST:** Shelby Tube	**Well Construction:**
Little: 10-20%	**Medium Dense:** 10-30	**Medium Stiff:** 4-8	**GS:** Grab Sample	
Trace: <10%	**Dense:** 30-50	**Stiff:** 8-15	**ET:** Extruded Tube	
	Very Dense: >50	**Very Stiff:** 15-30	**C:** Rock Core	
		Hard: >30		

GEOTECHNICAL BOREHOLE B-12

FUSS & O'NEILL

Depth ft	Samples No./ Interval (ft)	Rec / Pen. (in)	Stratum Graphic	Visual - Manual Identification & Description	Remarks	Elevation (ft)
30	S-8 28 - 32	38/48		Light Brown, Fine to Medium SAND, trace silt, damp (1" clayey silt seams throughout, rust staining throughout)		270
	S-9 32 - 36	39/48		Light Brown, Fine to Medium SAND, trace silt, damp (1" silt seams throughout, rust staining throughout)		268
35	S-10 36 - 40	36/48		Top 24": Brown, Fine to Medium SAND, trace silt, damp (1" silt seams throughout, rust staining throughout)		266
				Bottom 12": Gray-Brown, SILT and CLAY, little fine sand, wet at 39'		264
40	S-11 40 - 44	44/48		Gray-Brown, CLAYEY SILT, trace fine sand, wet		262
						260
						258
						256
45				End of Boring Depth at 44 feet.		254
						252
50						250
						248
						246
55						244
						242
60						240
						238
						236
65						234
						232
70						230

GEOTECHNICAL BOREHOLE B-13

FUSS & O'NEILL

PROJECT NUMBER: 120.0241314.A10
PROJECT NAME: Hill Neighborhood
ADDRESS: Montague, Massachusetts
START DATE: 1/22/2026
END DATE: 1/22/2026

DRILLING COMPANY: Bronson Drilling
DRILLER: Dan Bronson
DRILLING METHOD: Direct Push:
LOCATION: See Plan
TOTAL DEPTH: 52 feet

NORTHING; EASTING: 3044264.3, 371949.8
DATUM: MA83F
SURFACE ELEVATION: 322.3
VERTICAL DATUM: NAVD 88
LOGGED BY: L. Meiser
CHECKED BY: J. Escobar

SAMPLER:
Type: Dual Tubing
Length (ft): 4
O.D. (in): 2.25

HAMMER:
Type: N/A
Weight (lb): N/A
Fall (in.): N/A

DRILL RIG: Bobcat Power Probe 9100-SK
Type: Geoprobe

COMMENTS:
None
Backfill: (0-52 ft) Native Material

DRILLING ADVANCEMENT:
(0-52 ft.) Direct Push:
Drilling Fluid: (0-52 ft.) None

WATER LEVEL DATA:
2026-01-22 Water Level 47.5 ft Below Grade

Depth ft	Samples No./ Interval (ft)	Rec / Pen. (in)	Stratum Graphic	Visual - Manual Identification & Description	Remarks	Elevation (ft)
	S-1 0 - 4	30/48		Top 18": Dark Brown, Fine to Medium SAND, some silt, trace coarse sand, damp (TOPSOIL)	Approximately 8" of frost	322
				Bottom 12": Dark Brown, Fine to Coarse SAND, little silt, damp		320
5	S-2 4 - 8	31/48		Brown, Fine to Coarse SAND, trace silt, damp		318
						316
	S-3 8 - 12	30/48		Brown, Fine to Coarse SAND, trace silt, damp		314
10						312
	S-4 12 - 16	28/48		Brown, Fine to Coarse SAND, trace silt, damp		310
						308
15	S-5 16 - 20	27/48		Brown, Fine to Coarse SAND, trace silt, damp		306
						304
20	S-6 20 - 24	27/48		Brown, Fine to Coarse SAND, trace silt, damp		302
						300
	S-7 24 - 28	30/48		Brown, Fine to Coarse SAND, trace silt, damp		298
25						296

Minor Constituent Proportions:
And: 35-50%
Some: 20-35%
Little: 10-20%
Trace: <10%

Soil Density:
Very Loose: 0-4
Loose: 4-10
Medium Dense: 10-30
Dense: 30-50
Very Dense: >50

Soil Consistency:
Very Soft: 0-2
Soft: 2-4
Medium Stiff: 4-8
Stiff: 8-15
Very Stiff: 15-30
Hard: >30

Sample Type:
SS: Split Spoon
ST: Shelby Tube
GS: Grab Sample
ET: Extruded Tube
C: Rock Core

Notes Soil identifications and field tests based on visual-manual methods per ASTM D2488 and using the modified Burmister System

Well Construction:

GEOTECHNICAL BOREHOLE B-13

FUSS & O'NEILL

Depth ft	Samples No./ Interval (ft)	Rec / Pen. (in)	Stratum Graphic	Visual - Manual Identification & Description	Remarks	Elevation (ft)
30	S-8 28 - 32	31/48		Brown, Fine to Coarse SAND, trace silt, damp		294 292
35	S-9 32 - 36	31/48		Brown, Fine to Coarse SAND, trace silt, damp		290 288
	S-10 36 - 40	33/48		Brown, Fine to Coarse SAND, trace silt, damp		286 284
40	S-11 40 - 44	33/48		Brown, Fine to Coarse SAND, trace silt, damp (4'"silt seam in middle)		282 280
45	S-12 44 - 48	32/48		Top 14": Brown, Fine to Coarse SAND, trace (-) silt, damp		278
				Bottom 18": Brown-gray, SILT, little fine to medium sand, wet at 47.5' (4" sand seams throughout, rust staining throughout, perched water throughout)		276
50	S-13 48 - 52	42/48		Dark Brown, CLAYEY SILT, little fine to medium sand, wet		274 272
55				End of Boring Depth at 52 feet.		270 268
60						266 264 262
65						260 258 256
70						254 252

GEOTECHNICAL BOREHOLE B-14

FUSS & O'NEILL

PROJECT NUMBER: 120.0241314.A10	**DRILLING COMPANY:** Bronson Drilling	**NORTHING; EASTING:** 3044631.8, 372812.0
PROJECT NAME: Hill Neighborhood	**DRILLER:** Dan Bronson	**DATUM:** MA83F
ADDRESS: Montague, Massachusetts	**DRILLING METHOD:** Direct Push:	**SURFACE ELEVATION:** 322
START DATE: 1/22/2026	**LOCATION:** See Plan	**VERTICAL DATUM:** NAVD 88
END DATE: 1/22/2026	**TOTAL DEPTH:** 56 feet	**LOGGED BY:** L. Meiser
		CHECKED BY: J. Escobar

SAMPLER:	**HAMMER:**	**DRILL RIG:** Bobcat	**COMMENTS:**
Type: Dual Tubing	**Type:** N/A	Power Probe 9100-SK	None
Length (ft): 4	**Weight (lb):** N/A	**Type:** Geoprobe	**Backfill:** (0-56 ft) Native Material
O.D. (in): 2.25	**Fall (in.):** N/A		

DRILLING ADVANCEMENT:
(0-56 ft.) Direct Push:
Drilling Fluid: (0-56 ft.) None

WATER LEVEL DATA:
2026-01-22 Water Level 47 ft Below Grade

Depth ft	Samples No./ Interval (ft)	Rec / Pen. (in)	Stratum Graphic	Visual - Manual Identification & Description	Remarks	Elevation (ft)
	S-1 0 - 4	31/48		Top 6": Dark Brown-Black, Fine to Coarse SAND, some silt, trace gravel, trace organics (roots), damp (TOPSOIL)	Approximately 6" of frost	
				Middle 16": Brown, Fine to Coarse SAND, trace silt, trace gravel, damp		320
				Bottom 9": Light brown, Fine to Coarse SAND, trace (-) silt, damp		
	S-2 4 - 8	32/48		Light Brown, Fine to Coarse SAND, trace (-) silt, trace fine gravel, damp		318
5						316
	S-3 8 - 12	33/48		Light Brown, Fine to Coarse SAND, trace (-) silt, trace fine gravel, damp		314
10						312
	S-4 12 - 16	29/48		Light Brown, Fine to Coarse SAND, trace (-) silt, damp		310
						308
15						
	S-5 16 - 20	29/48		Light Brown, Fine to Coarse SAND, trace (-) silt, damp (1/4" rust staining in the middle)		306
						304
20						302
	S-6 20 - 24	30/48		Light Brown, Fine to Coarse SAND, trace (-) silt, trace fine gravel, damp (1/4" rust staining in middle)		300
						298
	S-7 24 - 28	31/48		Light Brown, Fine to Coarse SAND, trace (-) silt, damp		
25						296
						294

Minor Constituent Proportions:	**Soil Density:**	**Soil Consistency:**	**Sample Type:**	**Notes** Soil identifications and field tests based on visual-manual methods per ASTM D2488 and using the modified Burmister System
And: 35-50%	**Very Loose:** 0-4	**Very Soft:** 0-2	**SS:** Split Spoon	
Some: 20-35%	**Loose:** 4-10	**Soft:** 2-4	**ST:** Shelby Tube	**Well Construction:**
Little: 10-20%	**Medium Dense:** 10-30	**Medium Stiff:** 4-8	**GS:** Grab Sample	
Trace: <10%	**Dense:** 30-50	**Stiff:** 8-15	**ET:** Extruded Tube	
	Very Dense: >50	**Very Stiff:** 15-30	**C:** Rock Core	
		Hard: >30		

GEOTECHNICAL BOREHOLE B-14

FUSS & O'NEILL

Depth ft	Samples No./ Interval (ft)	Rec / Pen. (in)	Stratum Graphic	Visual - Manual Identification & Description	Remarks	Elevation (ft)
30	S-8 28 - 32	29/48		Light Brown, Fine to Coarse SAND, trace (-) silt, trace fine gravel, damp		292
	S-9 32 - 36	27/48		Light Brown, Fine to Coarse SAND, trace (-) silt, damp		290
35						288
	S-10 36 - 40	37/48		Light Brown, Fine to Coarse SAND, trace (-) silt, damp	Difficult drilling conditions, likely from overburden pressure	286
						284
40	S-11 40 - 44	38/48		Top 23": Light Brown, Fine to Coarse SAND, trace (-) silt, damp	Difficult drilling conditions, likely from overburden pressure	282
				Bottom 15": Light Brown, Fine to Medium SAND, trace silt, damp		280
	S-12 44 - 48	35/48		Top 3": Light Brown, Fine to Coarse SAND, trace silt, damp		278
45				Bottom 32": Light Brown, Fine to Medium SAND, some silt, wet at 47'		276
	S-13 48 - 52	37/48		Brown-Gray, SILT, trace fine sand, wet (1" clay lens at bottom)		274
50						272
	S-14 52 - 56	42/48		Top 36": Brown, Fine to Coarse SAND, trace silt, wet		270
						268
55				Bottom 6": Brown-Gray, SILT, trace fine sand, wet		266
				End of Boring Depth at 56 feet.		264
60						262
						260
65						258
						256
						254
70						252

GEOTECHNICAL BOREHOLE B-15

FUSS & O'NEILL

PROJECT NUMBER: 120.0241314.A10
PROJECT NAME: Hill Neighborhood
ADDRESS: Montague, Massachusetts
START DATE: 1/21/2026
END DATE: 1/21/2026

DRILLING COMPANY: Bronson Drilling
DRILLER: Dan Bronson
DRILLING METHOD: Direct Push:
LOCATION: See Plan
TOTAL DEPTH: 28 feet

NORTHING; EASTING: 3042535.1, 372181.5
DATUM: MA83F
SURFACE ELEVATION: 281.2
VERTICAL DATUM: NAVD 88
LOGGED BY: L. Meiser
CHECKED BY: J. Escobar

SAMPLER:
Type: Dual Tube
Length (ft): 4
O.D. (in): 2.25

HAMMER:
Type: N/A
Weight (lb): N/A
Fall (in.): N/A

DRILL RIG: Bobcat Power Probe 9100-SK
Type: Geoprobe

COMMENTS:
None
Backfill: (0-28 ft) Native Material

DRILLING ADVANCEMENT:
(0-28 ft.) Direct Push:
Drilling Fluid: (0-28 ft.) None

WATER LEVEL DATA:
2026-01-21 Water Level 15 ft Below Grade

Depth ft	Samples No./ Interval (ft)	Rec / Pen. (in)	Stratum Graphic	Visual - Manual Identification & Description	Remarks	Elevation (ft)
	S-1 0 - 4	26/48		Top 5": Dark Brown, Fine to Medium SAND, some silt, trace coarse sand, trace organics (roots), dry (TOPSOIL)	Approximately 7" of frost	
				Bottom 21": Brown, Fine to Coarse SAND, trace silt, dry (1" silt seam in middle)		280
						278
5	S-2 4 - 8	24/48		Brown, Fine to Coarse SAND, trace silt, damp		276
						274
	S-3 8 - 12	35/48		Brown, Fine to Coarse SAND, trace silt, damp		272
10						270
	S-4 12 - 16	40/48		Brown, Fine to Coarse SAND, trace silt, wet at 15'	Difficult drilling from 12' to 16'	268
15						266
	S-5 16 - 20	46/48		Brown, Fine to Coarse SAND, trace (-) silt, wet (1" silt seam in middle)		264
						262
20	S-6 20 - 24	47/48		Top 30": Dark Brown, SILT and CLAY, some fine to coarse sand, wet		260
				Bottom 17": Brown, Fine to Coarse SAND, trace silt, wet (1/2" silt seam in middle)		258
	S-7 24 - 28	27/48		Top 14": Brown, Fine to Coarse SAND, trace silt, wet (3/4" silt seam in middle)		256
25				Bottom 13": Brown, CLAYEY SILT, some fine to medium sand, wet		254
				End of Boring Depth at 28 feet.		252

Minor Constituent Proportions:
And: 35-50%
Some: 20-35%
Little: 10-20%
Trace: <10%

Soil Density:
Very Loose: 0-4
Loose: 4-10
Medium Dense: 10-30
Dense: 30-50
Very Dense: >50

Soil Consistency:
Very Soft: 0-2
Soft: 2-4
Medium Stiff: 4-8
Stiff: 8-15
Very Stiff: 15-30
Hard: >30

Sample Type:
SS: Split Spoon
ST: Shelby Tube
GS: Grab Sample
ET: Extruded Tube
C: Rock Core

Notes Soil identifications and field tests based on visual-manual methods per ASTM D2488 and using the modified Burmister System

Well Construction:

GEOTECHNICAL BOREHOLE B-16

FUSS & O'NEILL

PROJECT NUMBER: 120.0241314.A10	**DRILLING COMPANY:** Bronson Drilling	**NORTHING; EASTING:** 3042385.6, 370761.5
PROJECT NAME: Montague	**DRILLER:** Dan Bronson	**DATUM:** MA83F
ADDRESS: Montague, Massachusetts	**DRILLING METHOD:** Direct Push:	**SURFACE ELEVATION:** 258.1
START DATE: 1/20/2026	**LOCATION:** See Plan	**VERTICAL DATUM:** NAVD 88
END DATE: 1/20/2026	**TOTAL DEPTH:** 44 feet	**LOGGED BY:** L. Meiser
		CHECKED BY: J. Escobar

SAMPLER:	**HAMMER:**	**DRILL RIG:** Bobcat	**COMMENTS:**
Type: Dual Tube	**Type:** N/A	Power Probe 9100-SK	None
Length (ft): 4	**Weight (lb):** N/A	**Type:** Geoprobe	**Backfill:** (0-44 ft) Native Material
O.D. (in): 2.25	**Fall (in.):** N/A		

DRILLING ADVANCEMENT:
(0-44 ft.) Direct Push:
Drilling Fluid: (0-44 ft.) None

WATER LEVEL DATA:
2026-01-20 Water Level 16 ft Below Grade

Depth ft	Samples No./ Interval (ft)	Rec / Pen. (in)	Stratum Graphic	Visual - Manual Identification & Description	Remarks	Elevation (ft)
	S-1 0 - 4	39/48		Top 15": Dark Brown-Brown, Fine to Medium SAND, little silt, trace coarse sand, dry (TOPSOIL)	Approximately 9" frost layer	258
				Middle 9": Dark Brown, Fine to Medium SAND, little silt, dry		256
				Bottom 15": Brown, Fine to Medium SAND, trace (-) silt, trace coarse sand, dry		
5	S-2 4 - 8	31/48		Brown, Fine to Coarse SAND, little silt, trace coarse sand, damp (perched water at 4.5')		254 252
10	S-3 8 - 12	34/48		Light Brown, Fine to Coarse SAND, trace (-) silt, damp		250 248
	S-4 12 - 16	32/48		Brown, Fine to Coarse SAND, little silt, damp (rust staining throughout)		246 244
15	S-5 16 - 20	44/48		Top 13": Brown, Fine to Medium SAND, trace coarse sand, trace silt, wet at 16' (rust staining throughout)		242
				Bottom 31": Brown-Gray, CLAY and SILT, wet		240
20	S-6 20 - 24	48/48		Gray, CLAY and SILT, trace fine sand, wet		238 236
25	S-7 24 - 28	42/48		Top 30": Gray, CLAY and SILT, some fine sand, wet		234 232
				Bottom 12": Brown, Fine to Medium SAND, little silt, trace coarse sand, wet		

Minor Constituent Proportions:	**Soil Density:**	**Soil Consistency:**	**Sample Type:**	**Notes** Soil identifications and field tests based on visual-manual methods per ASTM D2488 and using the modified Burmister System
And: 35-50%	**Very Loose:** 0-4	**Very Soft:** 0-2	**SS:** Split Spoon	**Well Construction:**
Some: 20-35%	**Loose:** 4-10	**Soft:** 2-4	**ST:** Shelby Tube	
Little: 10-20%	**Medium Dense:** 10-30	**Medium Stiff:** 4-8	**GS:** Grab Sample	
Trace: <10%	**Dense:** 30-50	**Stiff:** 8-15	**ET:** Extruded Tube	
	Very Dense: >50	**Very Stiff:** 15-30	**C:** Rock Core	
		Hard: >30		

GEOTECHNICAL BOREHOLE B-16

FUSS & O'NEILL

Depth ft	Samples No./ Interval (ft)	Rec / Pen. (in)	Stratum Graphic	Visual - Manual Identification & Description	Remarks	Elevation (ft)
30	S-8 28 - 32	48/48		Gray, CLAY and SILT, some fine to medium sand, wet (3" sand seam at top of sample)		230 228
35	S-9 32 - 36	48/48		Gray, SILTY CLAY, trace (-) fine sand, wet		226 224
	S-10 36 - 40	48/48		Top 36": Gray, CLAYEY SILT, trace (-) fine sand, wet		222 220
40				Bottom 12": Brown, Fine to Medium SAND, little silt, trace coarse sand, wet (rust staining throughout)		218
	S-11 40 - 44	48/48		Gray, CLAYEY SILT, trace fine to medium sand, wet		216
45				End of Boring Depth at 44 feet.		214 212
50						210 208
55						206 204
60						202 200
65						198 196
70						194 192 190 188

GEOTECHNICAL BOREHOLE B-17

FUSS & O'NEILL

PROJECT NUMBER: 120.0241314.A10	**DRILLING COMPANY:** Bronson Drilling	**NORTHING; EASTING:** 3043132.9, 371815.1
PROJECT NAME: Hill Neighborhood	**DRILLER:** Dan Bronson	**DATUM:** MA83F
ADDRESS: Montague, Massachusetts	**DRILLING METHOD:** Direct Push:	**SURFACE ELEVATION:** 296.5
START DATE: 1/28/2026	**LOCATION:** See Plan	**VERTICAL DATUM:** NAVD 88
END DATE: 1/28/2026	**TOTAL DEPTH:** 44 feet	**LOGGED BY:** L. Meiser
		CHECKED BY: J. Escobar

SAMPLER:	**HAMMER:**	**DRILL RIG:** Bobcat	**COMMENTS:**
Type: Dual Tube	**Type:** N/A	Power Probe 9100-SK	None
Length (ft): 4	**Weight (lb):** N/A	**Type:** Geoprobe	**Backfill:** (0-44 ft) Native Material
O.D. (in): 2.25	**Fall (in.):** N/A		

DRILLING ADVANCEMENT:
(0-44 ft.) Direct Push:
Drilling Fluid: (0-44 ft.) None

WATER LEVEL DATA:
2026-01-28 Water Level 33 ft Below Grade

Depth ft	Samples No./ Interval (ft)	Rec / Pen. (in)	Stratum Graphic	Visual - Manual Identification & Description	Remarks	Elevation (ft)
0	S-1 0 - 4	33/48		Top 9": Dark Brown, Fine SAND, some silt, trace medium to coarse sand, trace organics (grass, roots), dry (TOPSOIL)	Approximately 6" frost layer	296
				Middle 7": Dark Brown, Fine to Medium SAND, little silt, damp		
				Bottom 17": Brown, Fine to Medium SAND, trace coarse sand, trace (-) silt, trace organics (roots), damp		294
5	S-2 4 - 8	32/48		Light Brown, Fine to Medium SAND, trace coarse sand, trace silt, damp		292
						290
	S-3 8 - 12	34/48		Brown, Fine to Medium SAND, little silt, damp (rust staining throughout)		288
10						286
	S-4 12 - 16	36/48		Light Brown, Fine to Coarse SAND, little silt, damp		284
15						282
	S-5 16 - 20	34/48		Light Brown, Fine to Coarse SAND, trace silt, damp		280
						278
20	S-6 20 - 24	33/48		Light Brown, Fine to Coarse SAND, trace silt, damp		276
						274
	S-7 24 - 28	36/48		Brown, Fine to Coarse SAND, little silt, damp (1/4" silt seams in bottom 16")		272
25						270

Minor Constituent Proportions:	**Soil Density:**	**Soil Consistency:**	**Sample Type:**	**Notes** Soil identifications and field tests based on visual-manual methods per ASTM D2488 and using the modified Burmister System
And: 35-50%	**Very Loose:** 0-4	**Very Soft:** 0-2	**SS:** Split Spoon	
Some: 20-35%	**Loose:** 4-10	**Soft:** 2-4	**ST:** Shelby Tube	**Well Construction:**
Little: 10-20%	**Medium Dense:** 10-30	**Medium Stiff:** 4-8	**GS:** Grab Sample	
Trace: <10%	**Dense:** 30-50	**Stiff:** 8-15	**ET:** Extruded Tube	
	Very Dense: >50	**Very Stiff:** 15-30	**C:** Rock Core	
		Hard: >30		

GEOTECHNICAL BOREHOLE B-17

FUSS & O'NEILL

Depth ft	Samples No./ Interval (ft)	Rec / Pen. (in)	Stratum Graphic	Visual - Manual Identification & Description	Remarks	Elevation (ft)
30	S-8 28 - 32	32/48		Brown, Fine to Coarse SAND, trace silt, moist (1/4" silt seams in upper 7", 2" perched water at 28')		268
	S-9 32 - 36	40/48		Top 13": Light Brown, Fine to Medium SAND, trace silt, wet at 33' (1/2" silt seams throughout)		266
35				Bottom 27": Brown, SILT and CLAY, trace fine sand, wet		264
	S-10 36 - 40	35/48		Top 22": Brown, CLAYEY SILT, trace fine sand, wet		262
				Bottom 13": Brown, SILT, some fine sand, wet (significant rust staining)		260
40	S-11 40 - 44	31/48		Brown, SILT, some fine sand, wet		258
						256
						254
45				End of Boring Depth at 44 feet.		252
						250
						248
50						246
						244
						242
55						240
						238
						236
60						234
						232
65						230
						228
70						226

GEOTECHNICAL BOREHOLE B-18

FUSS & O'NEILL

PROJECT NUMBER: 120.0241314.A10	**DRILLING COMPANY:** Bronson Drilling	**NORTHING; EASTING:** 3043852.4, 372900.4
PROJECT NAME: Hill Neighborhood	**DRILLER:** Dan Bronson	**DATUM:** MA83F
ADDRESS: Montague, Massachusetts	**DRILLING METHOD:** Direct Push:	**SURFACE ELEVATION:** 321
START DATE: 1/28/2026	**LOCATION:** See Plan	**VERTICAL DATUM:** NAVD 88
END DATE: 1/28/2026	**TOTAL DEPTH:** 40 feet	**LOGGED BY:** L. Meiser
		CHECKED BY: J. Escobar

SAMPLER:	**HAMMER:**	**DRILL RIG:** Bobcat	**COMMENTS:**
Type: Dual Tube	**Type:** N/A	Power Probe 9100-SK	None
Length (ft): 4	**Weight (lb):** N/A	**Type:** Geoprobe	**Backfill:** (0-40 ft) Native Material
O.D. (in): 2.25	**Fall (in.):** N/A		

DRILLING ADVANCEMENT:
(0-40 ft.) Direct Push:
Drilling Fluid: (0-40 ft.) None

WATER LEVEL DATA:
2026-01-28 Water Level 28 ft Below Grade

Depth ft	Samples No./ Interval (ft)	Rec / Pen. (in)	Stratum Graphic	Visual - Manual Identification & Description	Remarks	Elevation (ft)
	S-1 0 - 4	30/48		Top 5": Brown, Fine to Medium SAND, little silt, trace organics (grass), dry (TOPSOIL)	Approximately 9" frost layer	320
				Bottom 25": Brown, Fine to Coarse SAND, trace (-) silt, trace organics (roots), damp		318
5	S-2 4 - 8	31/48		Light Brown, Fine to Coarse SAND, trace (-) silt, trace fine gravel, damp		316
						314
	S-3 8 - 12	36/48		Light Brown, Fine to Medium SAND, trace coarse sand, trace (-) silt, damp		312
10						310
	S-4 12 - 16	35/48		Light Brown, Fine to Medium SAND, trace silt, damp (1/4" silt seams throughout)		308
15						306
	S-5 16 - 20	38/48		Light Brown, Fine to Medium SAND, trace silt, damp (1/4" silt seams throughout bottom 11")		304
						302
20	S-6 20 - 24	39/48		Top 19": Light Brown, Fine SAND, little silt, damp		300
				Bottom 20": Light Brown, SILT, some fine sand, damp		298
	S-7 24 - 28	40/48		Top 18": Light Brown, SILT, some fine sand, damp		296
25				Bottom 22": Light Brown, Fine SAND and SILT, damp (significant rust staining in sample)		294

Minor Constituent Proportions:	**Soil Density:**	**Soil Consistency:**	**Sample Type:**	**Notes** Soil identifications and field tests based on visual-manual methods per ASTM D2488 and using the modified Burmister System
And: 35-50%	**Very Loose:** 0-4	**Very Soft:** 0-2	**SS:** Split Spoon	
Some: 20-35%	**Loose:** 4-10	**Soft:** 2-4	**ST:** Shelby Tube	**Well Construction:**
Little: 10-20%	**Medium Dense:** 10-30	**Medium Stiff:** 4-8	**GS:** Grab Sample	
Trace: <10%	**Dense:** 30-50	**Stiff:** 8-15	**ET:** Extruded Tube	
	Very Dense: >50	**Very Stiff:** 15-30	**C:** Rock Core	
		Hard: >30		

GEOTECHNICAL BOREHOLE B-18

FUSS & O'NEILL

Depth ft)	Samples No./ Interval (ft)	Rec / Pen. (in)	Stratum Graphic	Visual - Manual Identification & Description	Remarks	Elevation (ft)
30	S-8 28 - 32	26/48		Brown, SILT, trace fine sand, wet at 28' (rust staining throughout)		292 290
35	S-9 32 - 36	27/48		Brown, SILT, trace fine sand, wet		288 286
	S-10 36 - 40	47/48		Top 24": Brown, SILT, trace fine sand, wet		284
40				Bottom 23": Brown, SILT and CLAY, wet End of Boring Depth at 40 feet.		282 280
45						278 276
50						274 272
55						270 268
60						266 264
65						262 260
70						258 256 254 252

GEOTECHNICAL BOREHOLE B-20

FUSS & O'NEILL

PROJECT NUMBER: 120.0241314.A10
PROJECT NAME: Hill Neighborhood
ADDRESS: Montague, Massachusetts
START DATE: 1/29/2026
END DATE: 1/29/2026

DRILLING COMPANY: Bronson Drilling
DRILLER: Dan Bronson
DRILLING METHOD: Direct Push:
LOCATION: See Plan
TOTAL DEPTH: 72 feet

NORTHING; EASTING: 3043178.6, 374484.2
DATUM: MA83F
SURFACE ELEVATION: 323.4
VERTICAL DATUM: NAVD 88
LOGGED BY: L. Meiser
CHECKED BY: J. Esocbar

SAMPLER:
Type: Dual Tube
Length (ft): 4
O.D. (in): 2.25

HAMMER:
Type: N/A
Weight (lb): N/A
Fall (in.): N/A

DRILL RIG: Bobcat
Power Probe 9100-SK
Type: Geoprobe

COMMENTS:
None
Backfill: (0-72 ft) Native Material

DRILLING ADVANCEMENT:
(0-72 ft.) Direct Push:
Drilling Fluid: (0-72 ft.) None

WATER LEVEL DATA: Not Encountered

Depth ft	Samples No./ Interval (ft)	Rec / Pen. (in)	Visual - Manual Identification & Description	Remarks	Elevation (ft)
0	S-1 0 - 4	28/48	Top 8": Dark Brown, Fine to Medium SAND, some silt, trace organics (leaves, roots) (TOPSOIL)		323
			Bottom 20": Brown, Fine to Medium SAND, trace coarse sand, trace silt, damp		322
5	S-2 4 - 8	33/48	Brown, Fine to Coarse SAND, trace silt, damp		320
	S-3 8 - 12	32/48	Brown, Fine to Coarse SAND, trace silt, damp		318
10	S-4 12 - 16	33/48	Light Brown, Fine to Coarse SAND, trace gravel, trace silt, damp		316
	S-5 16 - 20	31/48	Light Brown, Fine to Coarse SAND, trace gravel, trace silt, damp		314
15	S-6 20 - 24	28/48	Light Brown, Fine to Coarse SAND, trace gravel, trace silt, damp		312
	S-7 24 - 28	30/48	Light Brown, Fine to Coarse SAND, trace silt, damp		310
20	S-8 28 - 32	30/48	Light Brown, Fine to Coarse SAND, trace gravel, damp		308
					306
25					304
					302
30					300
					298
					296
					294
					292

Minor Constituent Proportions:
And: 35-50%
Some: 20-35%
Little: 10-20%
Trace: <10%

Soil Density:
Very Loose: 0-4
Loose: 4-10
Medium Dense: 10-30
Dense: 30-50
Very Dense: >50

Soil Consistency:
Very Soft: 0-2
Soft: 2-4
Medium Stiff: 4-8
Stiff: 8-15
Very Stiff: 15-30
Hard: >30

Sample Type:
SS: Split Spoon
ST: Shelby Tube
GS: Grab Sample
ET: Extruded Tube
C: Rock Core

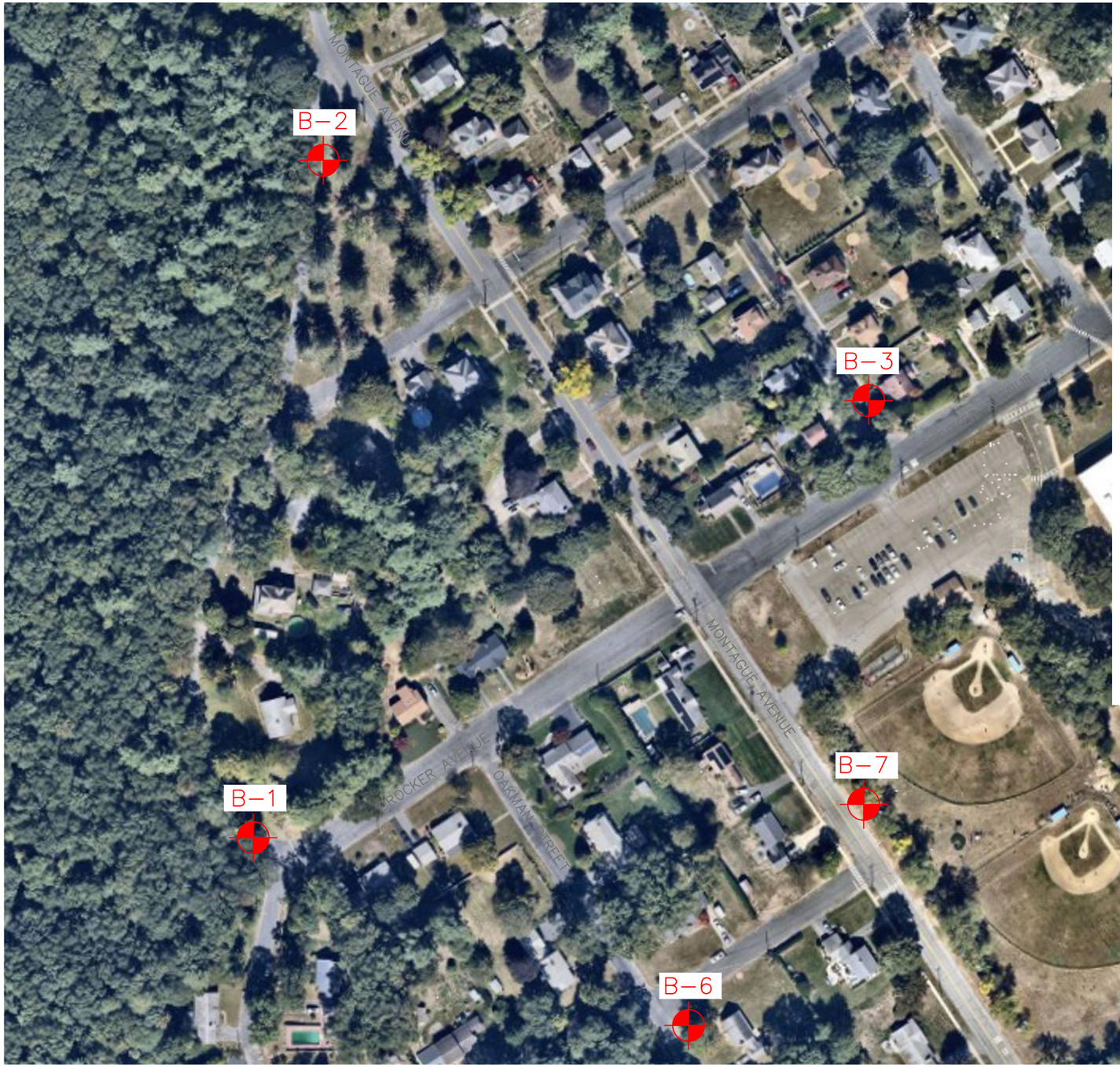
Notes Soil identifications and field tests based on visual-manual methods per ASTM D2488 and using the modified Burmister System

Well Construction:

produced by ESlog.ESdat.net on 25 Feb 2026

FUSS & O'NEILL

Depth ft	Samples No./ Interval (ft)	Rec / Pen. (in)	Stratum Graphic	Visual - Manual Identification & Description	Remarks	Elevation (ft)
	S-9 32 - 36	30/48		Light Brown, Fine to Coarse SAND, trace silt, damp (1/2" rust staining in middle)		290
35						288
	S-10 36 - 40	32/48		Light Brown, Fine to Coarse SAND, trace silt, damp (1/4" rust staining in middle)		286
						284
40	S-11 40 - 44	34/48		Light Brown, Fine to Coarse SAND, trace silt, damp (1/4" rust stains throughout)		282
						280
	S-12 44 - 48	30/48		Light Brown, Fine to Medium SAND, trace coarse sand, trace silt, damp	Difficult drilling conditions, likely from overburden pressure	278
45						276
	S-13 48 - 52	35/48		Light Brown, Fine to Medium SAND, trace coarse sand, trace silt, damp	Difficult drilling conditions, likely from overburden pressure	274
50						272
	S-14 52 - 56	35/48		Light Brown, Fine to Medium SAND, trace coarse sand, trace silt, damp (rust staining in bottom 8" of sample)		270
55						268
	S-15 56 - 60	35/48		Brown, Fine to Medium SAND, trace coarse sand, trace silt, moist (perched water at 59.5')		266
						264
60	S-16 60 - 64	36/48		Brown, Fine to Medium SAND, trace coarse sand, trace silt, damp		262
						260
	S-17 64 - 68	38/48		Brown, Fine SAND, trace silt, damp (1/4" silt seams throughout)		258
65						256
	S-18 68 - 72	40/48		Brown, SILT, some fine sand, damp		254
70						252
				End of Boring Depth at 72 feet.		250
75						248
						246
						244
80						



TEST BORINGS (FEET)			
BORING ID	NORTHING	EASTING	ELEVATION
B-1	3044817.0	370371.8	317.7
B-2	3045670.0	370460.0	316.4
B-3	3045367.6	371147.0	321.3
B-4	3045895.0	372042.6	321.6
B-5	3046237.6	372566.8	318.3
B-6	3044580.4	370920.0	314.7
B-7	3044858.9	371140.7	318.8
B-8	3045258.7	372203.2	324.2
B-9	3045914.2	372790.6	326.0
B-11	3043189.6	370976.2	273.9
B-12	3043584.8	371283.6	299.8
B-13	3044264.3	371949.8	322.3
B-14	3044631.8	372812.0	322.0
B-15	3042535.1	372181.5	381.2
B-16	3042385.6	370761.5	258.1
B-17	3043132.9	371815.1	296.5
B-18	3043852.4	372900.4	321.0
B-20	3043178.6	374484.2	323.4

NOTES:

1. THE HORIZONTAL DATUM IS NAD83 MASSACHUSETTS STATE PLANE (US SURVEY FOOT) AND THE VERTICAL DATUM IS NAVD 1988.
2. LOCATIONS AND SITE FEATURES ARE APPROXIMATE AND GIVEN FOR ILLUSTRATIVE PURPOSES.
3. SOIL BORINGS WERE PERFORMED BY BRONSON DRILLING, CO. OF WINCHESTER MASSACHUSETTS, AND OBSERVED BY FUSS & O'NEILL BETWEEN JANUARY 20 TO JANUARY 29, 2026.

REFERENCES:

1. AERIAL IMAGE WAS TAKEN FROM NEARMAP, DATED SEPTEMBER, 2025.

LEGEND

B-X — SOIL BORINGS

N

APPROXIMATE SCALE:	
HORZ.:	1" = 150'
VERT.:	-
DATUM:	
HORZ.:	MA83F
VERT.:	NAVD88

0 75' 150'

APPROXIMATE SCALE

FUSS & O'NEILL
1550 MAIN STREET, SUITE 400
SPRINGFIELD, MA 01103
413.452.0445
www.fando.com

TOWN OF MONTAGUE

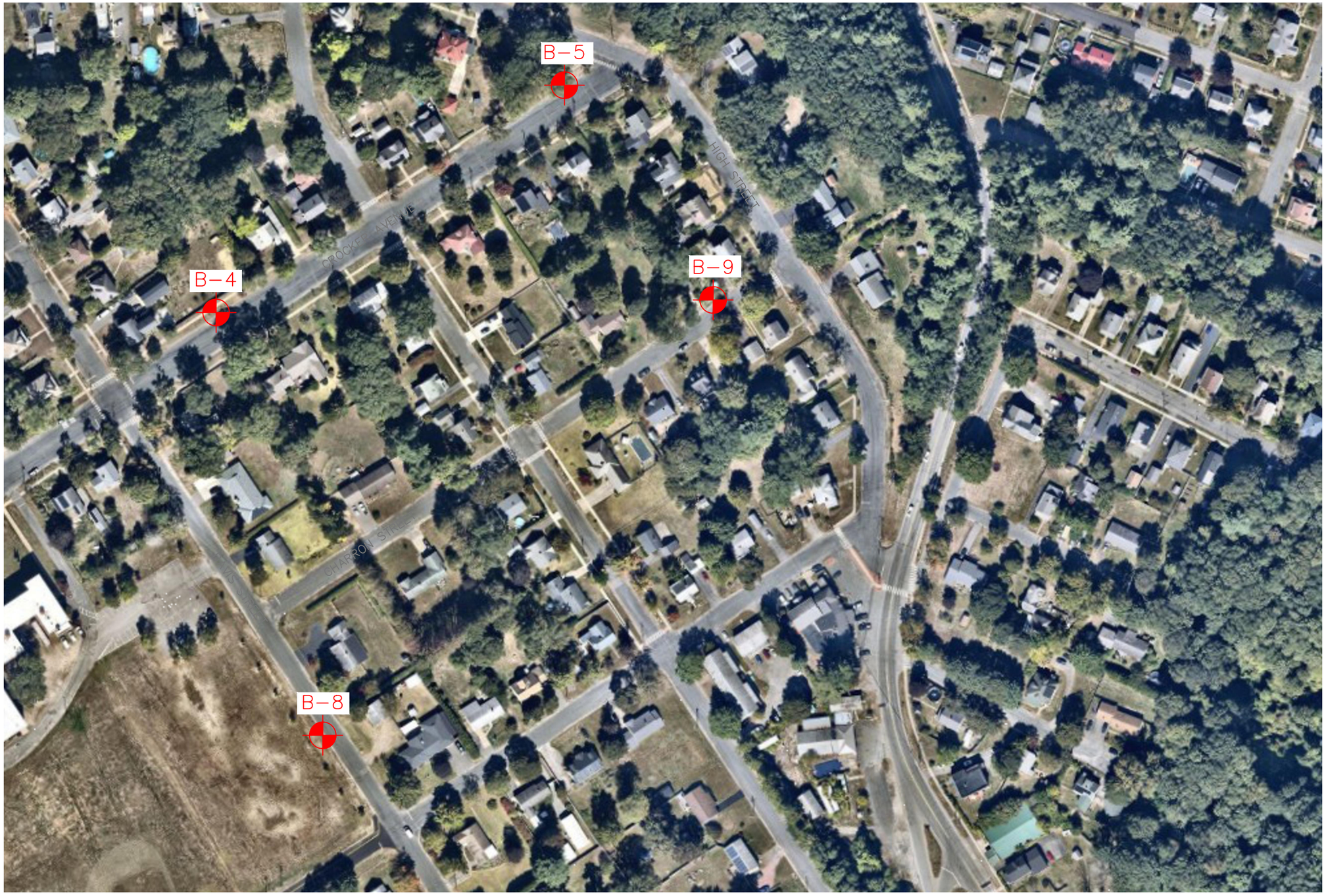
SUBSURFACE EXPLORATION PLAN

HILL NEIGHBORHOOD GREEN INFRASTRUCTURE MASTER PLAN

TURNERS FALL, MONTAGUE — MASSACHUSETTS

PROJ. No.: 120.0241314.A10
DATE: FEB 2026

FIG. 2A



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LEGEND

B-X

SOIL BORINGS

APPROXIMATE SCALE:
HORZ.: 1" = 150'
VERT.: -
DATUM:
HORZ.: MA83F
VERT.: NAVD88
0 75' 150'
APPROXIMATE SCALE

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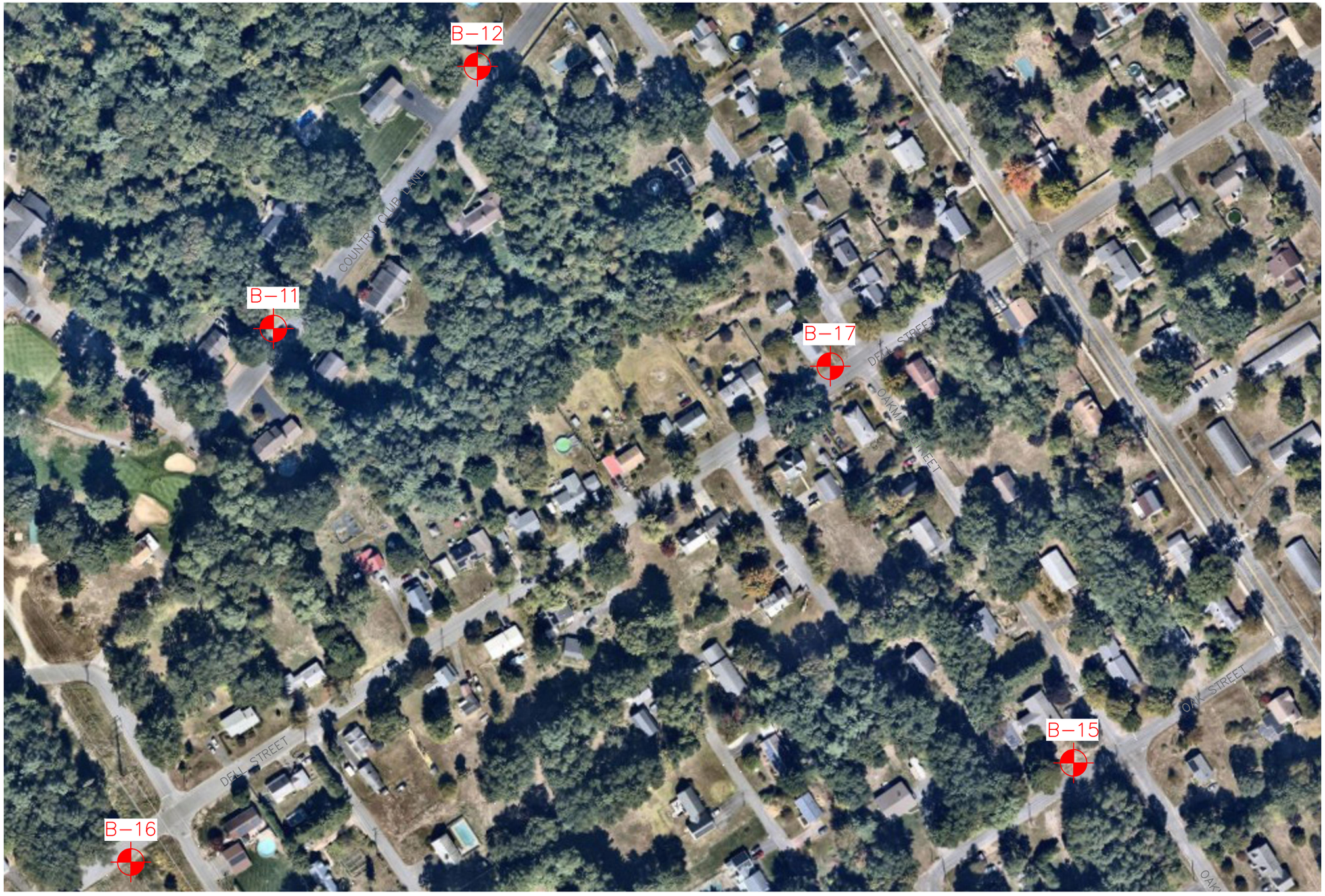
FIG. 2B



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LEGEND

B-X — SOIL BORINGS

N

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PC3: AUTOCAD PDF (GENERAL DOCUMENTATION).PC3 STB/CTB: FO.STB
LAYER STATE:
MS VIEW:

APPROXIMATE SCALE:
HORZ.: 1" = 150'
VERT.: -
DATUM:
HORZ.: MA83F
VERT.: NAVD88
0 75' 150'
APPROXIMATE SCALE

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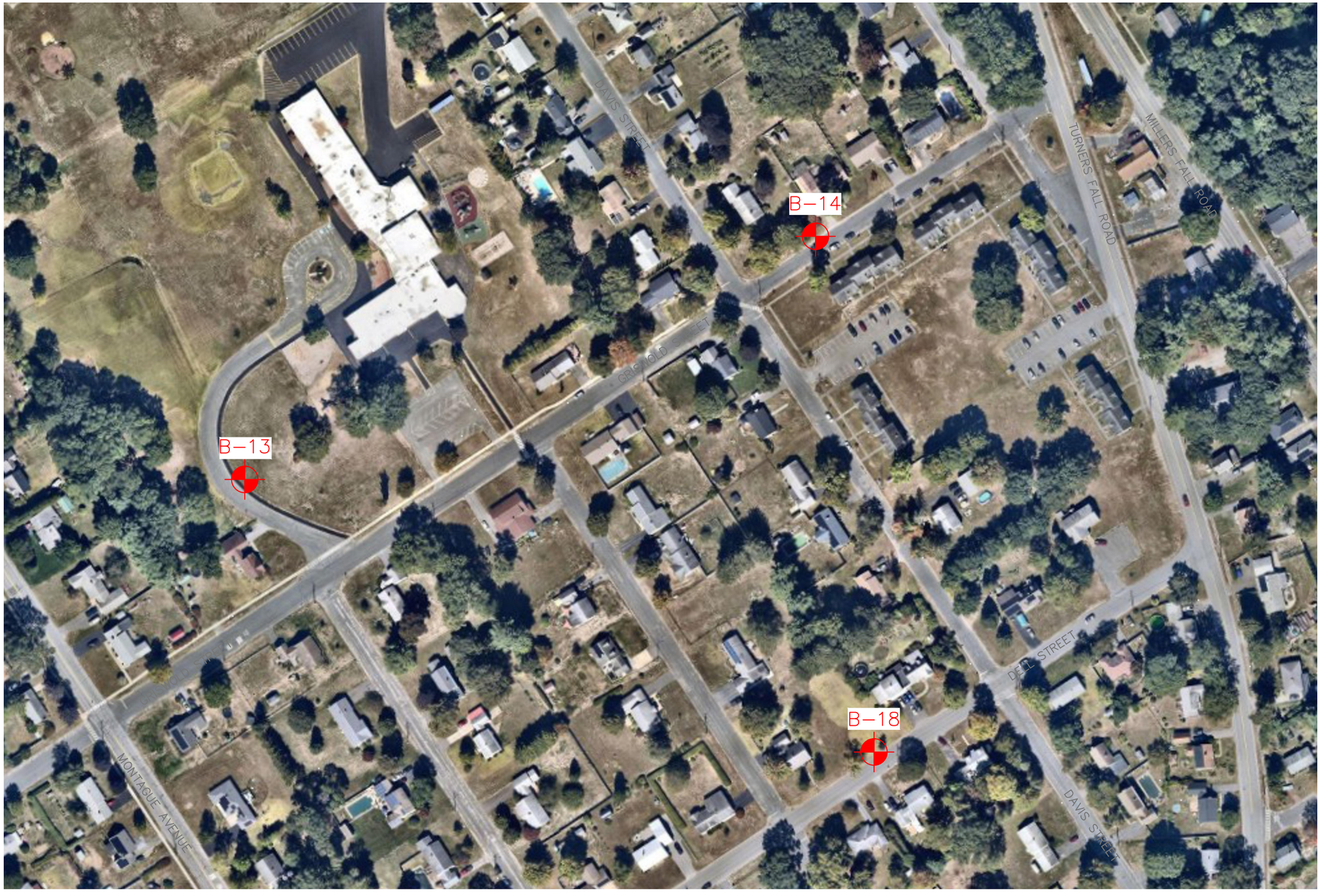
DATE: FEB 2026

FIG. 2C



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LEGEND

B-X — SOIL BORINGS

N

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HORZ.:	1" = 150'
VERT.:	-
DATUM:	
HORZ.:	MA83F
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0 75' 150'
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PROJ. No.: 120.0241314.A10
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FIG. 2D

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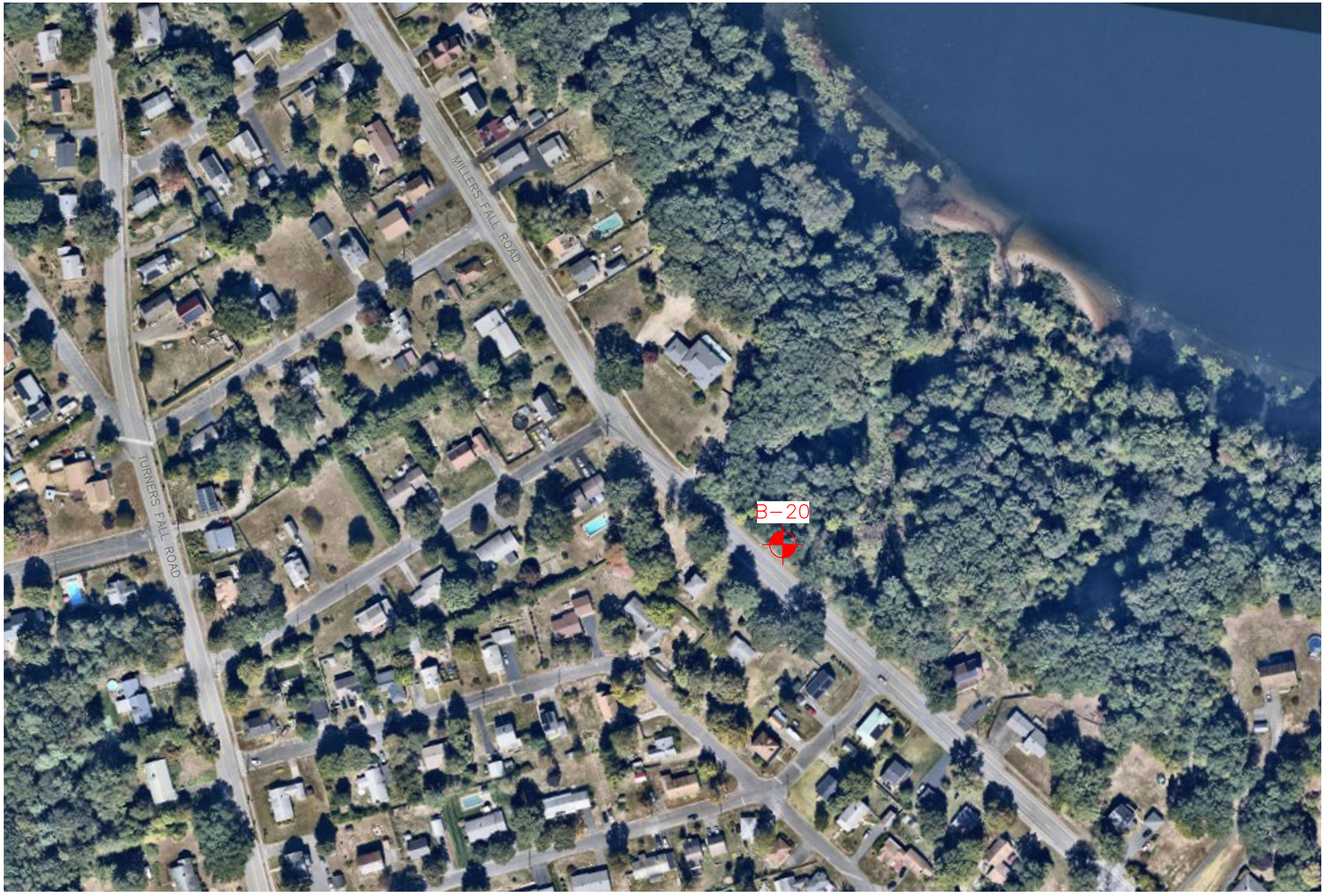
PC3: AUTOCAD PDF (GENERAL DOCUMENTATION).PC3 STB/CTB: FO.STB
LAYER STATE:
MS VIEW:



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B-X — SOIL BORINGS

N

APPROXIMATE SCALE:	
HORZ.:	1" = 150'
VERT.:	-
DATUM:	
HORZ.:	MA83F
VERT.:	NAV88

0 75' 150'

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FIG. 2E