

Attachment B

Additional Test Pit Logs and Frimpter Calculation Memo



Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

A. Facility Information

OVP Management, LLC

Owner Name

528 Boylston Street

Street Address

Newton

City

MA

State

Map 120SE, Lot 81051 0100, 0101 & 0102

Map/Lot #

02459

Zip Code

B. Site Information

- (Check one) New Construction Upgrade
 Udorthents, wet substratum; Merrimac-Urban land complex, 0 to 8 percent slopes; Hollis-Rock outcrop-Charlton complex, 0 to 15 percent slopes
- Soil Survey NRCS Web Soil Survey 655, 626B, 104C
 Source Soil Map Unit
 Outwash plains, outwash terraces, moraines, eskers, kames; ridges, hills 8-23 inches to lithic bedrock; >80 inches depth to water table
 Landform Soil Limitations
 Loamy alluvium and/or sandy glaciofluvial deposits and/or loamy glaciolacustrine deposits and/or loamy marine deposits and/or loamy basal till and/or loamy lodgment till; Loamy glaciofluvial deposits derived from granite, schist, and gneiss over sandy and gravelly glaciofluvial deposits derived from granite, schist, and gneiss; and Coarse-loamy melt-out till derived from granite, gneiss, and/or schist.
 Soil Parent material
- Surficial Geological Report 1932 - La Forge Roxbury conglomerate (Cr)
 Year Published/Source Map Unit
 Roxbury Conglomerate forms base of Boston Bay Group. Divided into Brookline, Dorchester, and Squantum Members. Conglomerate in Brookline Member contains clasts of Dedham Granite, Description of Geologic Map Unit: quartzite (possibly from Westboro Formation), and volcanic rock from underlying Mattapan Volcanic Complex.
- Flood Rate Insurance Map Within a regulatory floodway? Yes No
- Within a velocity zone? Yes No
- Within a Mapped Wetland Area? Yes No If yes, MassGIS Wetland Data Layer: Portion of the property is located in Zone AE and X.
 Wetland Type
- Current Water Resource Conditions (USGS): Ma-Wkw 2R Wayland , MA; 10/16/2024 Range: Above Normal Normal Below Normal
 Month/Day/ Year
- Other references reviewed: No Zone I, II, A, or IWPA data observed at the site. Irrigation well located at 280 Boylston Street (>3,000 linear
 (Zone II, IWPA, Zone A, EEA Data Portal, etc.) feet away from site) via EEA data portal.



Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review *(minimum of two holes required at every proposed primary and reserve disposal area)*

Deep Observation Hole Number: TP-A 10/16/2024 8:50 am Sunny; 45 degrees 42.318470 -71.191120
Hole # Date Time Weather Latitude Longitude

1. Land Use Landscape yard lot None observed None observed
(e.g., woodland, agricultural field, vacant lot, etc.) Vegetation Surface Stones (e.g., cobbles, stones, boulders, etc.)
 Description of Location: Landscaped area adjacent to residential driveway 0-3
Slope (%)

2. Soil Parent Material: Loamy glaciofluvial deposits Landscape yard N/A
Landform Position on Landscape (SU, SH, BS, FS, TS, Plain)

3. Distances from: Open Water Body >50 feet Drainage Way >50 feet Wetlands 55 feet
 Property Line >10 feet Drinking Water Well >100 feet Other N/A feet

4. Unsuitable Materials Present: Yes No If Yes: Disturbed Soil/Fill Material Weathered/Fractured Rock Bedrock

5. Groundwater Observed: Yes No If yes: N/A Depth to Weeping in Hole N/A Depth to Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA)	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-15	HTM	Gravelly loamy sand	10YR 4/2	N/A	Cnc : N/A Dpl: N/A	N/A	-	-	Granular	Friable	
15-27	HTM	Fine sand	10YR 6/4	N/A	Cnc : N/A Dpl: N/A	N/A	-	-	SG	Loose	
27-126+	HTM	Fine sand	10YR 7/2	N/A	Cnc : N/A Dpl: N/A	N/A	25	-	SG	Loose	
					Cnc : Dpl:						
					Cnc : Dpl:						
					Cnc : Dpl:						

Additional Notes:



Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review *(minimum of two holes required at every proposed primary and reserve disposal area)*

Deep Observation Hole Number: TP-B 10/16/2024 9:50 am Sunny; 46 degrees 42.318470 -71.191120
Hole # Date Time Weather Latitude Longitude

1. Land Use Landscape yard lot None observed Ledge outcroppings observed upgradient of pit
(e.g., woodland, agricultural field, vacant lot, etc.) Vegetation Surface Stones (e.g., cobbles, stones, boulders, etc.)
 Description of Location: Base of embankment slope associated with Hurley Place 0-3
Slope (%)

2. Soil Parent Material: Loamy glaciofluvial deposits Landscape yard N/A
Landform Position on Landscape (SU, SH, BS, FS, TS, Plain)

3. Distances from: Open Water Body >50 feet Drainage Way >50 feet Wetlands >100 feet
 Property Line >10 feet Drinking Water Well >100 feet Other N/A feet

4. Unsuitable Materials Present: Yes No If Yes: Disturbed Soil/Fill Material Weathered/Fractured Rock Bedrock

5. Groundwater Observed: Yes No If yes: N/A Depth to Weeping in Hole N/A Depth to Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA)	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-10	A	Loamy sand	10YR 4/3	N/A	Cnc : N/A Dpl: N/A	N/A	15	-	Granular	Friable	
10-29	Bw	Fine loamy sand	10YR 5/4	N/A	Cnc : N/A Dpl: N/A	N/A	10	-	Massive	Friable	
29-67	Cd	Loamy sand	10YR 6/4	N/A	Cnc : N/A Dpl: N/A	N/A	25	-	Massive	Friable	Refusal at 67" (assumed ledge)
					Cnc : Dpl:						
					Cnc : Dpl:						
					Cnc : Dpl:						

Additional Notes:

*Test pit terminated at approximately 67 inches due to refusal (large boulders present at bottom of pit).



Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review *(minimum of two holes required at every proposed primary and reserve disposal area)*

Deep Observation Hole Number: TP-C 10/16/2024 10:35 am Sunny; 48 degrees 42.318470 -71.191120
Hole # Date Time Weather Latitude Longitude

1. Land Use Landscape yard lot None observed None observed
(e.g., woodland, agricultural field, vacant lot, etc.) Vegetation Surface Stones (e.g., cobbles, stones, boulders, etc.)
 Slope (%) 0-3

Description of Location: Landscape yard adjacent to wooden fence in northeast corner of the lot

2. Soil Parent Material: Loamy glaciofluvial deposits Landscape yard N/A
Landform Position on Landscape (SU, SH, BS, FS, TS, Plain)

3. Distances from: Open Water Body >50 feet Drainage Way >50 feet Wetlands >100 feet
 Property Line >10 feet Drinking Water Well >100 feet Other N/A feet

4. Unsuitable Materials Present: Yes No If Yes: Disturbed Soil/Fill Material Weathered/Fractured Rock Bedrock

5. Groundwater Observed: Yes No If yes: N/A Depth to Weeping in Hole N/A Depth to Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA)	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-8	HTM	Gravelly, cobbly medium sand	10YR 4/3	N/A	Cnc : N/A Dpl: N/A	N/A	-	-	SG	Loose	
8-11	Buried asphalt	-	-	N/A	Cnc : N/A Dpl: N/A	N/A	-	-	-	-	
11-21	HTM	Loamy sand	10YR 2/2	N/A	Cnc : N/A Dpl: N/A	N/A	25	-	Massive	Friable	
21-106+	HTM	Gravelly, cobbly sand	10YR 5/3	N/A	Cnc : N/A Dpl: N/A	N/A	-	-	SG	Loose	Large boulder encountered during excavation of pit
					Cnc : Dpl:						
					Cnc : Dpl:						

Additional Notes:



Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review *(minimum of two holes required at every proposed primary and reserve disposal area)*

Deep Observation Hole Number: TP-D 10/16/2024 11:45 am Cloudy; 52 degrees 42.318470 -71.191120
Hole # Date Time Weather Latitude Longitude

1. Land Use Landscape yard lot None observed None observed
(e.g., woodland, agricultural field, vacant lot, etc.) Vegetation Surface Stones (e.g., cobbles, stones, boulders, etc.)
 Slope (%) 0-3

Description of Location: Wooded area down hill of TP-A adjacent to floodplain and wetland area

2. Soil Parent Material: Loamy glaciofluvial deposits Landscape yard N/A
Landform Position on Landscape (SU, SH, BS, FS, TS, Plain)

3. Distances from: Open Water Body >50 feet Drainage Way >50 feet Wetlands 48 feet
 Property Line >10 feet Drinking Water Well >100 feet Other N/A feet

4. Unsuitable Materials Present: Yes No If Yes: Disturbed Soil/Fill Material Weathered/Fractured Rock Bedrock

5. Groundwater Observed: Yes No If yes: N/A* Depth to Weeping in Hole N/A* Depth to Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA)	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-20	A	Loamy sand	10YR 3/3	N/A	Cnc : N/A Dpl: N/A	N/A	-	-	Granular	Friable	Roots extend to 20" below surface grade
20-32	Bw	Sandy loam	10YR 5/6	N/A	Cnc : N/A Dpl: N/A	N/A	-	-	Massive	Friable	
32-67+	C	Medium sand	10YR 5/2	42"	Cnc : 10YR 6/8 Dpl: N/A	25	-	-	SG	Loose	
					Cnc : Dpl:						
					Cnc : Dpl:						
					Cnc : Dpl:						

Additional Notes:

**Moist soil was encountered at bottom of the pit, but no side wall weeping or standing water was observed.*



Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review *(minimum of two holes required at every proposed primary and reserve disposal area)*

Deep Observation Hole Number: TP-E 10/16/2024 12:30 pm Sunny; 52 degrees 42.318470 -71.191120
Hole # Date Time Weather Latitude Longitude

1. Land Use Landscape yard lot None observed Crushed stone stockpiles located adjacent to test pit 0-3
(e.g., woodland, agricultural field, vacant lot, etc.) Vegetation Surface Stones (e.g., cobbles, stones, boulders, etc.) Slope (%)

Description of Location: Landscape yard lot adjacent to southern landscape material stockpiles

2. Soil Parent Material: Loamy glaciofluvial deposits Landscape yard N/A
Landform Position on Landscape (SU, SH, BS, FS, TS, Plain)

3. Distances from: Open Water Body >50 feet Drainage Way >50 feet Wetlands >100 feet
 Property Line >10 feet Drinking Water Well >100 feet Other N/A feet

4. Unsuitable Materials Present: Yes No If Yes: Disturbed Soil/Fill Material Weathered/Fractured Rock Bedrock

5. Groundwater Observed: Yes No If yes: N/A Depth to Weeping in Hole N/A Depth to Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA)	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-42	HTM	Cobbly, stony sand	10YR 5/2	N/A	Cnc : N/A Dpl: N/A	N/A	-	-	SG	Loose	Buried roots observed between 30-42" below surface grade
42-74+	Cd	Cobbly, stony loamy sand	10YR 4/2	N/A	Cnc : N/A Dpl: N/A	N/A	-	-	Massive	Friable	
					Cnc : Dpl:						
					Cnc : Dpl:						
					Cnc : Dpl:						
					Cnc : Dpl:						

Additional Notes:



Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review *(minimum of two holes required at every proposed primary and reserve disposal area)*

Deep Observation Hole Number: TP-F 10/16/2024 1:20 pm Sunny; 52 degrees 42.318470 -71.191120
Hole # Date Time Weather Latitude Longitude

1. Land Use Landscape yard lot None observed Crushed stone stockpiles located adjacent to test pit 0-3
(e.g., woodland, agricultural field, vacant lot, etc.) Vegetation Surface Stones (e.g., cobbles, stones, boulders, etc.) Slope (%)

Description of Location: Landscape yard lot adjacent to southern landscape material stockpiles

2. Soil Parent Material: Loamy glaciofluvial deposits Landscape yard N/A
Landform Position on Landscape (SU, SH, BS, FS, TS, Plain)

3. Distances from: Open Water Body >50 feet Drainage Way >50 feet Wetlands >100 feet
 Property Line >10 feet Drinking Water Well >100 feet Other N/A feet

4. Unsuitable Materials Present: Yes No If Yes: Disturbed Soil/Fill Material Weathered/Fractured Rock Bedrock

5. Groundwater Observed: Yes No If yes: N/A Depth to Weeping in Hole N/A Depth to Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA)	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-71	HTM	Cobbly, stony sand	10YR 5/2	N/A	Cnc : N/A Dpl: N/A	N/A	-	-	SG	Loose	
71-91+	Cd	Cobbly, stony loamy sand	10YR 4/2	N/A	Cnc : N/A Dpl: N/A	N/A	-	-	Massive	Friable	
					Cnc : Dpl:						
					Cnc : Dpl:						
					Cnc : Dpl:						
					Cnc : Dpl:						

Additional Notes:



Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review *(minimum of two holes required at every proposed primary and reserve disposal area)*

Deep Observation Hole Number: TP-G 10/16/2024 1:55 pm Sunny; 54 degrees 42.318470 -71.191120
Hole # Date Time Weather Latitude Longitude

1. Land Use Landscape yard lot None observed Crushed stone stockpiles located adjacent to test pit 0-3
(e.g., woodland, agricultural field, vacant lot, etc.) Vegetation Surface Stones (e.g., cobbles, stones, boulders, etc.) Slope (%)

Description of Location: Landscape yard lot adjacent to northern landscape material stockpiles

2. Soil Parent Material: Loamy glaciofluvial deposits Landscape yard N/A
Landform Position on Landscape (SU, SH, BS, FS, TS, Plain)

3. Distances from: Open Water Body 40* feet Drainage Way >50 feet Wetlands >100 feet
 Property Line >10 feet Drinking Water Well >100 feet Other N/A feet

4. Unsuitable Materials Present: Yes No If Yes: Disturbed Soil/Fill Material Weathered/Fractured Rock Bedrock

5. Groundwater Observed: Yes No If yes: N/A Depth to Weeping in Hole N/A Depth to Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA)	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-11	HTM	Gravelly fine sand	10YR 6/4	N/A	Cnc : N/A Dpl: N/A	N/A	-	-	SG	Loose	
11-18	HTM	Gravelly sand	10YR 5/6	N/A	Cnc : N/A Dpl: N/A	N/A	-	-	SG	Loose	
18-28	HTM	Gravelly, cobbly sand	10YR 6/3	N/A	Cnc : N/A Dpl: N/A	N/A	-	-	SG	Loose	
28-52	HTM	Gravelly, cobbly medium sand	10YR 6/3	N/A	Cnc : N/A Dpl: N/A	N/A	-	-	SG	Loose	Old HDPE drainage pipe encountered 36" below surface.
52-55	Buried asphalt	-	-	N/A	Cnc : N/A Dpl: N/A	N/A	-	-	-	-	
55-61	HTM	Gravelly medium sand	10YR 6/3	N/A	Cnc : N/A Dpl:	N/A	-	-	SG	Loose	

Additional Notes:

**Open water body is Paul Brook on western portion of the site.*



Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review *(minimum of two holes required at every proposed primary and reserve disposal area)*

Deep Observation Hole Number: TP-G 10/16/2024 1:55 pm Sunny; 54 degrees 42.318470 -71.191120
Hole # Date Time Weather Latitude Longitude

1. Land Use Landscape yard lot None observed Crushed stone stockpiles located adjacent to test pit 0-3
(e.g., woodland, agricultural field, vacant lot, etc.) Vegetation Surface Stones (e.g., cobbles, stones, boulders, etc.) Slope (%)

Description of Location: Landscape yard lot adjacent to northern landscape material stockpiles

2. Soil Parent Material: Loamy glaciofluvial deposits Landscape yard N/A
Landform Position on Landscape (SU, SH, BS, FS, TS, Plain)

3. Distances from: Open Water Body 40* feet Drainage Way >50 feet Wetlands >100 feet
 Property Line >10 feet Drinking Water Well >100 feet Other N/A feet

4. Unsuitable Materials Present: Yes No If Yes: Disturbed Soil/Fill Material Weathered/Fractured Rock Bedrock

5. Groundwater Observed: Yes No If yes: N/A Depth to Weeping in Hole N/A Depth to Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA)	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
61-96+	C	Loamy sand	10YR 3/2	N/A	Cnc : N/A Dpl: N/A	N/A	25	-	Massive	Friable	
					Cnc : Dpl:						
					Cnc : Dpl:						
					Cnc : Dpl:						
					Cnc : Dpl:						
					Cnc : Dpl:						

Additional Notes:

*Open water body is Paul Brook on western portion of the site.



Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

D. Determination of High Groundwater Elevation

1. Method Used (Choose one):

Depth to soil redoximorphic features

Obs. Hole # TP-D

Obs. Hole # _____

42 inches

_____ inches

Depth to observed standing water in observation hole

_____ inches

_____ inches

Depth to adjusted seasonal high groundwater (S_h)
(USGS methodology)

_____ inches

_____ inches

Index Well Number _____

Reading Date _____

$$S_h = S_c - [S_r \times (OW_c - OW_{max}) / OW_r]$$

Obs. Hole/Well# _____ S_c _____ S_r _____ OW_c _____ OW_{max} _____ OW_r _____ S_h _____

*Refer to attached supporting documentation associated with Frimpter calculation for TP-07 observed on December 7, 2023.

E. Depth of Pervious Material (Not Applicable)

1. Depth of Naturally Occurring Pervious Material

a. Does at least four feet of naturally occurring pervious material exist in all areas observed throughout the area proposed for the soil absorption system?

Yes No

b. If yes, at what depth was it observed (exclude O, A, and E Horizons)?

Upper boundary: _____
inches

Lower boundary: _____
inches

c. If no, at what depth was impervious material observed?

Upper boundary: _____
inches

Lower boundary: _____
inches



Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

F. Certification

I certify that I am currently approved by the Department of Environmental Protection pursuant to 310 CMR 15.017 to conduct soil evaluations and that the above analysis has been performed by me consistent with the required training, expertise and experience described in 310 CMR 15.017. I further certify that the results of my soil evaluation, as indicated in the attached Soil Evaluation Form, are accurate and in accordance with 310 CMR 15.100 through 15.107.

Jared Walsh
Signature of Soil Evaluator

10/17/2023
Date

Jared Walsh / License #14670
Typed or Printed Name of Soil Evaluator / License #

11/01/2025
Expiration Date of License

N/A
Name of Approving Authority Witness

N/A
Approving Authority

Note: In accordance with 310 CMR 15.018(2) this form must be submitted to the approving authority within 60 days of the date of field testing, and to the designer and the property owner with [Percolation Test Form 12](#).

Field Diagrams: Use this area for field diagrams:

MEMORANDUM

Date: October 17, 2024

Re: Frimpter Calculation
528 Boylston Street
Proposed Residential Development

To support this proposed development proposal, a total of thirteen (13) test pits have been performed by a Bohler Soil Evaluator licensed in the State of Massachusetts in accordance with the Massachusetts Stormwater Handbook. Testing occurred in December 2023 and October 16, 2024. These test pits were inclusive of required test pits within the footprint of the proposed infiltration system areas and within 25-feet as permitted through the local City of Newton regulations. This development specific testing was in addition to approximately eighteen (18) geotechnical borings and test pits conducted during assessments of previous development proposals.

To establish the Estimated Seasonal High Groundwater elevations (ESHGW), observed soil mottling, visible groundwater, weeping and other evidence was gathered, along with record soil mapping and local well data. Additionally, as requested in the BSC Peer Review letter in accordance with local Newton requirements, the enclosed Frimpter Method Analysis was performed on the observed water elevation to confirm the design ESHGW is appropriate.

The Frimpter Method analysis includes a correlation of recorded historical and real time groundwater data taken at the index groundwater monitoring observation well to conditions discovered at the Site. Selection of the appropriate index well must consider wells with similar depths to groundwater, wells that are located in closest proximity to the Site, and wells that are located on similar landforms. The index well selected for correlation was USGS well No. 421852071220501 in Wayland, Massachusetts. The index well is approximately 9 miles from the Site, is located on a terrace, and has a very similar depth to groundwater.

A critical value in the calculation to determine the corresponding estimated groundwater elevation is the selection of the S_R value (range of anticipated water level fluctuation where the Site is located), as this is directly proportional to the resulting estimated probable high groundwater on the site. The S_R value identifies the range of water level fluctuations that are exceeded at 5% of sites in Massachusetts based on the soil type and landform of the Site. The Frimpter Method includes only two different soil types for analysis: tills and sands and gravels. The sands and gravels are further broken down by location and whether they are on terraces or in valleys.

Figure 11 from the report entitled "Probable High Ground-Water Levels in Massachusetts" by Michael Frimpter, dated March 1981 (herein the "Report") identifies that the Sites in Massachusetts with sands and gravels in terraces have water level ranges that vary from approximately 3 feet to 10 feet. Approximately 5% of sites containing sand and gravel on

terraces have water level ranges that exceed 10 feet ($S_R = 10.0$). **Figure 12** from the Report identifies that Sites in Massachusetts with sand and gravel in valley flats have water level ranges that vary from 2 feet to approximately 4.3 feet. Approximately 5% of sites containing sand and gravel in valley flats have water level ranges that exceed 4.2 feet ($S_R = 4.2$). **Figures 11 and 12** from the Report are attached for reference and the mathematical expression to determine the probable high water level at the Site (S_H) is given by:

$$S_H = S_C - (S_R / O_{WR}) \times (O_{WC} - O_{WMAX})$$

Where:

- S_H = Probable high water level at the Site.
 S_C = Measured depth to water at the Site.
5.33 ft (reading taken on 12/07/2023 @ TP-7; System 2P*)
** none of the other 12 Bohler test pits recorded S_C – Observed Water*
- S_R = Range of water level where the Site is located.
4.2 ft (sands and gravels in valley flats - Figure 12)
- O_{WR} = Recorded upper limit of annual range of water level at the observation well which is used to correlate with water levels at the Site.
3.7 ft (USGS well No. 421852071220501 - Wayland, MA)
- O_{WC} = Measured depth to water in the observation well which is used to correlate with water levels at the Site.
15.85 ft (USGS Well No. 421852071220501 - Wayland, MA on 12/07/2023)
- O_{WMAX} = Depth to recorded maximum water level at the observation well which is used to correlate with the water levels at the Site.
13.5 ft (USGS Well No. 421852071220501 - Wayland, MA)

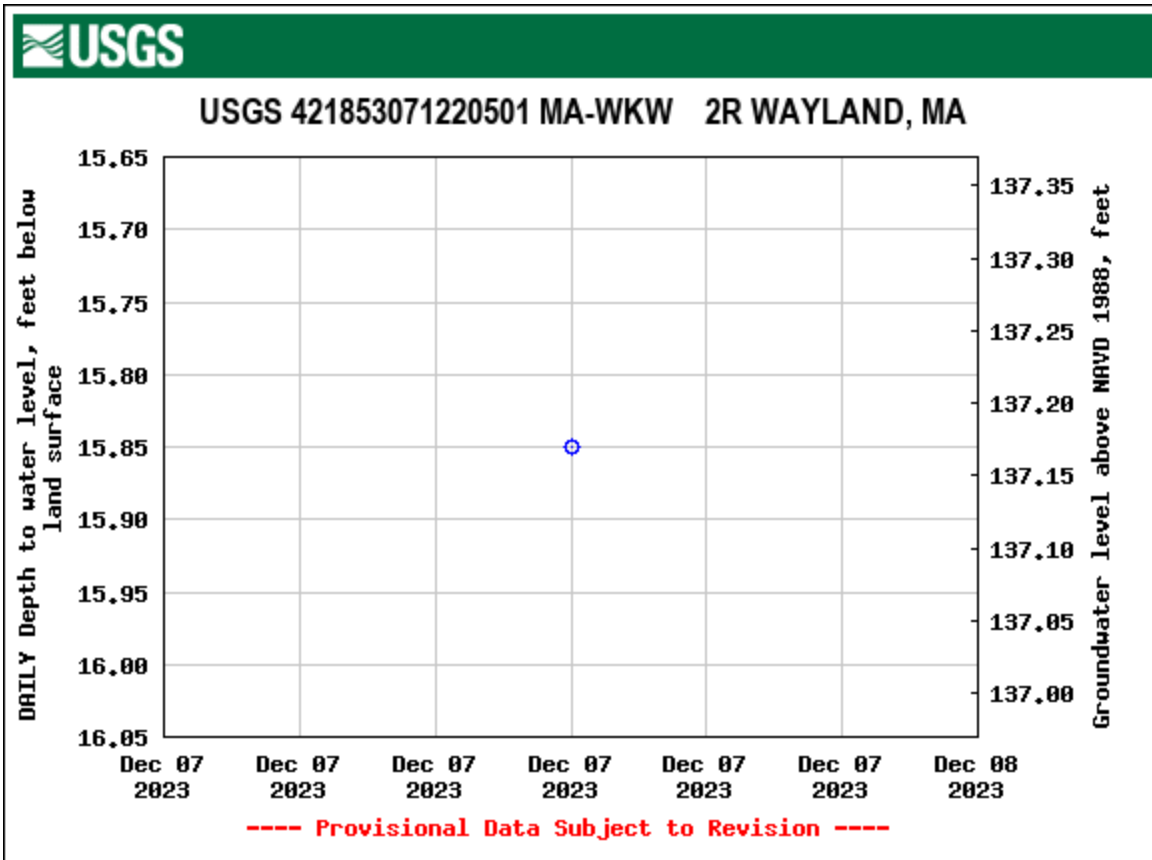
In order to estimate the depth of probable high water level, the S_R value from **Figure 12**, "Probability of water-level range in sand and gravel in valley flats" was then evaluated. The National Resource Conservation Service (NRCS) defines the term "valley flat" as "a generic term for the low or relatively level ground lying between valley walls and bordering a stream channel; especially the small plain at the bottom of a narrow, steep-sided valley". Considering the physical evidence from the previously performed test pits in proximity to the floodplain associated with the Paul Brook, the geologic setting of the Site, and the surrounding landforms, the S_R value associated with sands and gravels in valley flats is the most appropriate factor to use in the Frimpter Method calculation of probable high water level. Utilizing the S_R value of 4.2 feet from **Figure 12**, the resulting S_H value is calculated to be 2.66 (approximately 2.7) feet below the ground surface (El. 123.5). This estimated depth of probable high water level is conservative when compared to the elevation of the observed redoximorphic features in the test pit excavation denoted as "TP-7" that was performed on December 7, 2023. The approximate depth of the observed redoximorphic features was measured to be 3.08 (approximately 3.1) feet

below ground surface (El. 123.1). Based on the considerations noted above and utilizing the Frimpter Method calculation, the estimated depth of probable high water levels at the Site is conservatively taken to be approximately 2.7 feet from the ground surface (El. 123.5).

The Frimpter Test results and comparison to longer term area observation well data proves consistent, albeit slightly higher (0.4-feet), with all of the previously stated Estimated Seasonal High Groundwater Elevations utilized throughout the design of this proposed development and as previously stated, the stormwater design meets and exceeds the City of Newton Stormwater Requirements and the Massachusetts Stormwater Handbook requirements.

Attachments

- Depth to Water Level Graph (USGS Well No. 421852071220501 - Wayland, MA)
- Figure 11 – "Probability of water-level range in sand and gravel on terraces"
- Figure 12 – "Probability of water-level range in sand and gravel in valley flats"



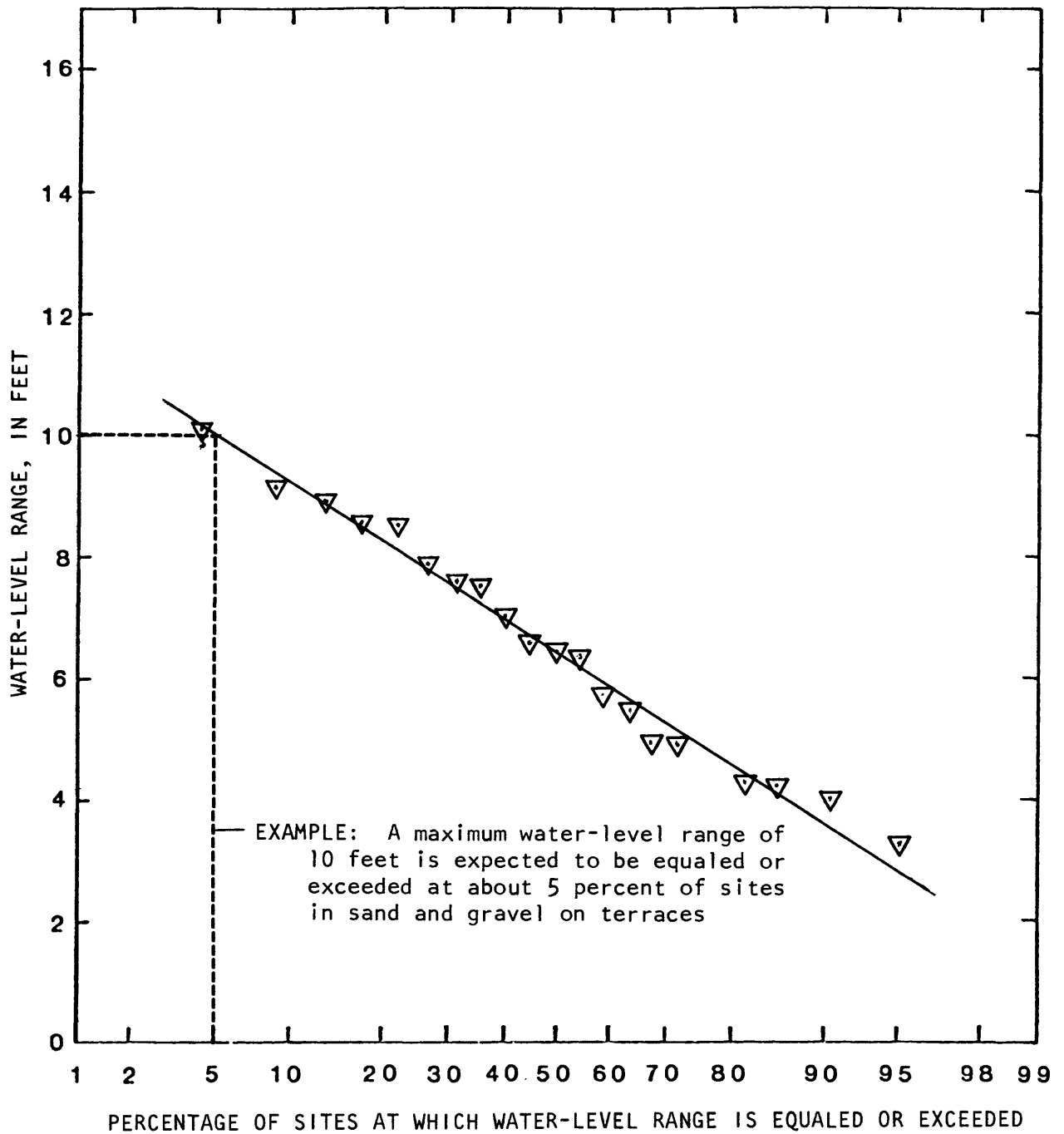


Figure 11.--Probability of water-level range in sand and gravel on terraces

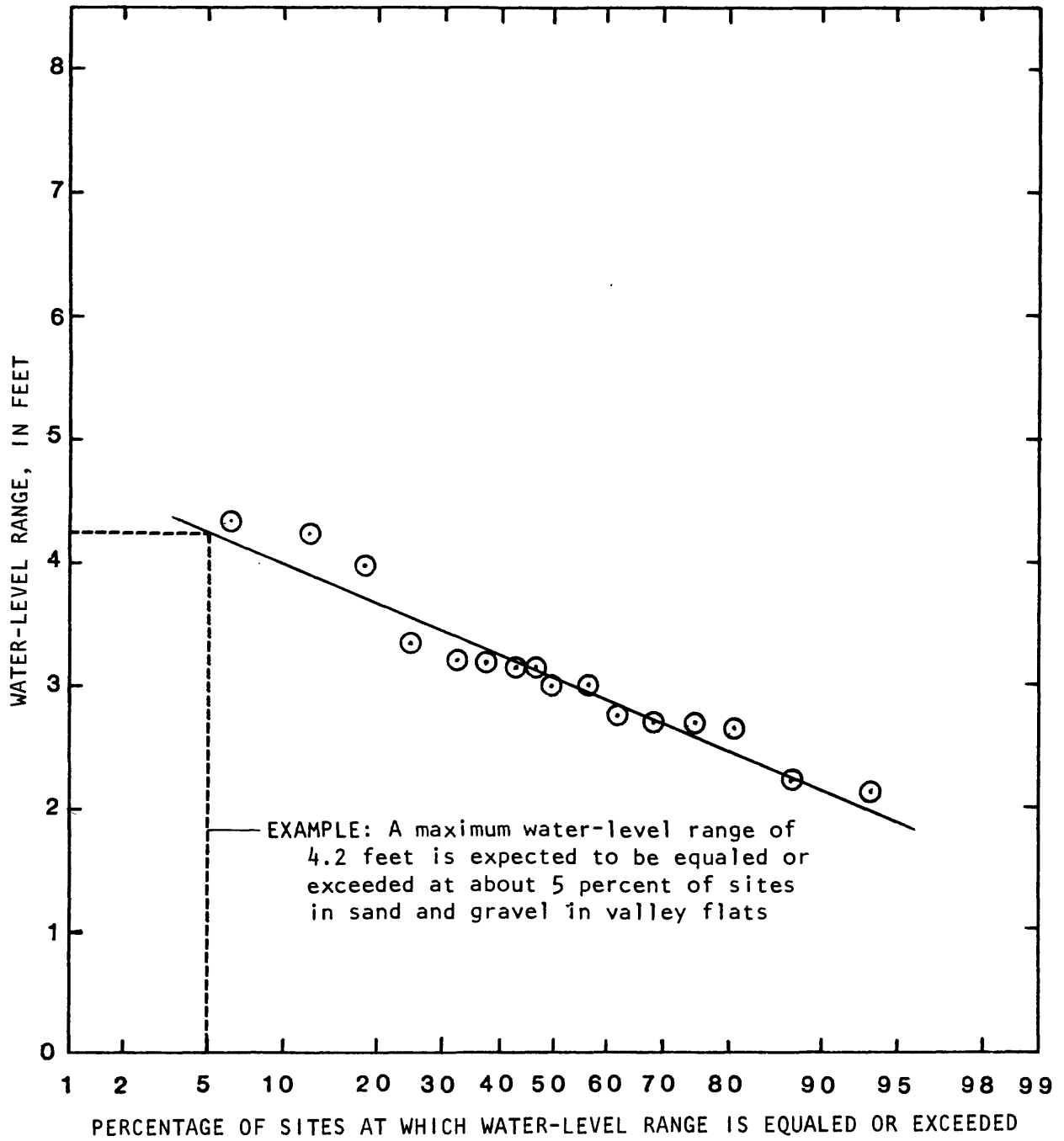


Figure 12.--Probability of water-level range in sand and gravel in valley flats