

1. EPS Recommendations - Addendum Letter No. 1 / Juniper YT Site 6.6 GT Report Dated 02.12.21
Solicitation #5454 - Addendum #2



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June 11, 2021

Seattle Housing Authority
190 Queen Anne Avenue North
Seattle, Washington 98109-1028

Attention: Sandy Miller and Lori Stehlik

Subject: EPS Recommendations - Addendum No. 1
Juniper Development (Block 6.6)
Yesler Terrace Redevelopment Project
Seattle, Washington
File No. 0241-037-00

The purpose of this letter is to provide additional recommendations for use of expanded polystyrene (EPS) fill applications for the P-patches on the south side of the building and between the seismic gap and the north side of the Juniper building. This letter is issued as Addendum No. 1 to our geotechnical report dated February 12, 2021.

Expanded Polystyrene

EPS, also known as Geofoam, is a high-performance, light-weight, fill material. The density of EPS typically ranges from about 0.7 to 2.9 pounds per cubic foot (pcf). EPS is typically manufactured in blocks measuring 2 to 4 feet high, 4 feet wide, and 8 to 12 feet long. The EPS is planned to be used as lightweight fill in the P-patch area on the south side of the building, and as fill between the north side of the building and the seismic gap with the Block 6 private access drive cylinder pile wall.

P-patches: South Side of Building

Figure 1 presents a typical EPS section for the P-patch area. The EPS block geometry is designed to support 3 feet of planting soil and associated concrete retaining walls. We recommend using a combination of Type EPS39 geofoam and Type EPS15 geofoam to construct the P-patches at the proposed grades. EPS39 is recommended in the upper 2 feet and EPS15 is recommended below the upper 2 feet. The EPS blocks should be placed and connected per the manufacturer's recommendations using gripper plates. Each row of blocks should be 2 or 4 feet high, unless needed otherwise. Crushed gravel (Seattle Type 24) should be placed and compacted as a leveling pad at the base of the blocks and between the slope and the edges of the blocks, as needed. A 40-mil linear low-density polyethylene (LLDPE) double-sided textured geomembrane should be placed over the upper row of EPS blocks to protect the EPS from deterioration from possible risk of hydrocarbons. If the Seattle Housing Authority (SHA) determines that the risk of a hydrocarbon release is low, then the geomembrane can be eliminated from the design.



We recommend that a 4-inch-diameter perforated drainpipe be placed at the back edge of the lowest EPS block layer to help reduced the potential for hydrostatic pressure to build up. The drainpipe should be surrounded with at least 6 inches of gravel backfill for drains wrapped in a nonwoven geotextile filter fabric (Mirafi 140N, or equivalent). The perforated drainpipe may be connected to solid pipes to convey the discharge to an appropriate discharge location.

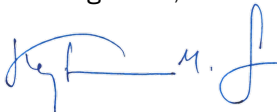
The EPS block wall facing may consist of: (1) wire mesh with about 2 inches of shotcrete (enough shotcrete to cover the wire mesh) or (2) lightweight faux stone wall panels. Faux stone panels may be applied to the EPS blocks using compatible adhesives per the manufacturer's recommendations, and durability of the faux stone panels should be considered. The edge of cast-in-place retaining walls should be fully supported on the EPS blocks. The EPS facing may extend up on the cast-in-place wall as well.

North Side of Building

Figure 2 presents a typical section where EPS will be used as backfill between the seismic gap along the Block 6 private access drive cylinder piles and the Juniper Building. EPS39 is recommended in the upper 4 feet and EPS15 is recommended below the upper 4 feet. The EPS blocks should be placed and connected using gripper plates per the manufacturer's recommendations. Each row of blocks should be 2 or 4 feet high, unless needed otherwise. Crushed gravel (Seattle Type 24) should be placed and compacted as a leveling pad at the base of the blocks. A 40-mil LLDPE double-sided textured geomembrane should be placed over the upper row of EPS blocks to protect the EPS from hydrocarbon degradation. The edge of cast-in-place retaining wall should be fully supported on the EPS blocks.

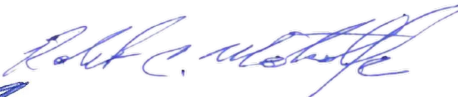
We trust this letter serves your current needs. Please call if you have any questions or require additional information.

Sincerely,
GeoEngineers, Inc.


Kyle M. Smith, PE
Geotechnical Engineer

KMS:RCM:nld




Robert C. Metcalfe, PE, LEG
Principal

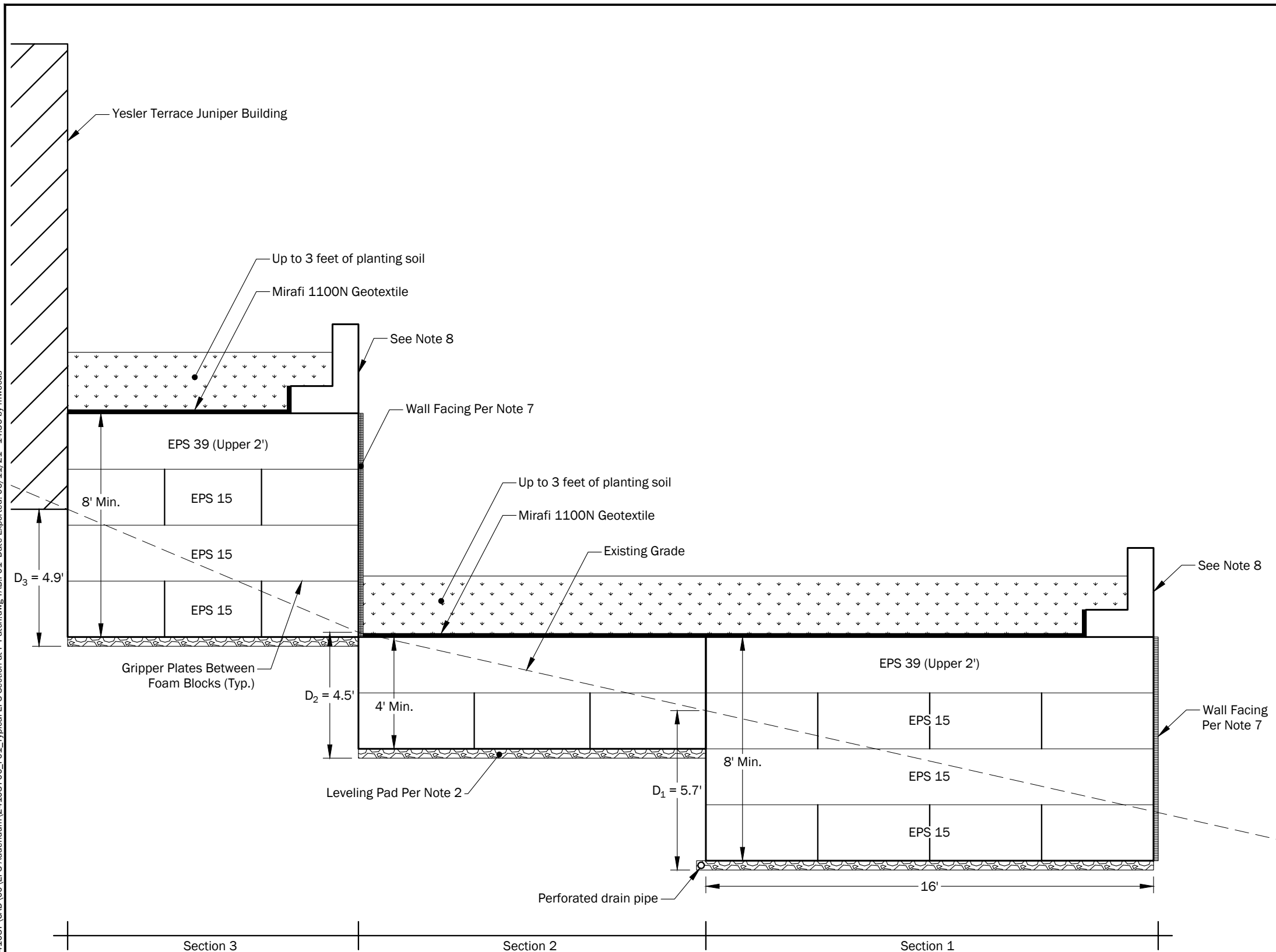
Attachments:




Figure 1. Typical EPS Section for P-Patches

Figure 2. Typical EPS Section on North Side of Building

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\\geoengineers.com\WAM\Projects\024-1037\CAD\00-EPS Addendum\24103700_F01_Typical EPS Section at P-Patch.dwg TAB:F01 Date Exported: 06/11/21 - 14:36 by mwoods




- Legend**
-  Landscape Per Plans
 -  Wall Facing
 -  Leveling Pad
- D₁ = Minimum Excavation Depth from Existing Grade for Section 1, Feet
D₂ = Minimum Excavation Depth from Existing Grade for Section 2, Feet
D₃ = Minimum Excavation Depth from Existing Grade for Section 3, Feet

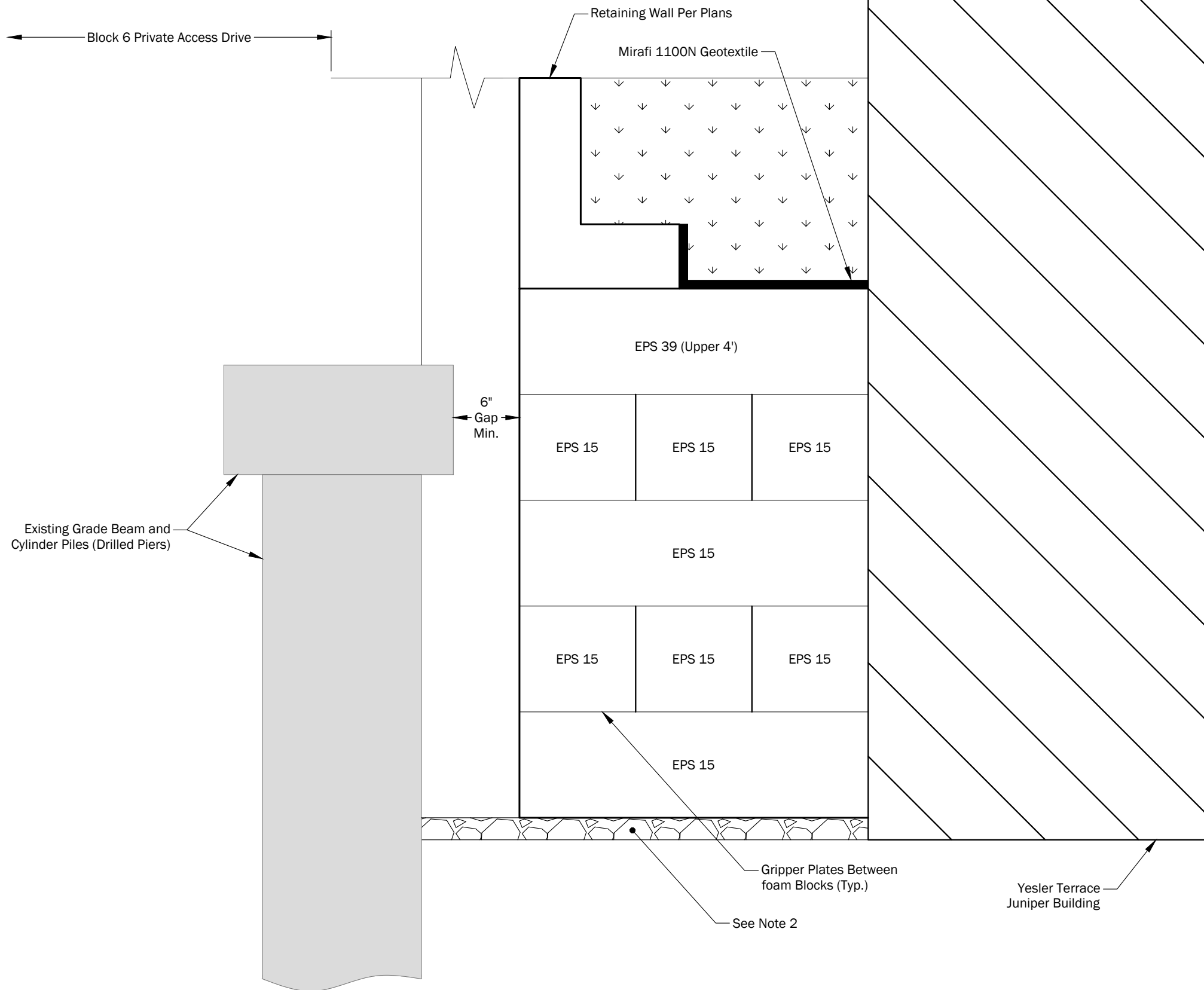
- Notes:**
1. Temporary open cuts should be planned in the existing site soils no steeper than 1.5H:1V; however cuts to bench the EPS blocks into the slope may be made near vertical if less than 4 feet high and if exposed for less than 1 day.
 2. EPS blocks should be placed tightly together and on a prepared leveling pad consisting of at least 4 inches of City of Seattle Mineral Aggregate Type 24 (1/2-inch minus crushed gravel). The Type 24 gravel should also be placed to fill gaps between the slope and EPS blocks as they are installed.
 3. EPS blocks placed in a row in a particular layer should be offset 2 feet relative to blocks placed in adjacent rows of the same layer. In addition, to avoid continuous vertical joints, each subsequent layer of blocks should be rotated 90 degrees (horizontal plane) from the direction of placement of the underlying row.
 4. EPS blocks shall be fastened to one another using gripper plates, per the manufacturer's recommendations.
 5. EPS blocks should be cut using a hot wire.
 6. The contractor must protect the EPS blocks from damage, including for weather, such as wind and rain. The light-weight nature of the EPS blocks makes them susceptible to wind damage.
 7. Wall facing on EPS blocks may consist of 1) wire mesh with approximately 2 inches of shotcrete or 2) light-weight foax stone wall panels. Foax stone wall panels may be applied to the EPS blocks using compatible adhesives per manufacturer's recommendations.
 8. The edge of the cast-in-place retaining wall shall be fully supported on the EPS blocks. The wall facing on the EPS geofoam face may extend up on the cast-in-place wall.



- General Notes:**
- The locations of all features shown are approximate.
 - This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Not to Scale

Typical EPS Section for P-Patches	
Yesler Terrace Juniper (Block 6.6) Seattle, Washington	
	Figure 1

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- Legend**
-  Landscape Per Plans
 -  Leveling Pad

Notes:

1. EPS blocks should be placed tightly together and on a prepared leveling pad consisting of at least 4 inches of City of Seattle Mineral Aggregate Type 24 (1/2-inch minus crushed gravel).
2. EPS blocks placed in a row in a particular layer should be offset 2 feet relative to blocks placed in adjacent rows of the same layer. In addition, to avoid continuous vertical joints, each subsequent layer of blocks should be rotated 90 degrees (horizontal plane) from the direction of placement of the underlying row.
3. EPS blocks shall be fastened to one another using gripper plates, per the manufacturer's recommendations.
4. EPS blocks should be cut using a hot wire.
5. The contractor must protect the EPS blocks from damage, including for weather, such as wind and rain. The light-weight nature of the EPS blocks makes them susceptible to wind damage.

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Not to Scale

Typical EPS Section on North Side of Building

Yesler Terrace Juniper (Block 6.6)
Seattle, Washington



Figure 2