

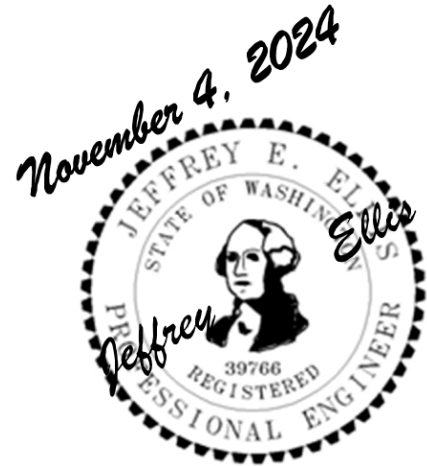
MR 1-9 Storm Drainage Report Zimmer Residence

4661 Forest Avenue SE
Mercer Island, WA 98040
APN 404500-0065

9,255 SF Impervious

November 4, 2024

Co-authored by
Stephenie Seawall
Duffy Ellis, P.E.



General:

This site's new and replaced impervious area is **ABOVE 5,000** sf, site is subject to minimum DOE requirements MR1-9 identified below.

| | |
|--|--|
| MR1 = Preparation of Storm Water Site Plans | See C2.0 Drainage Plan |
| MR2 = Construction Storm Water Pollution Prevention Plan | See C1.0 TESCP in plan set. See the CSWPPP in the appendix |
| MR3 = Source Control of Pollution | See C1.0 for erosion control measures recommended to mitigate erosion and sediment discharge from site during construction phase. |
| MR4 = Preservation of Natural Drainage Systems and Outfalls | This lot fronts and drains into lake Washington. Runoff from the roof and driveway are collected and connected to an existing private storm drain to the lake. We discuss MR4 in more depth on page 5. |
| MR5 = On-site Stormwater Management | Stormwater BMP's are not proposed on this lake front lot for many reasons. We discuss further in section MR5 of report. |
| MR6 = Runoff Treatment | Runoff treatment does not meet the 5,000 sf area threshold. The total on-site PGIS area is about 4,800 sf including resurfacing the driveway |

| | |
|---|---|
| MR7 = Flow Control | Detention (flow control) should not be required per a direct discharge exemption. |
| MR8 = Wetlands Protection | N/A – no wetlands in vicinity to our knowledge |
| MR9 = Operations and Maintenance | N/A – not warranted unless requested |

Background:

This lakefront lot is located on the western shoreline of Mercer Island roughly half-way down the western shore of Mercer Island. A new house is proposed along with improvements to the driveway access as depicted on both civil and architectural site plans. Ripple Design Studio is the architect.

This lot slopes westerly at an average grade of 26% toward the lake. Our storm design plan proposes collection of all roof and driveway stormwater and conveyed via storm to Lake Washington. Please see our design on sheet C2.0 of the building permit set. Detention is not required since project is adjacent to the lake.

Vicinity Map



Soils and Infiltration Feasibility:

This site is mapped as “Infiltration LID facilities are not permitted” on the “Low impact development infiltration feasibility on Mercer Island” map. Also the project geologist (Pangeo) mentions fill and clay soil, which are not good for infiltration. Infiltration is not proposed for this project.

MR 4 Preservation of Natural Drainage Systems and Outfalls

MR#4 Definition

Natural drainage patterns shall be maintained, and discharges from the project site shall occur at the natural location, to the maximum extent practicable. The manner by which runoff is discharged from the project site must not cause a significant adverse impact to downstream receiving waters and downgradient properties. All outfalls require energy dissipation. (ref DOE Manual, I-2.5.4)

Response

All runoff is collected and discharged into Lake Washington. This will mimic the natural topography and historic drainage pattern for this lot.

MR#4 Objective

To preserve and utilize natural drainage systems to the fullest extent because of the multiple stormwater benefits these systems provide; and to prevent erosion at and downstream of the discharge location. (ref DOE Manual, I-2.5.4)

Response

Manmade conveyance is existing condition. This is a noble object in the suburban area but there are no natural drainage conveyance discharge options available to our knowledge.

MR5 = On-site Stormwater Management

The List Approach (using List #2) selection process was applied to site to evaluate feasibility of BMP's (reference 2014 DOE Manual):

Lawn and Landscaped Areas:

- **Post-Construction Soil Quality and Depth** in accordance with BMP T5.13 in Chapter 5 of Volume V of the DOE Manual.
Compost-Amended Soil is required and proposed.

Roof Surface BMP Evaluation:

- **Full Dispersion:**
Infeasible: A minimum native vegetative flowpath length of 100 lineal feet is not achievable nor allowed as a BMP option on Mercer Island to best of our knowledge.

- **Downspout Full Infiltration:**
Infeasible: “Infiltrating LID facilities are not permitted” at this area per mapping. We have therefore not proposed. Infiltration when adjacent to major bodies of water like Lake Washington typically not feasible or advised for many reasons.
- **Bioretention:**
Bioretention BMP’s adjacent to major bodies of water like Lake Washington typically not proposed for many reasons.
- **Downspout Dispersion:**
Not a permitted BMP on Mercer Island
- **Perforated Stub-out Connection:**
This infiltration BMP is not appropriate for this lot adjacent to Lake Washington

Driveway Surface BMP Evaluation:

- **Full Dispersion:**
Infeasible due to lack of 100 LF flowpath. Also Mercer Island code is very restrictive about allowing these.
- **Permeable Pavement:**
Infeasible: “Infiltrating LID facilities are not permitted” at this area; see “Low impact development infiltration feasibility on Mercer Island” map in the appendix of this report.

We also don’t recommend permeable pavement given the context of the driveway and autocourt location upgradient of the house and basement foundation.

- **Bioretention:**
Not even close to being feasible to locate a rain garden to serve the driveway.
- **Sheet Flow Dispersion / Concentrated Flow Dispersion:**
Not even close to being feasible to propose sheet flow dispersion on this lot.

Attachments

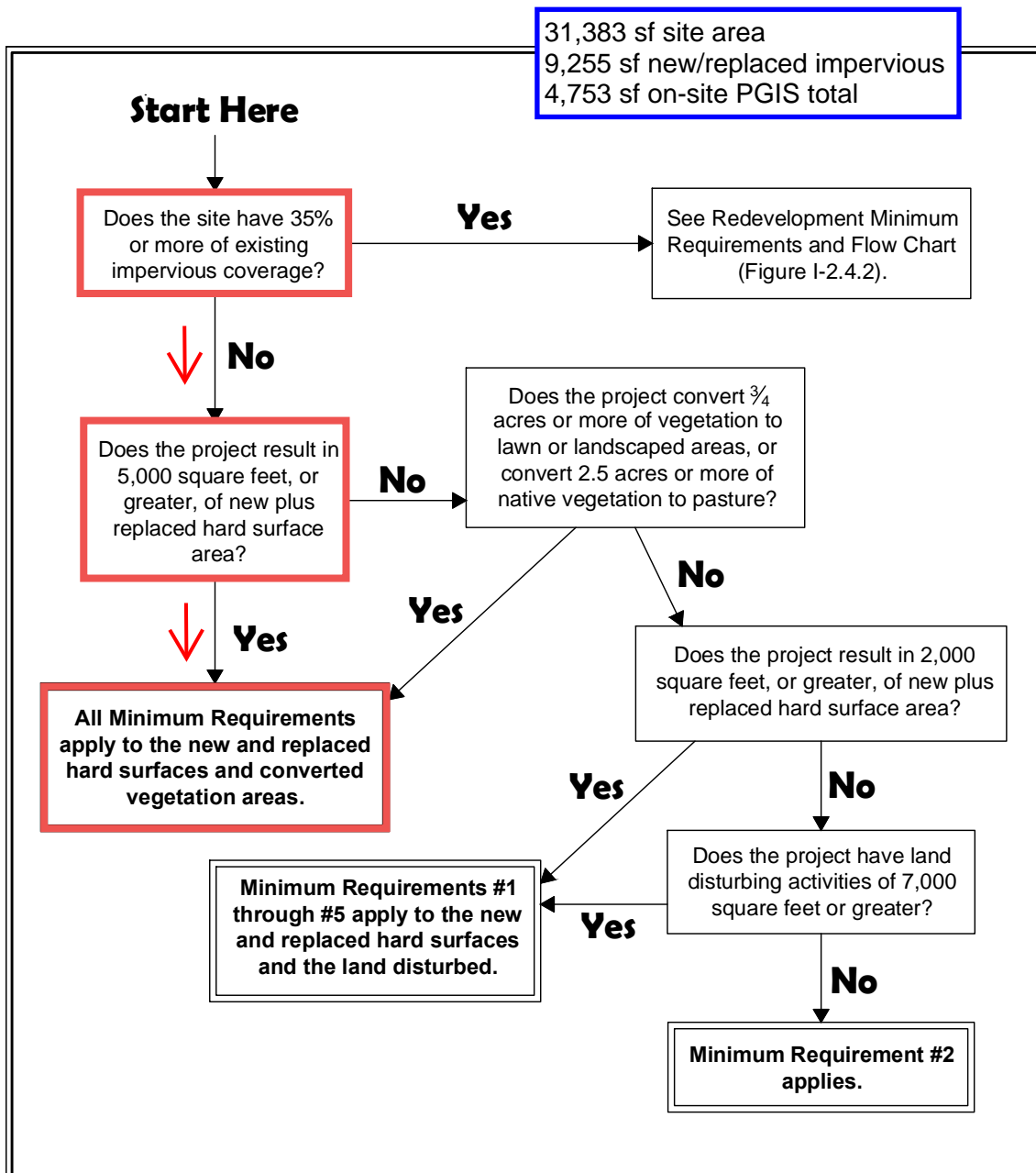
- Impervious Area Spreadsheet
- DOE Flowchart for Determining Requirements for New Development showing MR1-9
- Geotechnical Report by PanGEO, July 6, 2022
- Low impact development infiltration feasibility on Mercer Island map (infiltration feasibility map)
- CSWPPP

Impervious Area Spreadsheet - Stormwater Version

Zimmer Residence - 4661 Forest Avenue SE, Mercer Island, WA 98040

| | | |
|-------------------------------------|--------|-------------|
| | | |
| Gross site area | 31,383 | sf (survey) |
| | 0.720 | acres |
| Land site area (on-shore), approx. | 24,500 | sf |
| | | |
| Proposed Impervious Area | | |
| Roof | 3,834 | sf |
| Proposed driveway, on-site, exposed | 4,753 | sf |
| Exposed back patio/stairs | 402 | sf |
| Exposed side stairs x 2 | 163 | sf |
| Exposed trash area | 104 | sf |
| total on-site new + replaced = | 9,255 | sf |
| existing impervious to remain = | 0 | sf |
| total impervious = | 9,255 | sf |

Figure I-2.4.1 Flow Chart for Determining Requirements for New Development



31,383 sf site area
9,255 sf new/replaced impervious
4,753 sf on-site PGIS total



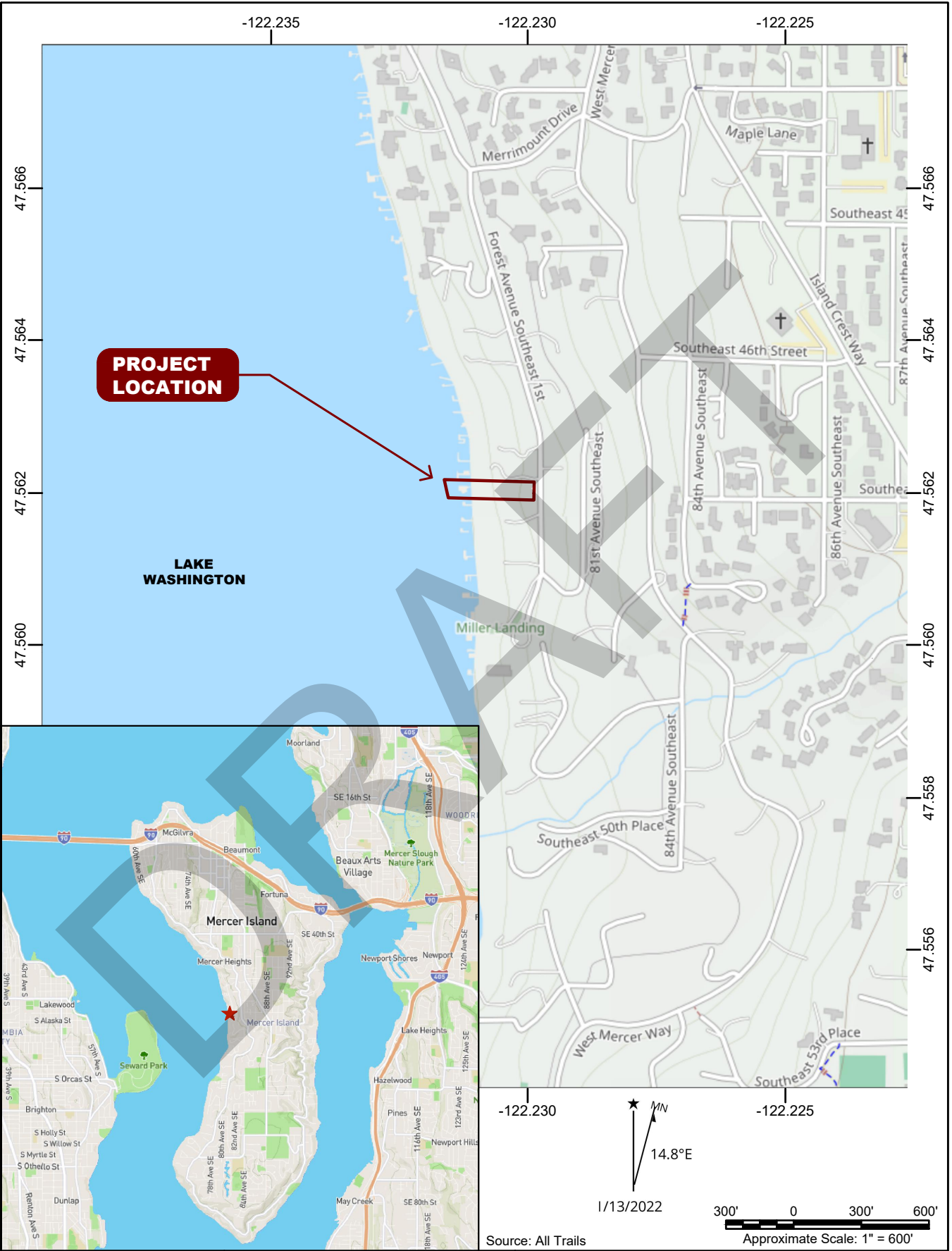
Figure I-2.4.1
Flow Chart for Determining Requirements for
New Development

Revised June 2015

Please see <http://www.ecy.wa.gov/copyright.html> for copyright notice including permissions, limitation of liability, and disclaimer.

4661 Forest Avenue SE
Mercer Island, WA 98040
CES #2033

DRAWN BY: NTW
 CHECKED BY: HMAX
 DATE: 2022.01.12
 Z:\Projects\2021 Projects\21-552 4661 Forest Ave SE, MI\Report + Figures\Figures



Zimmer Residence
 4661 Forest Avenue SE
 Mercer Island, Washington

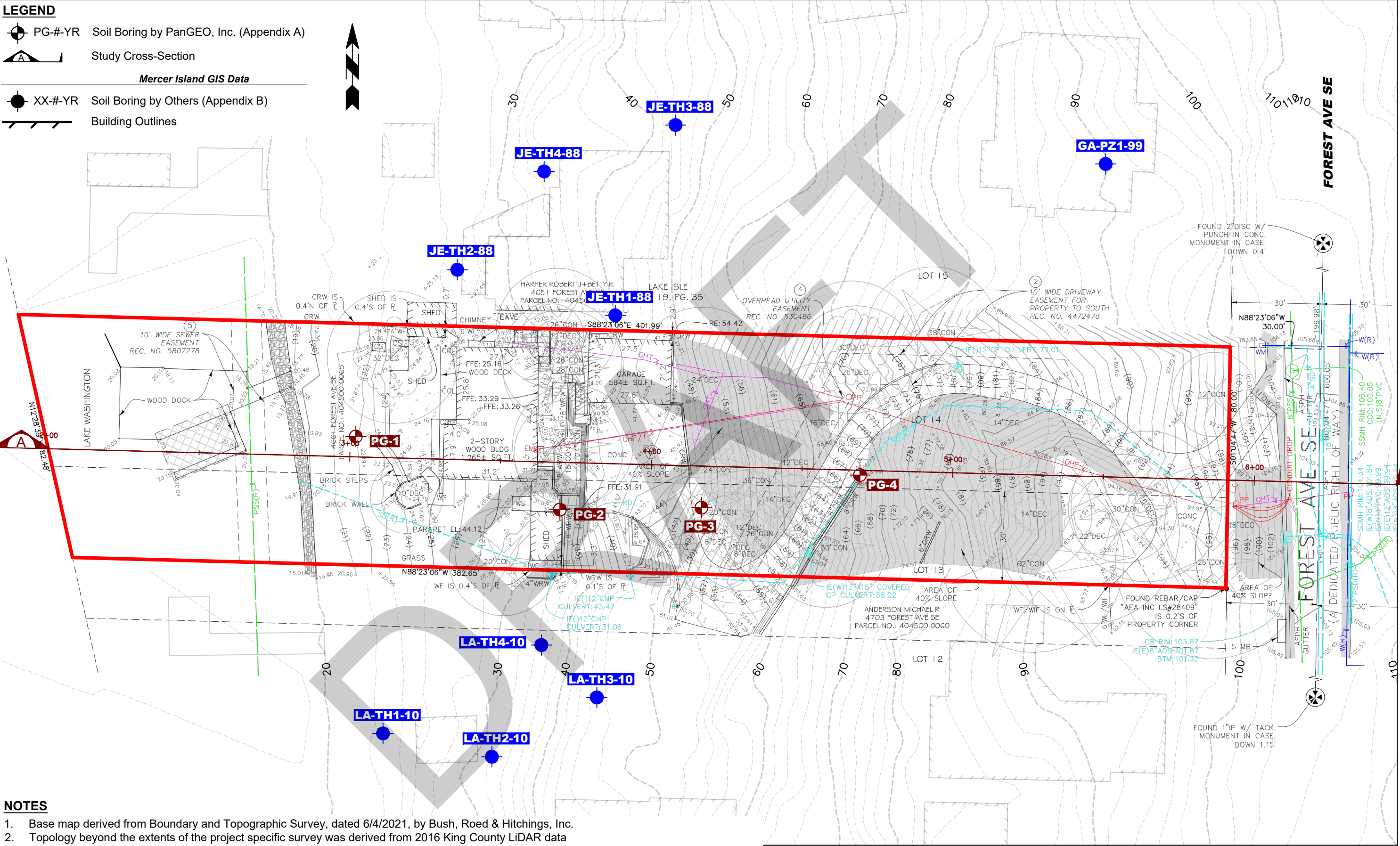
VICINITY MAP

| | | | |
|-------------|--------|------------|---|
| PROJECT NO. | 21-552 | FIGURE NO. | 1 |
|-------------|--------|------------|---|

LEGEND

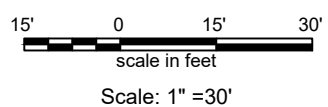
- PG-#-YR Soil Boring by PanGEO, Inc. (Appendix A)
- Study Cross-Section
- Mercer Island GIS Data**
- XX-#-YR Soil Boring by Others (Appendix B)
- Building Outlines

Z:\Projects\2021 Projects\21-552 4661 Forest Ave SE, MI\Report + Figures\Figures
 DATE: 2022.01.22
 CHECKED BY: HMX
 DRAWN BY: NTW



NOTES

1. Base map derived from Boundary and Topographic Survey, dated 6/4/2021, by Bush, Roed & Hitchings, Inc.
2. Topology beyond the extents of the project specific survey was derived from 2016 King County LiDAR data obtained from Washington DNR.
3. Additional features are based on GIS data obtained from Washington DNR and City of Mercer Island websites.
4. Supplemental Topology and features are provided for relative information only and are not a substitution for field survey.
5. Locations of subsurface explorations are approximate and based on the relative locations of known site features.
6. Vertical Datum: NAVD 88



| | | | |
|--|--|--|--|
| | Zimmer Residence 4661 Forest Avenue SE Mercer Island, Washington | SITE AND EXPLORATION PLAN TOPOGRAPHIC SURVEY | |
| | PROJECT NO. 21-552 | FIGURE NO. 2A | |

LEGEND

- PG-#-YR Soil Boring by PanGEO, Inc. (Appendix A)
- Study Cross-Section
- Mercer Island GIS Data*
- XX-#-YR Soil Boring by Others (Appendix B)
- Building Outlines

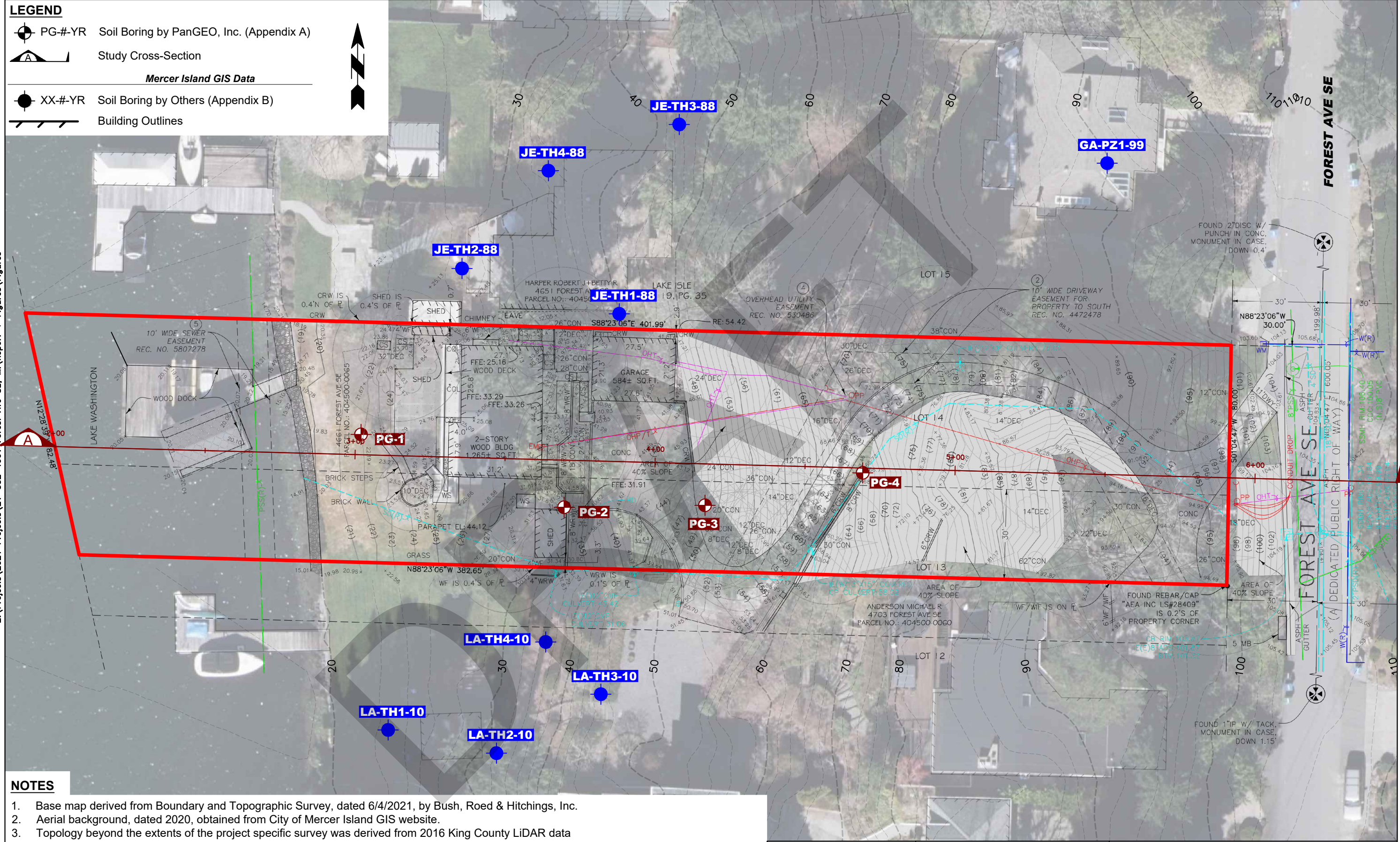


Z:\Projects\2021 Projects\21-552 4661 Forest Ave SE, MI\Report + Figures\Figures

DATE: 2022.01.22

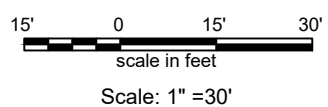
CHECKED BY: HMX

DRAWN BY: NTW



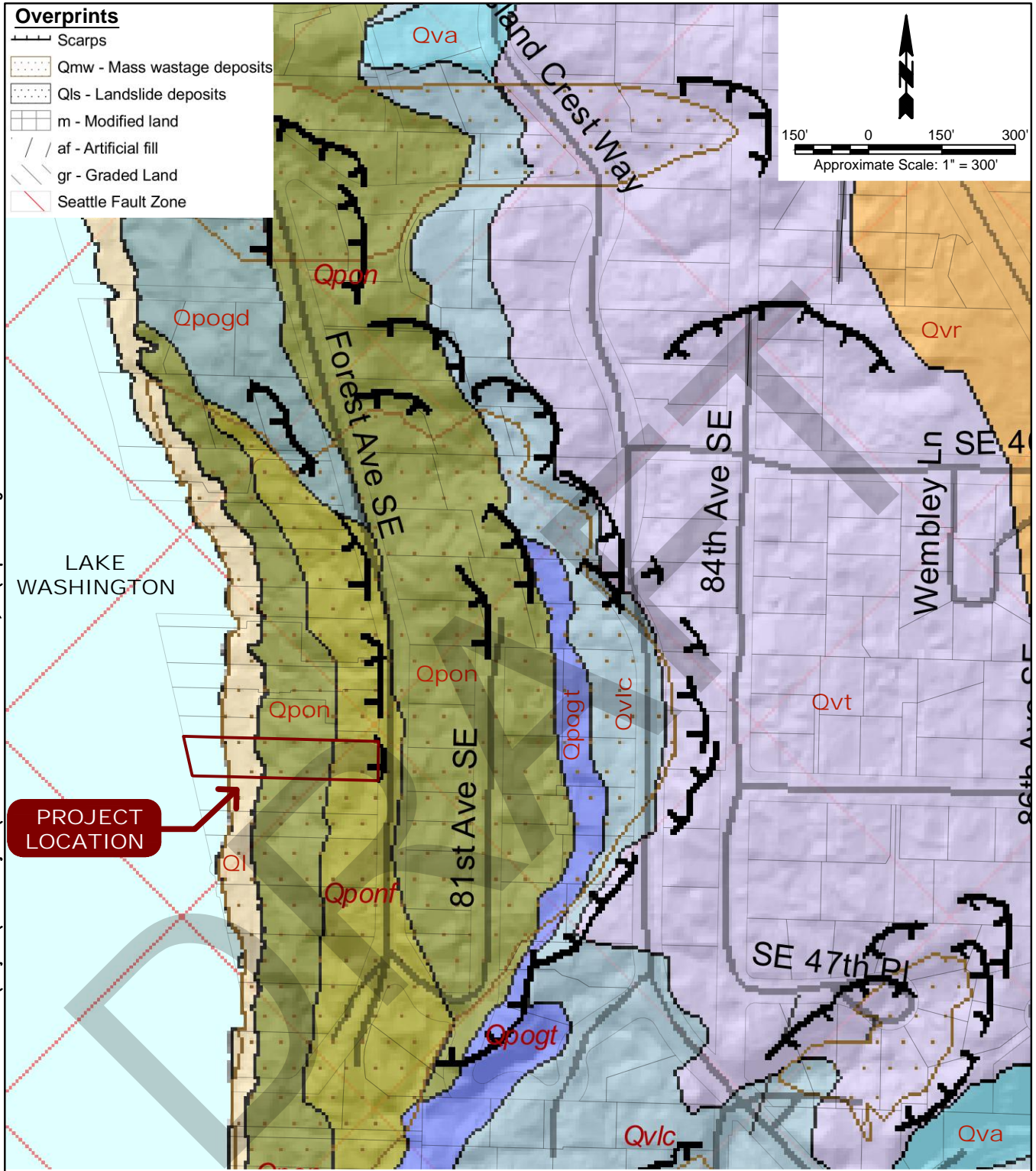
NOTES

1. Base map derived from Boundary and Topographic Survey, dated 6/4/2021, by Bush, Roed & Hitchings, Inc.
2. Aerial background, dated 2020, obtained from City of Mercer Island GIS website.
3. Topology beyond the extents of the project specific survey was derived from 2016 King County LiDAR data obtained from Washington DNR.
4. Additional features are based on GIS data obtained from Washington DNR and City of Mercer Island websites.
5. Supplemental Topology and features are provided for relative information only and are not a substitution for field survey.
6. Locations of subsurface explorations are approximate and based on the relative locations of known site features.
7. Vertical Datum: NAVD 88



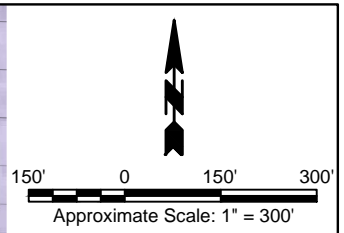
| | | | |
|--|--|---|--|
| | Zimmer Residence 4661 Forest Avenue SE Mercer Island, Washington | SITE AND EXPLORATION PLAN AERIAL IMAGERY | |
| | PROJECT NO. 21-552 | FIGURE NO. 2B | |

DRAWN BY: NTW
 CHECKED BY: HMX
 DATE: 2022.01.22
 Z:\Projects\2021 Projects\21-552 4661 Forest Ave SE, M\Report + Figures



Overprints

- Scarps
- Qmw - Mass wastage deposits
- Qls - Landslide deposits
- m - Modified land
- af - Artificial fill
- gr - Graded Land
- Seattle Fault Zone



GEOLOGIC UNITS

- Ql Lake deposits
- Qvr Vashon recessional outwash deposits
- Qvt Vashon glacial till
- Qva Vashon advance outwash deposits
- Qvlc Lawton clay
- Qpogt Pre-Olympia glacial till
- Qpogd Pre-Olympia glacial diamict
- Qpon Pre-Olympia nonglacial deposits
- Qponf Pre-Olympia fine-grained nonglacial deposits.

NOTES

1. Derived from the Geologic Map of Mercer Island, Washington (Troost and Wisner, 2006)
2. Detailed descriptions of the geologic units can be found in the text of the report.
3. Only the applicable geologic units are listed.



Zimmer Residence
 4661 Forest Avenue SE
 Mercer Island, Washington

GEOLOGIC MAP

| | |
|-----------------------|-----------------|
| PROJECT NO. 21-552 | FIGURE NO. 3 |
|-----------------------|-----------------|

LEGEND

- PG-#-YR Soil Boring by PanGEO, Inc. (Appendix A)
- XX-#-YR Soil Boring by Others (Appendix B)
- XX-#-YR Test Pits by Others (Appendix B)
- Study Cross-Section



Mercer Island GIS Data

- Mapped ECA Steep Slope (>40%)
- Mapped ECA Potential Slide Areas
- Mapped ECA Erosion Area
- Mapped ECA Seismic Areas
- Mapped Scarp
- Mapped ECA Known Slides

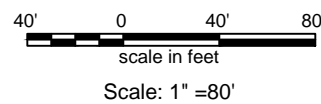
Z:\2021 Projects\21-552 4661 Forest Ave SE, MI\Report + Figures\Figures

CHECKED BY: HMX DATE: 2022.01.22

DRAWN BY: NTW

NOTES

1. Base map and features are based on 2016 King County Lidar and GIS data obtained from Washington DNR and City of Mercer Island websites. Features are provided for relative information only and are not a substitution for field survey.
2. Locations of borings are approximate and based on the relative locations of known site features.
3. Vertical Datum: NAVD 88

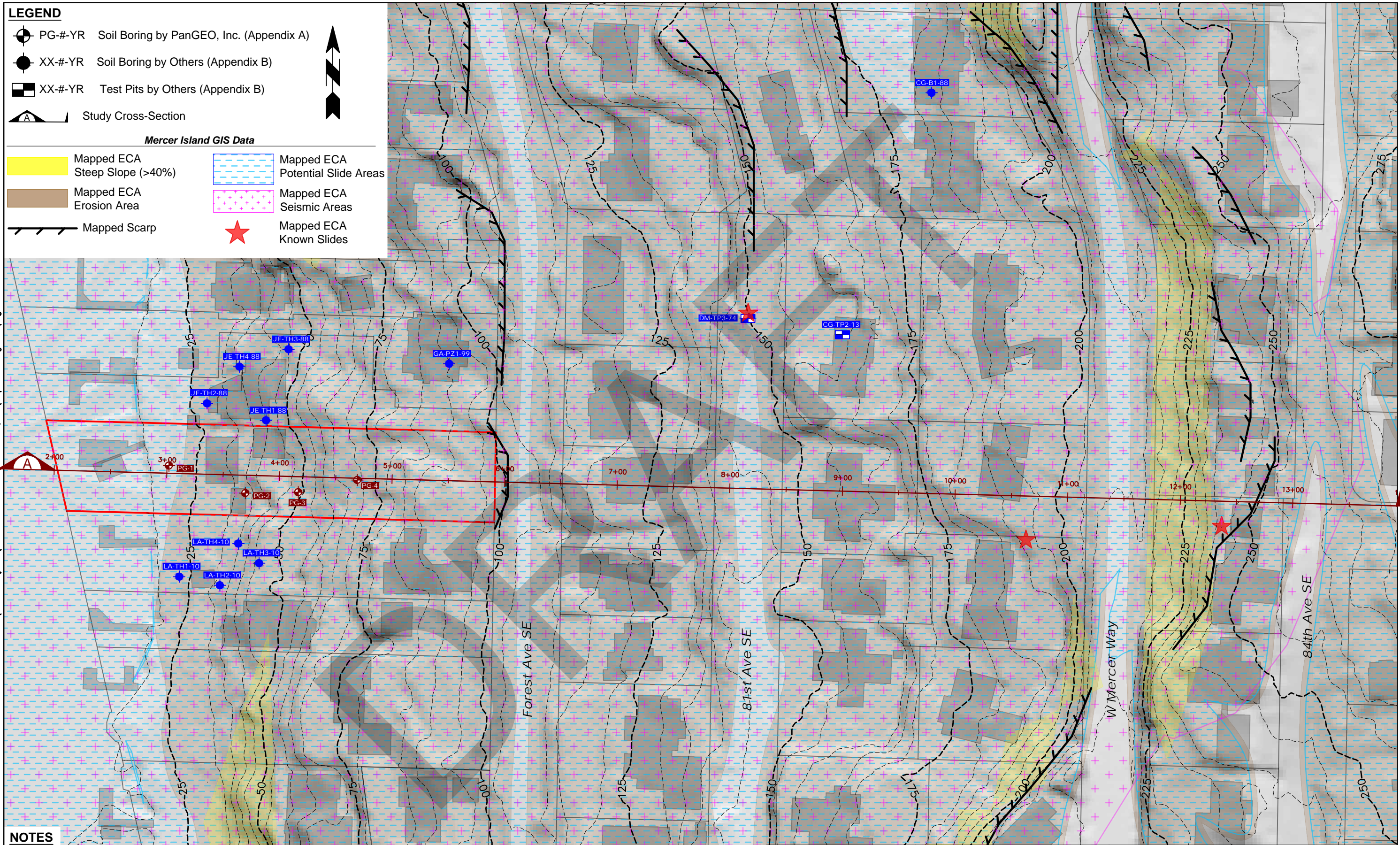


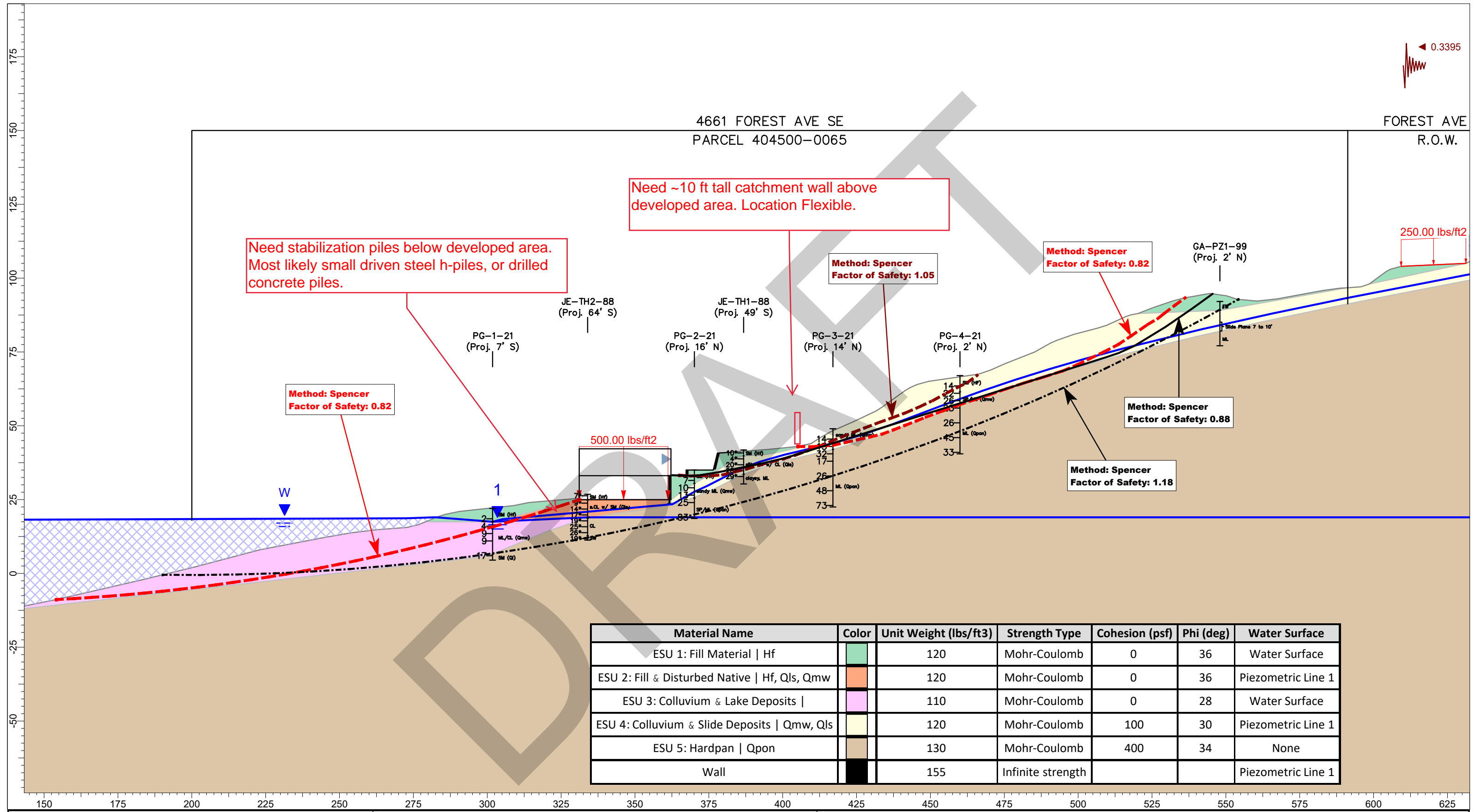
Zimmer Residence
4661 Forest Avenue SE
Mercer Island, Washington

LIDAR AND CRITICAL AREAS

PROJECT NO.
21-552

FIGURE NO.
4





Zimmer Residence
4661 Forest Avenue SE
Mercer Island, WA

Pseudo-static (Seismic) Global Stability Analysis

Section A | Existing Condition

| | | |
|--------|-------------|------------|
| Scale: | Project No. | Figure No. |
| 1:360 | 21-552 | X |

RELATIVE DENSITY / CONSISTENCY

| SAND / GRAVEL | | | SILT / CLAY | | |
|---------------|--------------|------------------------------|-------------|--------------|--|
| Density | SPT N-values | Approx. Relative Density (%) | Consistency | SPT N-values | Approx. Undrained Shear Strength (psf) |
| Very Loose | <4 | <15 | Very Soft | <2 | <250 |
| Loose | 4 to 10 | 15 - 35 | Soft | 2 to 4 | 250 - 500 |
| Med. Dense | 10 to 30 | 35 - 65 | Med. Stiff | 4 to 8 | 500 - 1000 |
| Dense | 30 to 50 | 65 - 85 | Stiff | 8 to 15 | 1000 - 2000 |
| Very Dense | >50 | 85 - 100 | Very Stiff | 15 to 30 | 2000 - 4000 |
| | | | Hard | >30 | >4000 |

UNIFIED SOIL CLASSIFICATION SYSTEM

| MAJOR DIVISIONS | | GROUP DESCRIPTIONS | |
|--|---------------------|--------------------|--------------------------|
| Gravel 50% or more of the coarse fraction retained on the #4 sieve. Use dual symbols (eg. GP-GM) for 5% to 12% fines. | GRAVEL (<5% fines) | | GW: Well-graded GRAVEL |
| | GRAVEL (>12% fines) | | GP: Poorly-graded GRAVEL |
| | | | GM: Silty GRAVEL |
| Sand 50% or more of the coarse fraction passing the #4 sieve. Use dual symbols (eg. SP-SM) for 5% to 12% fines. | | | GC: Clayey GRAVEL |
| | SAND (<5% fines) | | SW: Well-graded SAND |
| | SAND (>12% fines) | | SP: Poorly-graded SAND |
| | | | SM: Silty SAND |
| | | | SC: Clayey SAND |
| Silt and Clay 50% or more passing #200 sieve | Liquid Limit < 50 | | ML: SILT |
| | | | CL: Lean CLAY |
| | | | OL: Organic SILT or CLAY |
| | | | MH: Elastic SILT |
| | | | CH: Fat CLAY |
| | Liquid Limit > 50 | | OH: Organic SILT or CLAY |
| | | | PT: PEAT |
| Highly Organic Soils | | | |

TEST SYMBOLS

for In Situ and Laboratory Tests listed in "Other Tests" column.

- ATT Atterberg Limit Test
- Comp Compaction Tests
- Con Consolidation
- DD Dry Density
- DS Direct Shear
- %F Fines Content
- GS Grain Size
- Perm Permeability
- PP Pocket Penetrometer
- R R-value
- SG Specific Gravity
- TV Torvane
- TXC Triaxial Compression
- UCC Unconfined Compression

SYMBOLS

Sample/In Situ test types and intervals

- 2-inch OD Split Spoon, SPT (140-lb. hammer, 30" drop)
- 3.25-inch OD Split Spoon (300-lb hammer, 30" drop)
- Non-standard penetration test (see boring log for details)
- Thin wall (Shelby) tube
- Grab
- Rock core
- Vane Shear

- Notes:**
- Soil exploration logs contain material descriptions based on visual observation and field tests using a system modified from the Uniform Soil Classification System (USCS). Where necessary laboratory tests have been conducted (as noted in the "Other Tests" column), unit descriptions may include a classification. Please refer to the discussions in the report text for a more complete description of the subsurface conditions.
 - The graphic symbols given above are not inclusive of all symbols that may appear on the borehole logs. Other symbols may be used where field observations indicated mixed soil constituents or dual constituent materials.

DESCRIPTIONS OF SOIL STRUCTURES

| | |
|---|---|
| Layered: Units of material distinguished by color and/or composition from material units above and below | Fissured: Breaks along defined planes |
| Laminated: Layers of soil typically 0.05 to 1mm thick, max. 1 cm | Slickensided: Fracture planes that are polished or glossy |
| Lens: Layer of soil that pinches out laterally | Blocky: Angular soil lumps that resist breakdown |
| Interlayered: Alternating layers of differing soil material | Disrupted: Soil that is broken and mixed |
| Pocket: Erratic, discontinuous deposit of limited extent | Scattered: Less than one per foot |
| Homogeneous: Soil with uniform color and composition throughout | Numerous: More than one per foot |
| | BCN: Angle between bedding plane and a plane normal to core axis |

COMPONENT DEFINITIONS

| COMPONENT | SIZE / SIEVE RANGE | COMPONENT | SIZE / SIEVE RANGE |
|----------------|------------------------|--------------|--------------------------------------|
| Boulder: | > 12 inches | Sand | |
| Cobbles: | 3 to 12 inches | Coarse Sand: | #4 to #10 sieve (4.5 to 2.0 mm) |
| Gravel | | Medium Sand: | #10 to #40 sieve (2.0 to 0.42 mm) |
| Coarse Gravel: | 3 to 3/4 inches | Fine Sand: | #40 to #200 sieve (0.42 to 0.074 mm) |
| Fine Gravel: | 3/4 inches to #4 sieve | Silt | 0.074 to 0.002 mm |
| | | Clay | <0.002 mm |

MONITORING WELL

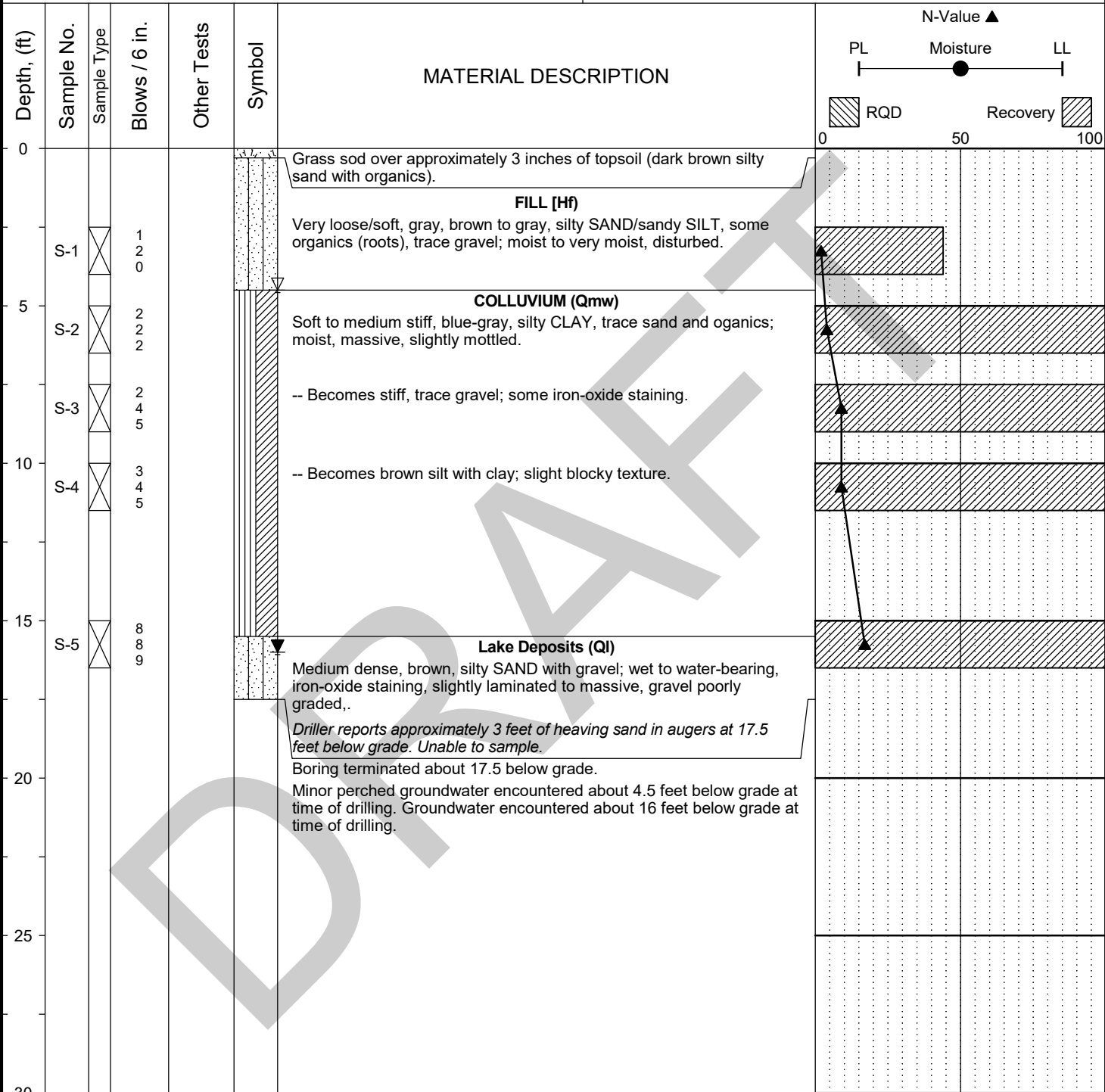
- Groundwater Level at time of drilling (ATD)
- Static Groundwater Level
- Cement / Concrete Seal
- Bentonite grout / seal
- Silica sand backfill
- Slotted tip
- Slough
- Bottom of Boring

MOISTURE CONTENT

| | |
|-------|---------------------------|
| Dry | Dusty, dry to the touch |
| Moist | Damp but no visible water |
| Wet | Visible free water |

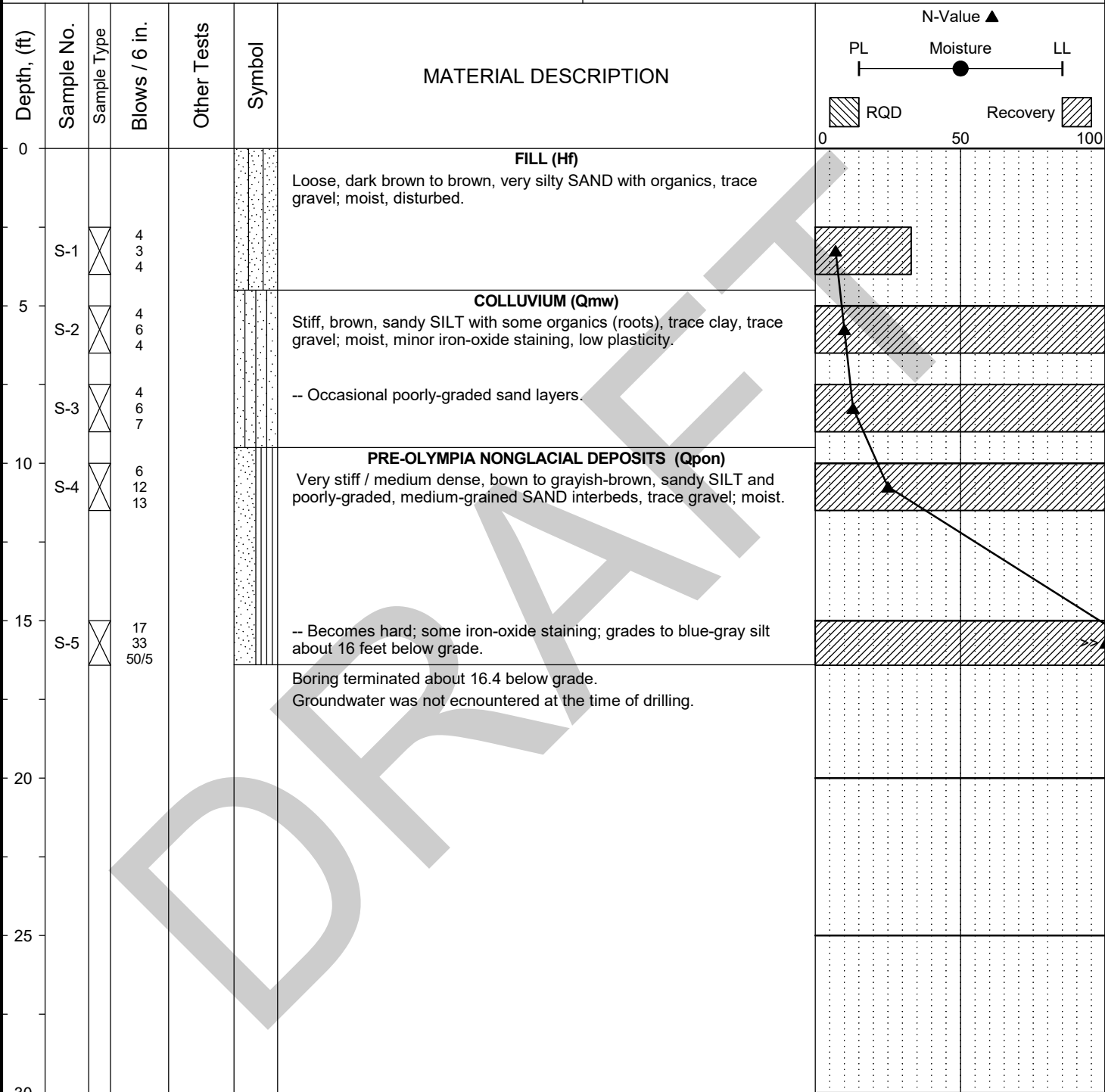
LOG KEY 16-056 LOGS.GPJ PANGEO.GDT 02/22/16

| | | | |
|--------------|---|----------------------|--------|
| Project: | Zimmer Residence | Surface Elevation: | ~22 ft |
| Job Number: | 21-552 | Top of Casing Elev.: | n/a |
| Location: | 4661 Forest Ave SE, Mercer Island, WA | Drilling Method: | HSA |
| Coordinates: | Northing: 47.56205, Easting: -122.23109 | Sampling Method: | SPT |



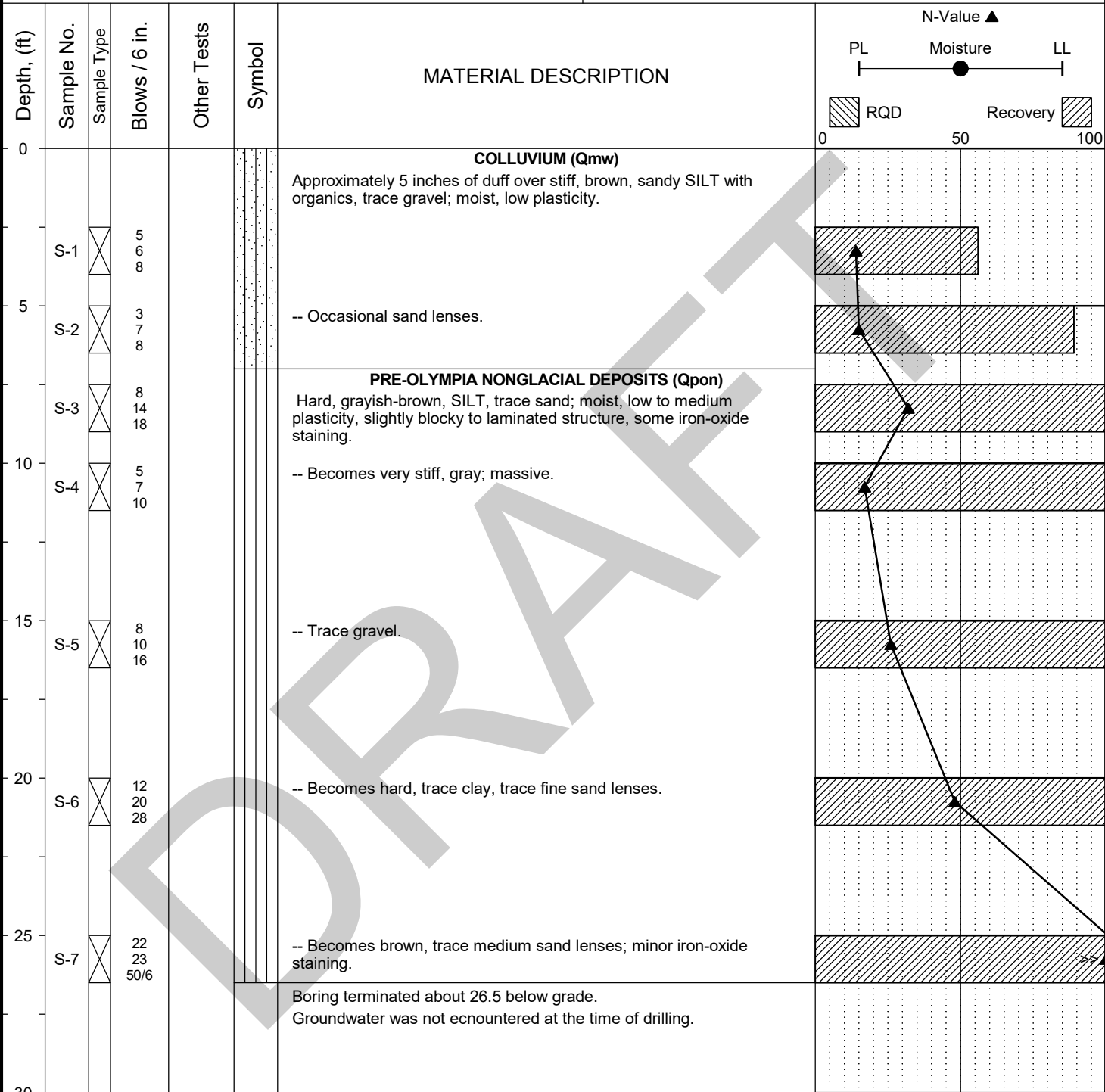
| | | |
|--------------------------|-------------------------|--|
| Completion Depth: | 17.5ft | Remarks: Hand-portable Acker drill rig used. Standard Penetration Test (SPT) sampler driven with a 140 lb. safety hammer. Hammer operated with a rope and cathead mechanism. This surface elevation is estimated from topographic survey prepared by Bush, Roed & Hitchings, Inc., dated June 4, 2021. Vertical datum: NAVD 88. |
| Date Borehole Started: | 12/15/21 | |
| Date Borehole Completed: | 12/15/21 | |
| Logged By: | S. Harrington | |
| Drilling Company: | Geologic Drill Partners | |

| | | | |
|--------------|--|----------------------|--------|
| Project: | Zimmer Residence | Surface Elevation: | ~35 ft |
| Job Number: | 21-552 | Top of Casing Elev.: | n/a |
| Location: | 4661 Forest Ave SE, Mercer Island, WA | Drilling Method: | HSA |
| Coordinates: | Northing: 47.56201, Easting: -122.2308 | Sampling Method: | SPT |



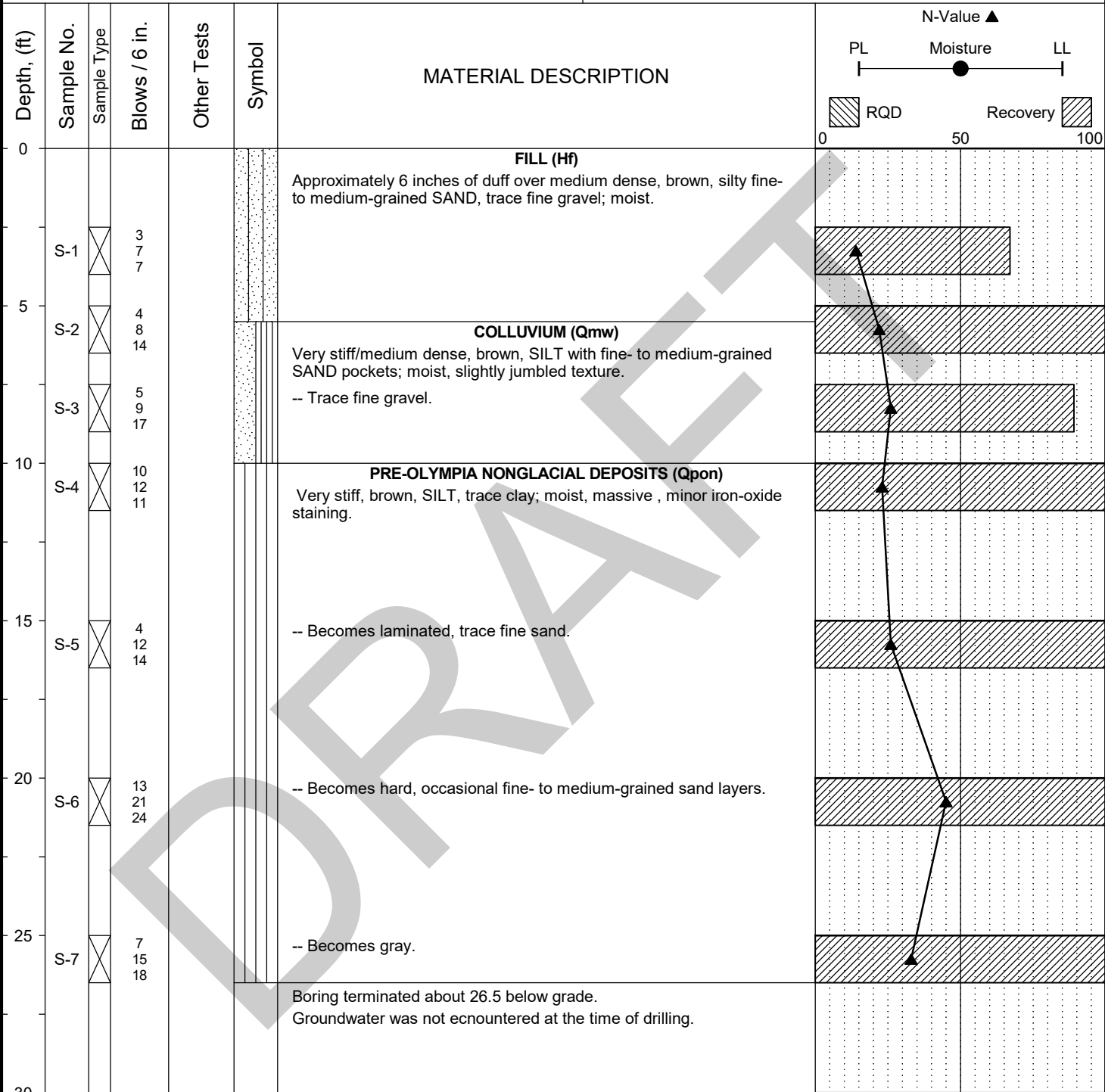
| | | |
|--------------------------|-------------------------|--|
| Completion Depth: | 16.4ft | Remarks: Hand-portable Acker drill rig used. Standard Penetration Test (SPT) sampler driven with a 140 lb. safety hammer. Hammer operated with a rope and cathead mechanism. This surface elevation is estimated from topographic survey prepared by Bush, Roed & Hitchings, Inc., dated June 4, 2021. Vertical datum: NAVD 88. |
| Date Borehole Started: | 12/15/21 | |
| Date Borehole Completed: | 12/15/21 | |
| Logged By: | S. Harrington | |
| Drilling Company: | Geologic Drill Partners | |

| | | | |
|--------------|---|----------------------|--------|
| Project: | Zimmer Residence | Surface Elevation: | ~49 ft |
| Job Number: | 21-552 | Top of Casing Elev.: | n/a |
| Location: | 4661 Forest Ave SE, Mercer Island, WA | Drilling Method: | HSA |
| Coordinates: | Northing: 47.56196, Easting: -122.23067 | Sampling Method: | SPT |



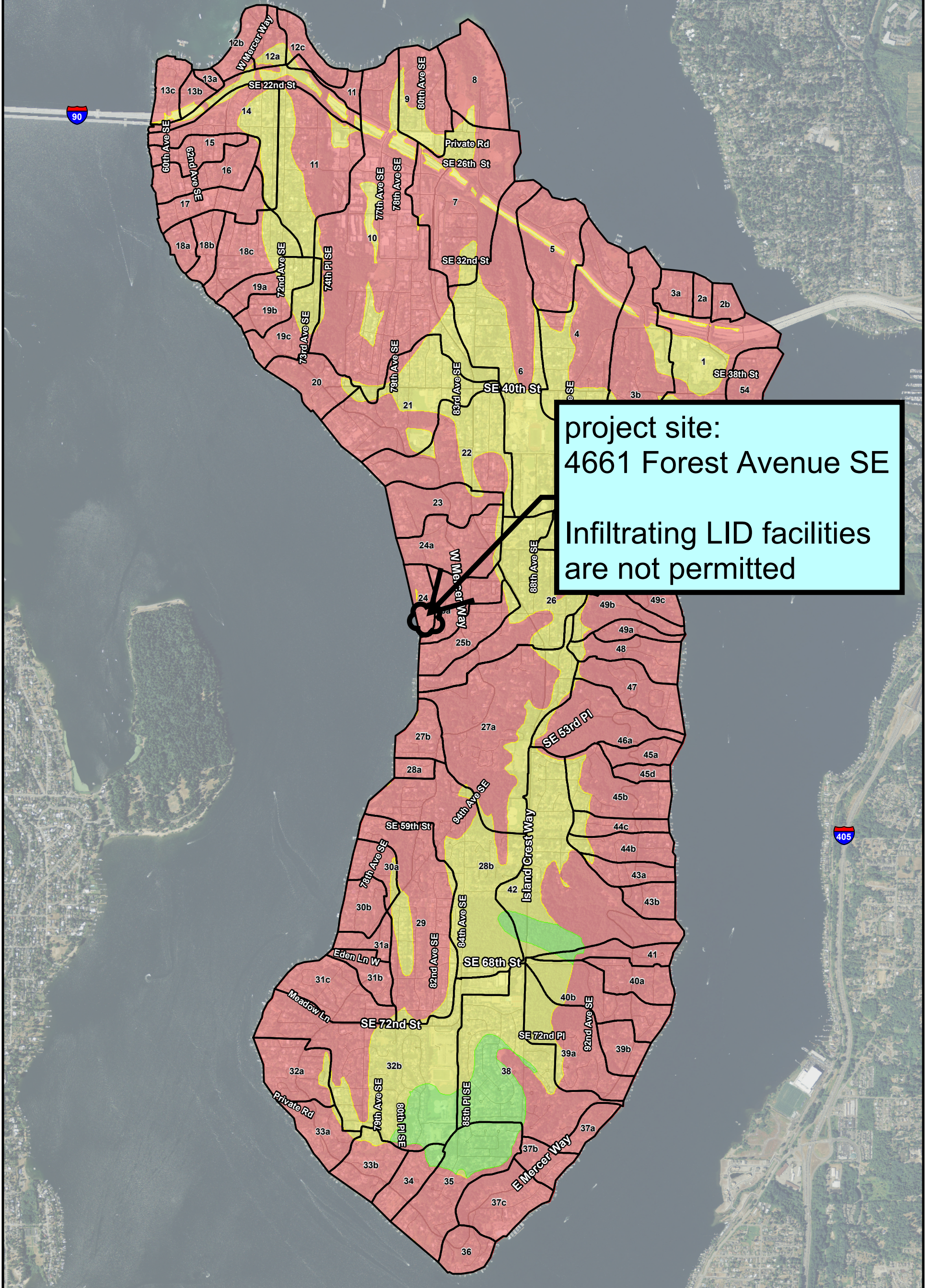
| | | |
|--------------------------|-------------------------|--|
| Completion Depth: | 26.5ft | Remarks: CAT-mounted track drill rig used. Standard Penetration Test (SPT) sampler driven with a 140 lb. safety hammer. Hammer operated with a rope and cathead mechanism. This surface elevation is estimated from topographic survey prepared by Bush, Roed & Hitchings, Inc., dated June 4, 2021. Vertical datum: NAVD 88. |
| Date Borehole Started: | 12/15/21 | |
| Date Borehole Completed: | 12/15/21 | |
| Logged By: | S. Harrington | |
| Drilling Company: | Geologic Drill Partners | |

| | | | |
|--------------|---|----------------------|--------|
| Project: | Zimmer Residence | Surface Elevation: | ~67 ft |
| Job Number: | 21-552 | Top of Casing Elev.: | n/a |
| Location: | 4661 Forest Ave SE, Mercer Island, WA | Drilling Method: | HSA |
| Coordinates: | Northing: 47.56203, Easting: -122.23053 | Sampling Method: | SPT |



| | | | |
|--------------------------|-------------------------|----------|---|
| Completion Depth: | 26.5ft | Remarks: | CAT-mounted track drill rig used. Standard Penetration Test (SPT) sampler driven with a 140 lb. safety hammer. Hammer operated with a rope and cathead mechanism. This surface elevation is estimated from topographic survey prepared by Bush, Roed & Hitchings, Inc., dated June 4, 2021. Vertical datum: NAVD 88. |
| Date Borehole Started: | 12/15/21 | | |
| Date Borehole Completed: | 12/15/21 | | |
| Logged By: | S. Harrington | | |
| Drilling Company: | Geologic Drill Partners | | |

Low impact development infiltration feasibility on Mercer Island map (infiltration feasibility map)



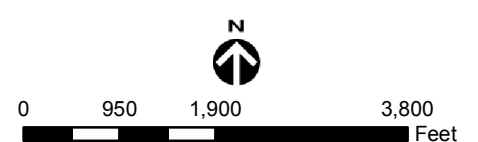
project site:
4661 Forest Avenue SE
Infiltrating LID facilities
are not permitted

Legend

- Infiltrating LID facilities may be feasible, and soil has high infiltration potential
- Infiltrating LID facilities may be feasible, and soil has moderate infiltration potential
- Infiltrating LID facilities are not permitted
- Storm drainage basin

* Map is intended to be used for planning purposes only. Site-specific analysis is required prior to design and construction of LID facilities.

Figure 3. Low impact development infiltration feasibility on Mercer Island.



Aerial photography: USDA (2009)
K:\Projects\10-04816-000\Project\lid_feasibility-report-11x17.mxd



CITY OF MERCER ISLAND

SECTION B: SMALL PROJECT CONSTRUCTION SWPPP NARRATIVE

Instructions

This is a template for a simplified Construction Stormwater Pollution Prevention Plan ("Construction SWPPP"). If "No" is the answer to one or more of the statements on the first page of Section A of this submittal package, then a full Construction SWPPP is required and the project does not qualify for the use of the Small Project Construction SWPPP Narrative template. If the project is less than the thresholds on the first page of Section A of this submittal package, then Minimum Requirement #2 still applies, but this section (Section B) or a full construction SWPPP is not required. You should include your Construction SWPPP in your contract with your builder. A copy of the Construction SWPPP must be located at the construction site or within reasonable access to the site for construction and inspection personnel at all times.

General Information on the Existing Site and Project

Describe the following in the Project Narrative box below (attach additional pages if necessary):

- Nature and purpose of the construction project
- Existing topography, vegetation, and drainage, and building structures
- Adjacent areas, including streams, lakes, wetlands, residential areas, and roads that might be affected by the construction project
- How upstream drainage areas may affect the site
- Downstream drainage leading from the site to the receiving body of water
- Areas on or adjacent to the site that are classified as critical areas
- Critical areas that receive runoff from the site up to one-quarter mile away
- Special requirements and provisions for working near or within critical areas
- Areas on the site that have potential erosion problems

Project Narrative:



CITY OF MERCER ISLAND

SECTION B: SMALL PROJECT CONSTRUCTION SWPPP NARRATIVE

Construction SWPPP Drawings

Refer to the general Drawing Requirements in Stormwater Management Manual for Western Washington (SWMMWW) Volume I, Chapter 3.

Vicinity Map

Provide a map with enough detail to identify the location of the construction site, adjacent roads, and receiving waters.

Site Map

Include the following (where applicable):

- | | |
|---|---|
| <input type="checkbox"/> Legal description of the property boundaries or an illustration of property lines (including distances) on the drawings. see C2.0 Drainage Plan | <input type="checkbox"/> Final and interim grade contours as appropriate, drainage basins, and the direction of stormwater flow during and upon completion of construction. |
| <input type="checkbox"/> North arrow. | <input type="checkbox"/> Areas of soil disturbance, including all areas affected by clearing, grading, and excavation. |
| <input type="checkbox"/> Existing structures and roads. | <input type="checkbox"/> Locations where stormwater will discharge to surface waters during and upon completion of construction. |
| <input type="checkbox"/> Boundaries and identification of different soil types. | <input type="checkbox"/> Existing unique or valuable vegetation and vegetation to be preserved. |
| <input type="checkbox"/> Areas of potential erosion problems. | <input type="checkbox"/> Cut-and-fill slopes indicating top and bottom of slope catch lines. |
| <input type="checkbox"/> Any on-site and adjacent surface waters, critical areas, buffers, flood plain boundaries, and Shoreline Management boundaries. | <input type="checkbox"/> Total cut-and-fill quantities and the method of disposal for excess material. |
| <input type="checkbox"/> Existing contours and drainage basins and the direction of flow for the different drainage areas. | <input type="checkbox"/> Stockpile; waste storage; and vehicle storage, maintenance, and washdown areas. |
| <input type="checkbox"/> Where feasible, contours extend a minimum of 25 feet beyond property lines and extend sufficiently to depict existing conditions. | |

Temporary and Permanent BMPs

Include the following on site map (where applicable):

- | | |
|---|--|
| <input type="checkbox"/> Locations for temporary and permanent swales, interceptor trenches, or ditches. | <input type="checkbox"/> Details for bypassing off-site runoff around disturbed areas. |
| <input type="checkbox"/> Drainage pipes, ditches, or cut-off trenches associated with erosion and sediment control and stormwater management. | <input type="checkbox"/> Locations of temporary and permanent stormwater treatment and/or flow control best management practices (BMPs). |
| <input type="checkbox"/> Temporary and permanent pipe inverts and minimum slopes and cover. | <input type="checkbox"/> Details for all structural and nonstructural erosion and sediment control (ESC) BMPs (including, but not limited to, silt fences, construction entrances, sedimentation facilities, etc.) |
| <input type="checkbox"/> Grades, dimensions, and direction of flow in all ditches and swales, culverts, and pipes. | <input type="checkbox"/> Details for any construction-phase BMPs or techniques used for Low Impact Development (LID) BMP protection. |
| <input type="checkbox"/> Locations and outlets of any dewatering systems. | |



CITY OF MERCER ISLAND

SECTION B: SMALL PROJECT CONSTRUCTION SWPPP NARRATIVE

Element 1: Preserve Vegetation / Mark Clearing Limits

The goal of this element is to preserve native vegetation and to clearly show the limits of disturbance.

This element **does not** apply to my project because:

The site was cleared as part of clearing activity that is subject to an enforcement action and is re-vegetated. Restoration may be necessary to comply with Critical Area Regulations or NPDES requirements. Buffer Zones-BMP C102 may apply if Critical Areas exist on-site and buffer zones shall be protected.

Other Reason / Additional Comments:

If it **does** apply, describe the steps you will take and select the best management practices (BMPs) you will use:

The perimeter of the area to be cleared shall be marked prior to clearing operation with visible flagging, orange plastic barrier fencing and/or orange silt fencing as shown on the SWPPP site map. The total disturbed area shall be less than 7,000 square feet. Vehicles will only be allowed in the areas to be graded, so no compaction of the undeveloped areas will occur.

Additional Comments:

Check the BMPs you will use:

C101 Preserving Natural Vegetation

C102 Buffer Zones

C103 High Visibility Fence



CITY OF MERCER ISLAND

SECTION B: SMALL PROJECT CONSTRUCTION SWPPP NARRATIVE

Element 2: Construction Access

The goal of this element is to provide a stabilized construction entrance/exit to prevent or reduce or sediment track out.

This element **does not** apply to my project because:

The driveway to the construction area already exists and will be used for construction access. All equipment and vehicles will be restricted to staying on that existing impervious surface.

Other Reason / Additional Comments:

If it **does** apply, describe the steps you will take and select the BMPs you will use:

A stabilized construction entrance will be installed prior to any vehicles entering the site, at the location shown on the SWPPP site map.

Additional Comments:

Check the BMPs you will use:

C105 Stabilized Construction Entrance / Exit

C106 Wheel Wash

C107 Construction Road / Parking Area Stabilization



CITY OF MERCER ISLAND

SECTION B: SMALL PROJECT CONSTRUCTION SWPPP NARRATIVE

Element 3: Control Flow Rates

The goal of this element is to construct retention or detention facilities when necessary to protect properties and waterways downstream of development sites from erosion and turbid discharges.

This element **does not** apply to my project because:

Other Reason / Additional Comments:

If it **does** apply, describe the steps you will take and select the BMPs you will use:

Flow rates will be controlled by using SWPPP Element 4 sediment controls and BMP T5.13 Post-Construction Soil Quality and Depth if necessary.

Additional Comments:



CITY OF MERCER ISLAND

SECTION B: SMALL PROJECT CONSTRUCTION SWPPP NARRATIVE

Element 4: Sediment Control

The goal of this element is to construct sediment control BMPs that minimize sediment discharges from the site.

This element **does not** apply to my project because:

The site has already been stabilized and re-vegetated.

Other Reason / Additional Comments:

If it **does** apply, describe the steps you will take and select the BMPs you will use:

Sediment control BMPs shall be placed at the locations shown on the SWPPP site map

Additional Comments:

Check the BMPs you will use:

C231 Brush Barrier

C233 Silt Fence

C235 Wattles

C232 Gravel Filter Berm

C234 Vegetated Strip



CITY OF MERCER ISLAND

SECTION B: SMALL PROJECT CONSTRUCTION SWPPP NARRATIVE

Element 5: Stabilize Soils

The goal of this element is to stabilize exposed and unworked soils by implementing erosion control BMPs.

This element **does not** apply to my project because:

Other Reason / Additional Comments:

If it **does** apply, describe the steps you will take and select the BMPs you will use:

Exposed soils shall be worked during the week until they have been stabilized. Soil stockpiles will be located within the disturbed area shown on the SWPPP site map. Soil excavated for the foundation will be backfilled against the foundation and graded to drain away from the building. No soils shall remain exposed and unworked for more than 7 days from May 1 to September 30 or more than 2 days from October 1 to April 30. Once the disturbed landscape areas are graded, the grass areas will be amended using BMP T5.13 Post-Construction Soil Quality and Depth. All stockpiles will be covered with plastic or burlap if left unworked.

Additional Comments:

Check the BMPs you will use:

- C120 Temporary & Permanent Seeding
- C122 Nets & Blankets
- C124 Sodding
- C131 Gradient Terraces
- C235 Wattles
- C121 Mulching
- C123 Plastic Covering
- C125 Topsoil / Composting
- C140 Dust Control



CITY OF MERCER ISLAND

SECTION B: SMALL PROJECT CONSTRUCTION SWPPP NARRATIVE

Element 6: Protect Slopes

The goal of this element is to design and construct cut-and-fill slopes in a manner to minimize erosion.

This element **does not** apply to my project because:

No cut slopes over 4 feet high or slopes steeper than 2 feet horizontal to 1 foot vertical, and no fill slopes over 4 feet high will exceed 3 feet horizontal to 1 foot vertical. Therefore, there is no requirement for additional engineered slope protection.

Other Reason / Additional Comments:

If it **does** apply, describe the steps you will take and select the BMPs you will use:

Additional Comments:

Check the BMPs you will use:

- | | | |
|---|---|---|
| <input type="checkbox"/> C120 Temporary & Permanent Seeding | <input type="checkbox"/> C205 Subsurface Drains | <input type="checkbox"/> C207 Check Dams |
| <input type="checkbox"/> C204 Pipe Slope Drains | <input type="checkbox"/> C206 Level Spreader | <input type="checkbox"/> C208 Triangular Silt Dike (Geotextile-Encased Check Dam) |



CITY OF MERCER ISLAND

SECTION B: SMALL PROJECT CONSTRUCTION SWPPP NARRATIVE

Element 7: Protect Permanent Drain Inlets

The goal of this element is to protect storm drain inlets during construction to prevent stormwater runoff from entering the conveyance system without being filtered or treated.

This element **does not** apply to my project because:

- The site has open ditches in the right-of-way or private road right-of-way.
- There are no catch basins on or near the site.
- Other Reason / Additional Comments:

If it **does** apply, describe the steps you will take and select the BMPs you will use:

- Catch basins on the site or immediately off site in the right-of-way are shown on the SWPPP site map. Storm drain inlet protection shall be installed.

Additional Comments:

Check the BMPs you will use:

- C220 Storm Drain Inlet Protection



CITY OF MERCER ISLAND

SECTION B: SMALL PROJECT CONSTRUCTION SWPPP NARRATIVE

Element 8: Stabilize Channels and Outlets

The goal of this element is to design, construct, and stabilize on-site conveyance channels to prevent erosion from entering existing stormwater outfalls and conveyance systems.

This element **does not** apply to my project because:

Construction will occur during the dry weather. No storm drainage channels or ditches shall be constructed either temporary or permanent. A small swale shall be graded to convey yard drainage around the structure using a shallow slope; it shall be seeded after grading and stabilized.

Other Reason / Additional Comments:

If it **does** apply, describe the steps you will take and select the BMPs you will use:

A wattle shall be placed at the end of the swale to prevent erosion at the outlet of the swale.

Additional Comments:

Check the BMPs you will use:

C202 Channel Lining C207 Check Dams C209 Outlet Protection C235 Wattles



CITY OF MERCER ISLAND

SECTION B: SMALL PROJECT CONSTRUCTION SWPPP NARRATIVE

Element 9: Control Pollutants

The goal of this element is to design, install, implement and maintain BMPs to minimize the discharge of pollutants from material storage areas, fuel handling, equipment cleaning, management of waste materials, etc.

This element **does not** apply to my project because:

Other Reason / Additional Comments:

If it **does** apply, describe the steps you will take and select the BMPs you will use:

Any and all pollutants, chemicals, liquid products and other materials that have the potential to pose a threat to human health or the environment will be covered, contained, and protected from vandalism. All such products shall be kept under cover in a secure location on-site. Concrete handling shall follow BMP C151.

Additional Comments:

Check the BMPs you will use:

C151 Concrete Handling

C152 Sawcutting and Surfacing Pollution Prevention

C153 Material Delivery, Storage, and Containment

C154 Concrete Washout Area



CITY OF MERCER ISLAND

SECTION B: SMALL PROJECT CONSTRUCTION SWPPP NARRATIVE

Element 10: Control De-watering

The goal of this element is to handle turbid or contaminated dewatering water separately from stormwater.

This element **does not** apply to my project because:

No dewatering of the site is anticipated.

Other Reason / Additional Comments:

If it **does** apply, describe the steps you will take and select the BMPs you will use:

Additional Comments:

Check the BMPs you will use:

C203 Water Bars

C236 Vegetated Filtration

C206 Level Spreader



CITY OF MERCER ISLAND

SECTION B: SMALL PROJECT CONSTRUCTION SWPPP NARRATIVE

Element 11: Maintain Best Management Practices

The goal of this element is to maintain and repair all temporary and permanent erosion and sediment control BMPs to assure continued performance.

Describe the steps you will take:

- Best Management Practices or BMPs shall be inspected and maintained during construction and removed within 30 days after the City Inspector or Engineer determines that the site is stabilized, provided that they may be removed when they are no longer needed.

Element 12: Manage the Project

The goal of this element is to ensure that the construction SWPPP is properly coordinated and that all BMPs are deployed at the proper time to achieve full compliance with City regulations throughout the project.

If it **does** apply, describe the steps you will take and select the BMPs you will use:

The Construction SWPPP will be implemented at all times. The applicable erosion control BMPs will be implemented in the following sequence:

- 1. Mark clearing limits
- 2. Install stabilized construction entrance
- 3. Install protection for existing drainage systems and permanent drain inlets
- 4. Establish staging areas for storage and handling polluted material and BMPs
- 5. Install sediment control BMPs
- 6. Grade and install stabilization measures for disturbed areas
- 7. Maintain BMPs until site stabilization, at which time they may be removed

Additional Comments:



CITY OF MERCER ISLAND

SECTION B: SMALL PROJECT CONSTRUCTION SWPPP NARRATIVE

Element 13: Protect Low Impact Development BMPs

The goal of this element is to protect on-site stormwater management BMPs (also known as “Low Impact Development BMPs”) from siltation and compaction during construction. On-site stormwater management BMPs used for runoff from roofs and other hard surfaces include: full dispersion, roof downspout full infiltration or dispersion systems, perforated stubout connections, rain gardens, bioretention systems, permeable pavement, sheetflow dispersion, and concentrated flow dispersion. Methods for protecting on-site stormwater management BMPs include sequencing the construction to install these BMPs at the latter part of the construction grading operations, excluding equipment from the BMPs and the associated areas, and using the erosion and sedimentation control BMPs listed below.

Describe the construction sequencing you will use:

Additional Comments:

Select the BMPs you will use:

- | | | |
|---|---|---|
| <input type="checkbox"/> C102 Buffer Zone | <input type="checkbox"/> C103 High Visibility Fence | <input type="checkbox"/> C231 Brush Barrier |
| <input type="checkbox"/> C233 Silt Fence | <input type="checkbox"/> C234 Vegetated Strip | |



CITY OF MERCER ISLAND

SECTION C: INFEASIBILITY CRITERIA

Minimum Requirement #5 (On-Site Stormwater Management)

The following tables summarize infeasibility criteria that can be used to justify not using various on-site stormwater management best management practices (BMPs) for consideration for Minimum Requirement #5. This information is also included under the detailed descriptions of each BMP in the 2014 Stormwater Management Manual for Western Washington (Stormwater Manual), but is provided here in this worksheet for additional clarity and efficiency. Where any inconsistencies or lack of clarity exists, the requirements in the main text of the Stormwater Manual shall be applied. If a project is limited by one or more of the infeasibility criteria specified below, but an applicant is interested in implementing a specific BMP, a functionally equivalent design may be submitted to the City for review and approval. Evaluate the feasibility of the BMPs in priority order based on List #1 or #2 (Small Project Stormwater Requirements Tip Sheet and Stormwater Manual). Select the first BMP that is considered feasible for each surface type. Document the infeasibility (narrative description and rationale) for each BMP that was not selected. Only one infeasibility criterion needs to be selected for a BMP before evaluating the next BMP on the list. Attach additional pages for supporting information if necessary.

Note: If your project discharges directly to Lake Washington (flow control exempt) or a downstream analysis confirms that the downstream system is free of capacity constraints for a minimum of ¼ mile and a maximum of 1 mile, then you do not need to complete this worksheet, but should still refer to the infeasibility criteria when selecting BMPs.

| Lawn and Landscaped Areas | | |
|--|---|---|
| BMP and Applicable Lists | Infeasibility Criteria | Infeasibility Description and Rationale for Each BMP Not Selected |
| Post-construction Soil Quality and Depth List #1 and #2 | <input type="checkbox"/> Siting and design criteria provided in BMP T5.13 (Stormwater Manual Volume V, Section 5.3) cannot be achieved. <input type="checkbox"/> Lawn and landscape area is on till slopes greater than 33 percent. | |
| Roofs | | |
| BMP and Applicable Lists | Infeasibility Criteria | Infeasibility Description and Rationale for Each BMP Not Selected |
| Full Dispersion List #1 and #2 | <input type="checkbox"/> Site setbacks and design criteria provided in BMP T5.30 (Stormwater Manual Volume V, Section 5.3) cannot be achieved. <input type="checkbox"/> A 65 to 10 ratio of forested or native vegetation area to impervious area cannot be achieved. <input type="checkbox"/> A minimum forested or native vegetation flowpath length of 100 feet (25 feet for sheet flow from a non-native pervious surface) cannot be achieved. | |
| Downspout Full Infiltration List #1 and #2 | <input type="checkbox"/> Evaluation of infiltration is not required per the Infiltration Infeasibility Map due to steep slopes, erosion hazards, or landslide hazards. <div style="text-align: center; font-size: 2em; font-weight: bold; border: 2px solid black; transform: rotate(-2deg); display: inline-block; padding: 5px;">N/A</div> <input type="checkbox"/> Site setbacks and design criteria provided in BMP T5.10A (Stormwater Manual Volume III, Section 3.1.1) cannot be achieved. <input type="checkbox"/> The lot(s) or site does not have out-wash or loam soils. <input type="checkbox"/> There is not at least 3 feet or more of permeable soil from the proposed final grade to the seasonal high groundwater table or other impermeable layer. <input type="checkbox"/> There is not at least 1 foot or more of permeable soil from the proposed bottom of the infiltration system to the seasonal high groundwater table or other impermeable layer. | |



CITY OF MERCER ISLAND

SECTION C: INFEASIBILITY CRITERIA

| Roofs (cont.) | | |
|--|---|---|
| BMP and Applicable Lists | Infeasibility Criteria | Infeasibility Description and Rationale for Each BMP Not Selected |
| Bioretention or Rain Gardens List #1 (both) and List #2 (bioretention only) | <p><i>Note: Criteria with setback distances are as measured from the bottom edge of the bioretention soil mix.</i></p> <p>Citation of any of the following infeasibility criteria must be based on an evaluation of site-specific conditions and a written recommendation from an appropriate licensed professional (e.g., engineer, geologist, hydrogeologist):</p> <ul style="list-style-type: none"> <input type="checkbox"/> Where professional geotechnical evaluation recommends infiltration not be used due to reasonable concerns about erosion, slope failure, or down-gradient flooding. <input type="checkbox"/> Within an area whose ground water drains into an erosion hazard, or landslide hazard area. <input type="checkbox"/> Where the only area available for siting would threaten the safety or reliability of pre-existing underground utilities, pre-existing underground storage tanks, pre-existing structures, or pre-existing road or parking lot surfaces. <input type="checkbox"/> Where the only area available for siting does not allow for a safe overflow pathway to stormwater drainage system or private storm sewer system. <input type="checkbox"/> Where there is a lack of bioretention areas at re-development sites, or where there is insufficient space within the existing public right-of-way on public road projects. <input type="checkbox"/> Where infiltrating water would threaten existing below grade basements. <input type="checkbox"/> Where infiltrating water would threaten shoreline structures such as bulkheads. <p>The following criteria can be cited as reasons for infeasibility without further justification (though some require professional services to make the observation):</p> <ul style="list-style-type: none"> <input type="checkbox"/> Evaluation of infiltration is not required per the Infiltration Infeasibility Map due to steep slopes, erosion hazards, or landslide hazards <input type="checkbox"/> Within setback provided for BMP T7.30 (Stormwater Manual Volume V, Section 7.4) <input type="checkbox"/> Where they are not compatible with surrounding drainage system as determined by the city (e.g., project drains to an existing stormwater collection system whose elevation or location precludes connection to a properly functioning bioretention area). | <div style="border: 2px solid black; padding: 5px; display: inline-block; color: red; font-weight: bold; transform: rotate(-2deg);">N/A</div> |



CITY OF MERCER ISLAND

SECTION C: INFEASIBILITY CRITERIA

| Roofs (cont.) | | |
|--------------------------------------|---|---|
| BMP and Applicable Lists | Infeasibility Criteria | Infeasibility Description and Rationale for Each BMP Not Selected |
| Bioretention or Rain Gardens (cont.) | <p>The following criteria can be cited as reasons for infeasibility without further justification (though some require professional services to make the observation):</p> <ul style="list-style-type: none"> <input type="checkbox"/> Where land for bioretention is within an erosion hazard, or landslide hazard area (as defined by MICC 19.07.060). <input type="checkbox"/> Where the site cannot be designed to locate bioretention areas on slopes greater than 8 percent. <input type="checkbox"/> Within 50 feet from the top of slopes that are greater than 20 percent and over 10 feet of vertical relief. <input type="checkbox"/> For properties with known soil or groundwater contamination (typically federal Superfund sites or state cleanup sites under the Model Toxics Control Act [MTCA]): <ul style="list-style-type: none"> • Within 100 feet of an area known to have deep soil contamination. • Where groundwater modeling indicates infiltration will likely increase or change the direction of the migration of pollutants in the groundwater. • Wherever surface soils have been found to be contaminated unless those soils are removed within 10 horizontal feet from the infiltration area. • Any area where these facilities are prohibited by an approved cleanup plan under the state MTCA or Federal Superfund Law, or an environmental covenant under Chapter 64.70 RCW. <input type="checkbox"/> Within 100 feet of a closed or active landfill. <input type="checkbox"/> Within 10 feet of an underground storage tank and connecting underground pipes when the capacity of the tank and pipe system is 1,100 gallons or less. As used in these criteria, an underground storage tank means any tank used to store petroleum products, chemicals, or liquid hazardous wastes of which 10 percent or more of the storage volume (including volume in the connecting piping system) is beneath the ground surface. <input type="checkbox"/> Within 100 feet of an underground storage tank and connecting underground pipes when the capacity of the tank and pipe system is greater than 1,100 gallons. | |

N/A



CITY OF MERCER ISLAND

SECTION C: INFEASIBILITY CRITERIA

| Roofs (cont.) | | |
|--------------------------------------|--|---|
| BMP and Applicable Lists | Infeasibility Criteria | Infeasibility Description and Rationale for Each BMP Not Selected |
| Bioretention or Rain Gardens (cont.) | <p>The following criteria can be cited as reasons for infeasibility without further justification (though some require professional services to make the observation):</p> <ul style="list-style-type: none"> <input type="checkbox"/> Where field testing indicates potential bioretention/rain garden sites have a measured (a.k.a., initial) native soil saturated hydraulic conductivity less than 0.30 inches per hour. A small-scale or large-scale PIT in accordance with the Water Manual Volume III, Section 3.3.6 (or an alternate test specified by the City) shall be used to demonstrate infeasibility of bioretention areas. If the measured native soil infiltration rate is less than 0.30 in/hour, bioretention/rain garden BMPs are not required to be evaluated as an option in List #1 or List #2. In these slow draining soils, a bioretention area with an underdrain may be used to treat pollution-generating surfaces to help meet Minimum Requirement #6, Runoff Treatment. If the underdrain is elevated within a base course of gravel, it will also provide some modest flow reduction benefit that will help achieve Minimum Requirement #7. <input type="checkbox"/> Where the minimum vertical separation of 3 feet to the seasonal high groundwater elevation or other impermeable layer would not be achieved below bioretention that would serve a drainage area that exceeds the following thresholds (and cannot reasonably be broken down into amounts smaller than indicated): <ul style="list-style-type: none"> o 5,000 square feet of pollution-generating impervious surface (PGIS) o 10,000 square feet of impervious area o 0.75 acres of lawn and landscape. <input type="checkbox"/> Where the minimum vertical separation of 1 foot to the seasonal high groundwater or other impermeable layer would not be achieved below bioretention that would serve a drainage area less than the above thresholds. <input type="checkbox"/> Within 100 feet of a drinking water well, or a spring used for drinking water supply. <input type="checkbox"/> Within 10 feet of small on-site sewage disposal drainfield, including reserve areas, and grey water reuse systems. For setbacks from a "large on-site sewage disposal system," see Chapter 246-272B WAC. | |



CITY OF MERCER ISLAND

SECTION C: INFEASIBILITY CRITERIA

| Roofs (cont.) | | |
|---|---|---|
| BMP and Applicable Lists | Infeasibility Criteria | Infeasibility Description and Rationale for Each BMP Not Selected |
| Downspout Dispersion Systems List #1 and #2 | <ul style="list-style-type: none"> <input type="checkbox"/> Site setbacks and design criteria provided in BMP T5.10B (Stormwater Manual Volume III, Section 3.1.2) cannot be achieved. <input type="checkbox"/> For splash blocks, a vegetated flowpath at least 50 feet in length from the downspout to the downstream property line, structure, stream, wetland, slope over 15 percent to other impervious surface is not feasible. <input type="checkbox"/> For trenches, a vegetated flowpath of at least 25 feet in between the outlet of the trench and any property line, structure, stream, wetland, or impervious surface is not feasible. A vegetated flowpath of at least 50 feet between the outlet of the trench and any slope steeper than 15 percent is not feasible. <div style="text-align: center; border: 2px solid black; padding: 5px; width: fit-content; margin: 10px auto;"> <p style="color: red; font-weight: bold; font-size: 1.2em;">N/A</p> </div> | |
| Perforated Stub-Out Connections List #1 and #2 | <ul style="list-style-type: none"> <input type="checkbox"/> Evaluation of infiltration is not required per the Infiltration Infeasibility Map due to steep slopes, erosion hazards, or landslide hazards <input type="checkbox"/> For sites with septic systems, the only location available for the perforated portion of the pipe is located up-gradient of the drainfield primary and reserve areas. This requirement can be waived if site topography will clearly prohibit flows from intersecting the drainfield or where site conditions (soil permeability, distance between systems, etc.) indicate that this is unnecessary. <input type="checkbox"/> Site setbacks and design criteria provided in BMP T5.10C (Stormwater Manual Volume III, Section 3.1.3) cannot be achieved. <input type="checkbox"/> There is not at least 1 foot of permeable soil from the proposed bottom (final grade) of the perforated stub-out connection trench to the highest estimated groundwater table or other impermeable layer. <input type="checkbox"/> The only location available for the perforated stub-out connection is under impervious or heavily compacted soils. | |
| On-site Detention List #1 and #2 | <ul style="list-style-type: none"> <input type="checkbox"/> Project discharges directly to Lake Washington. <input type="checkbox"/> Findings from a 1/4 mile downstream analysis confirm that the downstream system is free of capacity constraints. <input type="checkbox"/> Site setbacks and design criteria provided in the Stormwater Manual (Volume III, Section 3.2.2) cannot be achieved. | |



CITY OF MERCER ISLAND

SECTION C: INFEASIBILITY CRITERIA

| Other Hard Surfaces | | |
|--------------------------------------|---|---|
| BMP and Applicable Lists | Infeasibility Criteria | Infeasibility Description and Rationale for Each BMP Not Selected |
| Full Dispersion List #1 and #2 | <ul style="list-style-type: none"> <input type="checkbox"/> Site setbacks and design criteria provided in BMP T5.30 (Stormwater Manual Volume V, Section 5.3) cannot be achieved. <input type="checkbox"/> A 65 to 10 ratio of forested or native vegetation area to impervious area cannot be achieved. <input type="checkbox"/> A minimum forested or native vegetation flowpath length of 100 feet (25 feet for sheltered native pervious surface) cannot be achieved. <div style="border: 2px solid black; padding: 5px; display: inline-block; transform: rotate(-2deg); color: red; font-weight: bold; font-size: 1.2em;">N/A</div> | |
| Permeable Pavement List #1 and #2 | <p>Citation of any of the following infeasibility criteria must be based on an evaluation of site-specific conditions and a written recommendation from an appropriate licensed professional (e.g., engineer, geologist, hydrogeologist):</p> <ul style="list-style-type: none"> <input type="checkbox"/> Where professional geotechnical evaluation recommends infiltration not be used due to reasonable concerns about erosion, slope failure, or downgradient flooding. <input type="checkbox"/> Within an area whose ground water drains into an erosion hazard, or landslide hazard area. <input type="checkbox"/> Where infiltrating and ponded water below the new permeable pavement area would compromise adjacent impervious pavements. <input type="checkbox"/> Where infiltrating water below a new permeable pavement area would threaten existing below grade basements. <input type="checkbox"/> Where infiltrating water would threaten shoreline structures such as bulkheads. <input type="checkbox"/> Down slope of steep, erosion prone areas that are likely to deliver sediment. <input type="checkbox"/> Where fill soils are used that can become unstable when saturated. <input type="checkbox"/> Excessively steep slopes where water within the aggregate base layer or at the subgrade surface cannot be controlled by detention structures and may cause erosion and structural failure, or where surface runoff velocities may preclude adequate infiltration at the pavement surface. <input type="checkbox"/> Where permeable pavements cannot provide sufficient strength to support heavy loads at industrial facilities such as ports. <input type="checkbox"/> Where installation of permeable pavement would threaten the safety or reliability of pre-existing underground utilities, pre-existing underground storage tanks, or pre-existing road subgrades. | |



CITY OF MERCER ISLAND

SECTION C: INFEASIBILITY CRITERIA

| Other Hard Surfaces (cont.) | | |
|-----------------------------|--|---|
| BMP and Applicable Lists | Infeasibility Criteria | Infeasibility Description and Rationale for Each BMP Not Selected |
| Permeable Pavement (cont.) | <p>The following criteria can be cited as reasons for infeasibility without further justification (though some require professional services to make the observation):</p> <ul style="list-style-type: none"> <input type="checkbox"/> Evaluation of infiltration is not required per the Infiltration Infeasibility Map due to steep slopes, erosion hazards, or landslide hazards <input type="checkbox"/> Within an area designated as an erosion hazard, or landslide hazard. <input type="checkbox"/> Within 50 feet from a slope of slopes that are greater than 20 percent. <input type="checkbox"/> For properties with known soil or groundwater contamination (typically federal Superfund sites or state cleanup sites under MTCA): <ul style="list-style-type: none"> • Within 100 feet of an area known to have deep soil contamination. • Where groundwater modeling indicates infiltration will likely increase or change the direction of the migration of pollutants in the groundwater. • Wherever surface soils have been found to be contaminated unless those soils are removed within 10 horizontal feet from the infiltration area. • Any area where these facilities are prohibited by an approved cleanup plan under the state MTCA or Federal Superfund Law, or an environmental covenant under Chapter 64.70 RCW. <input type="checkbox"/> Within 100 feet of a closed or active landfill. <input type="checkbox"/> Within 100 feet of a drinking water well, or a spring used for drinking water supply, if the pavement is a pollution-generating surface. <input type="checkbox"/> Within 10 feet of a small on-site sewage disposal drainfield, including reserve areas, and grey water reuse systems. For setbacks from a "large on-site sewage disposal system," see Chapter 246-272B WAC. <input type="checkbox"/> Within 10 feet of any underground storage tank and connecting underground pipes, regardless of tank size. As used in these criteria, an underground storage tank means any tank used to store petroleum products, chemicals, or liquid hazardous wastes of which 10 percent or more of the storage volume (including volume in the connecting piping system) is beneath the ground surface. <input type="checkbox"/> At multi-level parking garages, and over culverts and bridges. <input type="checkbox"/> Where the site design cannot avoid putting pavement in areas likely to have long-term excessive sediment deposition after construction (e.g., construction and landscaping material yards). | <div style="border: 2px solid black; padding: 5px; display: inline-block; color: red; font-weight: bold; font-size: 1.5em;">N/A</div> |



CITY OF MERCER ISLAND

SECTION C: INFEASIBILITY CRITERIA

| Other Hard Surfaces (cont.) | | |
|-----------------------------|--|---|
| BMP and Applicable Lists | Infeasibility Criteria | Infeasibility Description and Rationale for Each BMP Not Selected |
| Permeable Pavement (cont.) | <p>The following criteria can be cited as reasons for infeasibility without further justification (though some require professional services to make the observation):</p> <ul style="list-style-type: none"> <input type="checkbox"/> Where the site cannot reasonably be designed to have: <ul style="list-style-type: none"> • Porous asphalt surface < 5% slope • Pervious concrete surface < 10% slope • Permeable interlocking concrete pavement surface < 12% N/A • Grid < 12% slope (check with manufacturer and local supplier to confirm maximum slope) <input type="checkbox"/> Where the subgrade soils below a pollution-generating permeable pavement (e.g., road or parking lot) do not meet the soil suitability criteria for providing treatment. See soil suitability criteria for treatment in the Stormwater Manual Volume III, Section 3.3.7. Note: In these instances, the city may approve installation of a 6 inch sand filter layer meeting city specifications for treatment as a condition of construction. <input type="checkbox"/> Where underlying soils are unsuitable for supporting traffic loads when saturated. Soils meeting a California Bearing Ratio of 5 percent are considered suitable for residential access roads. <input type="checkbox"/> Where replacing existing impervious surfaces unless the existing surface is a non-pollution generating surface over an outwash soil with a saturated hydraulic conductivity of 4 inches per hour or greater. <input type="checkbox"/> Where appropriate field testing indicates soils have a measured (a.k.a., initial) subgrade soil saturated hydraulic conductivity less than 0.3 inches per hour. Only small-scale PIT or large-scale PIT methods in accordance with Stormwater Manual Volume III, Section 3.3.6 (or an alternative small scale test specified by the City) shall be used to evaluate infeasibility of permeable pavement areas. (Note: In these instances, unless other infeasibility restrictions apply, roads and parking lots may be built with an underdrain, preferably elevated within the base course, if flow control benefits are desired.) <input type="checkbox"/> Roads that receive more than very low traffic volumes, and areas having more than very low truck traffic. Roads with a projected average daily traffic volume of 400 vehicles or less are very low volume roads (AASHTO 2001) (U.S. Department of Transportation, 2013). Areas with very low truck traffic volumes are roads and other areas not subject to through truck traffic but may receive up to weekly use by utility trucks (e.g., garbage, recycling), daily school bus use, and multiple daily use by pick-up trucks, mail/parcel delivery trucks, and maintenance vehicles. (Note: This infeasibility criterion does not extend to sidewalks and other non-traffic bearing surfaces associated with the collector or arterial). | |



CITY OF MERCER ISLAND

SECTION C: INFEASIBILITY CRITERIA

| Other Hard Surfaces (cont.) | | |
|--|--|---|
| BMP and Applicable Lists | Infeasibility Criteria | Infeasibility Description and Rationale for Each BMP Not Selected |
| Permeable Pavement (cont.) | <p>The following criteria can be cited as reasons for infeasibility without further justification (though some require professional services to make the observation):</p> <ul style="list-style-type: none"> <input type="checkbox"/> At sites defined as “high-use sites” (refer to the Glossary in the Stormwater Manual Volume I). <input type="checkbox"/> In areas with “industrial activity” identified in 40 CFR 122.26(b)(14). <input type="checkbox"/> Where the risk of hazardous liquid spills is more likely such as gas stations, truck stops, and industrial chemical storage sites. <input type="checkbox"/> Where routine, heavy applications of sand occur in frequent snow zones to maintain traction during weeks of snow and ice accumulation. <input type="checkbox"/> Where the seasonal high groundwater or an underlying impermeable/low permeable layer would create saturated conditions within 1 foot of the bottom of the lowest gravel base course. | |
| Bioretention or Rain Gardens List #1 (both) and List #2 (bioretention only) | <p><i>Note: Criteria with setback distances are as measured from the bottom edge of the bioretention soil mix.</i></p> <p>Citation of any of the following infeasibility criteria must be based on an evaluation of site-specific conditions and a written recommendation from an appropriate licensed professional (e.g., engineer, geologist, hydrogeologist):</p> <ul style="list-style-type: none"> <input type="checkbox"/> Where professional geotechnical evaluation recommends infiltration not be used due to reasonable concerns about erosion, slope failure, or down-gradient flooding. <input type="checkbox"/> Within an area whose ground water drains into an erosion hazard, or landslide hazard area. <input type="checkbox"/> Where the only area available for siting would threaten the safety or reliability of pre-existing underground utilities, pre-existing underground storage tanks, pre-existing structures, or pre-existing road or parking lot surfaces. <input type="checkbox"/> Where the only area available for siting does not allow for a safe overflow pathway to stormwater drainage system or private storm sewer system. <input type="checkbox"/> Where there is a lack of usable space for bioretention areas at re-development sites, or where there is insufficient space within the existing public right-of-way on public road projects. <input type="checkbox"/> Where infiltrating water would threaten existing below grade basements. <input type="checkbox"/> Where infiltrating water would threaten shoreline structures such as bulkheads. | |



CITY OF MERCER ISLAND

SECTION C: INFEASIBILITY CRITERIA

| Other Hard Surfaces (cont.) | | |
|--------------------------------------|---|---|
| BMP and Applicable Lists | Infeasibility Criteria | Infeasibility Description and Rationale for Each BMP Not Selected |
| Bioretention or Rain Gardens (cont.) | <p>The following criteria can be cited as reasons for infeasibility without further justification (though some require professional services to make the observation):</p> <ul style="list-style-type: none"> <input type="checkbox"/> Where evaluation of infiltration is not required per the Infiltration Infeasibility Map due to steep slopes, erosion hazards, or landslide hazards. <input type="checkbox"/> Within setback provided for D₅₀ 7.30 (Stormwater Manual Volume V, Section 7.4) <input type="checkbox"/> Where they are not compatible with surrounding drainage system as determined by the city (e.g., project drains to an existing stormwater collection system whose elevation or location precludes connection to a properly functioning bioretention area). <input type="checkbox"/> Where land for bioretention is within an erosion hazard, or landslide hazard area (as defined by MICC 19.07.060). <input type="checkbox"/> Where the site cannot be reasonably designed to locate bioretention areas on slopes less than 8 percent. <input type="checkbox"/> Within 50 feet from the top of slopes that are greater than 20 percent and over 10 feet of vertical relief. <input type="checkbox"/> For properties with known soil or groundwater contamination (typically federal Superfund sites or state cleanup sites under the Model Toxics Control Act [MTCA]): <ul style="list-style-type: none"> • Within 100 feet of an area known to have deep soil contamination. • Where groundwater modeling indicates infiltration will likely increase or change the direction of the migration of pollutants in the groundwater. • Wherever surface soils have been found to be contaminated unless those soils are removed within 10 horizontal feet from the infiltration area. • Any area where these facilities are prohibited by an approved cleanup plan under the state MTCA or Federal Superfund Law, or an environmental covenant under Chapter 64.70 RCW. <input type="checkbox"/> Within 100 feet of a closed or active landfill. <input type="checkbox"/> Within 10 feet of an underground storage tank and connecting underground pipes when the capacity of the tank and pipe system is 1,100 gallons or less. As used in these criteria, an underground storage tank means any tank used to store petroleum products, chemicals, or liquid hazardous wastes of which 10 percent or more of the storage volume (including volume in the connecting piping system) is beneath the ground surface. | <div style="border: 2px solid black; padding: 5px; display: inline-block; color: red; font-weight: bold; font-size: 1.5em;">N/A</div> |



CITY OF MERCER ISLAND

SECTION C: INFEASIBILITY CRITERIA

| Other Hard Surfaces (cont.) | | |
|--------------------------------------|--|---|
| BMP and Applicable Lists | Infeasibility Criteria | Infeasibility Description and Rationale for Each BMP Not Selected |
| Bioretention or Rain Gardens (cont.) | <p>The following criteria can be cited as reasons for infeasibility without further justification (though some require professional services to make the observation):</p> <ul style="list-style-type: none"> <input type="checkbox"/> Within 100 feet of an underground storage tank and connecting underground pipes when the capacity of the tank and pipe system is greater than 1,100 gallons. <input type="checkbox"/> Where field tests (initial) native soil saturated hydraulic conductivity less than 0.30 inches per hour. A small-scale or large-scale PIT in accordance with Stormwater Manual Volume III, Section 3.3.6 (or an alternative small scale test specified by the City) shall be used to demonstrate infeasibility of bioretention areas. If the measured native soil infiltration rate is less than 0.30 in/hour, bioretention/rain garden BMPs are not required to be evaluated as an option in List #1 or List #2. In these slow draining soils, a bioretention area with an underdrain may be used to treat pollution-generating surfaces to help meet Minimum Requirement #6, Runoff Treatment. If the underdrain is elevated within a base course of gravel, it will also provide some modest flow reduction benefit that will help achieve Minimum Requirement #7. <input type="checkbox"/> Where the minimum vertical separation of 3 feet to the seasonal high groundwater elevation or other impermeable layer would not be achieved below bioretention that would serve a drainage area that exceeds the following thresholds (and cannot reasonably be broken down into amounts smaller than indicated): <ul style="list-style-type: none"> o 5,000 square feet of pollution-generating impervious surface (PGIS) o 10,000 square feet of impervious area o 0.75 acres of lawn and landscape. <input type="checkbox"/> Where the minimum vertical separation of 1 foot to the seasonal high groundwater or other impermeable layer would not be achieved below bioretention that would serve a drainage area less than the above thresholds <input type="checkbox"/> Within 100 feet of a drinking water well, or a spring used for drinking water supply. <input type="checkbox"/> Within 10 feet of small on-site sewage disposal drainfield, including reserve areas, and grey water reuse systems. For setbacks from a "large on-site sewage disposal system," see Chapter 246-272B WAC. | |

N/A



CITY OF MERCER ISLAND

SECTION C: INFEASIBILITY CRITERIA

| Other Hard Surfaces (cont.) | | |
|--|--|---|
| BMP and Applicable Lists | Infeasibility Criteria | Infeasibility Description and Rationale for Each BMP Not Selected |
| Sheet Flow Dispersion List #1 and #2 | <input type="checkbox"/> Site setbacks and design criteria provided in BMP T5.12 (Stormwater Manual Volume V, Section 5.3) cannot be achieved. <input type="checkbox"/> Positive drainage for sheet flow runoff cannot be achieved. <input type="checkbox"/> Area to be dispersed (e.g., driveway, patio) cannot be graded to have less than a 15 percent slope. <input type="checkbox"/> For flat to moderate slopes, at least a 10 foot-wide vegetation buffer for dispersion of the adjacent 20 feet of contributing surface cannot be achieved. For variably sloped areas, at least a 25 foot vegetated flowpath between berms cannot be achieved. <div style="text-align: center; border: 2px solid black; padding: 5px; width: fit-content; margin: 10px auto;">N/A</div> | |
| Concentrated Flow Dispersion List #1 and #2 | <input type="checkbox"/> Site setbacks and design criteria provided in BMP T5.11 (Stormwater Manual Volume V, Section 5.3) cannot be achieved. <input type="checkbox"/> A minimum 3 foot length of rock pad and 50 foot flowpath OR a dispersion trench and 25 foot flowpath for every 700 square feet of drainage area followed with applicable setbacks cannot be achieved. <input type="checkbox"/> More than 700 square feet drainage area drains to any dispersion device. | |
| On-site Detention List #1 and #2 | <input type="checkbox"/> Project discharges directly to Lake Washington. <input type="checkbox"/> Findings from a 1/4 mile downstream analysis confirm that the downstream system is free of capacity constraints. <input type="checkbox"/> Site setbacks and design criteria provided in the Stormwater Manual (Volume III, Section 3.2.2) cannot be achieved. | |



CITY OF MERCER ISLAND

SECTION D: POST-CONSTRUCTION SOIL MANAGEMENT

Attachments Required *(Check off required items that are attached)*

| | |
|---|--|
| <input type="checkbox"/> Site Plan showing, to scale: <div style="text-align: center; color: blue;">(see C2.0)</div> | <input type="checkbox"/> Areas of undisturbed native vegetation (no amendment required) <input type="checkbox"/> New planting beds (amendment required) <input type="checkbox"/> New turf areas (amendment required) <input type="checkbox"/> Type of soil improvement proposed for each area |
| <input type="checkbox"/> Soil test results (required if proposing custom amendment rates) | |
| <input type="checkbox"/> Product test results for proposed amendments | |

Total Amendment / Topsoil / Mulch for All Areas

Calculate the quantities needed for the entire site based on all of the areas identified on the Site Plan and the calculations on the following page(s):

| Product | Total Quantity (CY) | Test Results |
|-------------------|---------------------|--|
| Product #1: _____ | _____ CY | _____ % organic matter _____ C:N ratio "Stable"? yes <input type="checkbox"/> no <input type="checkbox"/> |
| Product #2: _____ | _____ CY | _____ % organic matter _____ C:N ratio "Stable"? yes <input type="checkbox"/> no <input type="checkbox"/> |
| Product #3: _____ | _____ CY | _____ % organic matter _____ C:N ratio "Stable"? yes <input type="checkbox"/> no <input type="checkbox"/> |

CY = cubic yards, C:N = Carbon:Nitrogen



CITY OF MERCER ISLAND

SECTION D: POST-CONSTRUCTION SOIL MANAGEMENT

Amendment / Topsoil / Mulch by Area

For each identified area on your Site Plan, provide the following information: (Use additional sheets if necessary)

Area # _____ (should match identified Area # on Site Plan)

Planting type: Turf Undisturbed native vegetation
 Planting Beds Other: _____

Pre-Approved Amendment Method

| | | | |
|--------------------------|---------------------|---|----------------|
| <input type="checkbox"/> | Amend with compost | Turf: _____ SF x 5.4 CY ÷ 1,000 SF = _____ CY Planting beds: _____ SF x 9.3 CY ÷ 1,000 SF = _____ CY Total Quantity = _____ CY Scarification depth: 8 inches | Product: _____ |
| <input type="checkbox"/> | Stockpile and amend | Turf: _____ SF x 5.4 CY ÷ 1,000 SF = _____ CY Planting beds: _____ SF x 9.3 CY ÷ 1,000 SF = _____ CY Total Quantity = _____ CY Scarification depth: 8 inches | Product: _____ |
| <input type="checkbox"/> | Topsoil import | Turf: _____ SF x 18.6 CY ÷ 1,000 SF = _____ CY Planting beds: _____ SF x 18.6 CY ÷ 1,000 SF = _____ CY Total Quantity = _____ CY Scarification depth: 6 inches | Product: _____ |

Custom Amendment

| | | | |
|--------------------------|---------------------|--|----------------|
| <input type="checkbox"/> | Amend with compost | Attach information on bulk density, percent organic matter, moisture content, C:N ratio, and heavy metals analysis to support custom amendment rate and scarification depth. Total Quantity = _____ CY Scarification depth: _____ inches | Product: _____ |
| <input type="checkbox"/> | Stockpile and amend | Attach information on bulk density, percent organic matter, moisture content, C:N ratio, and heavy metals analysis to support custom amendment rate and scarification depth. Total Quantity = _____ CY Scarification depth: _____ inches | Product: _____ |

Mulch

| | | | |
|--------------------------|---------------------|--|----------------|
| <input type="checkbox"/> | Amend with compost | Planting beds: _____ SF x 12.4 CY ÷ 1,000 SF = _____ CY Total Quantity = _____ CY | Product: _____ |
| <input type="checkbox"/> | Stockpile and amend | Planting beds: _____ SF x 12.4 CY ÷ 1,000 SF = _____ CY Total Quantity = _____ CY | Product: _____ |
| <input type="checkbox"/> | Topsoil import | Planting beds: _____ SF x 12.4 CY ÷ 1,000 SF = _____ CY Total Quantity = _____ CY | Product: _____ |

CY = cubic yards, C:N = Carbon:Nitrogen



CITY OF MERCER ISLAND

SECTION E: SIGNATURE PAGE

Project Engineer's Certification for Section B

For Stormwater Site Plans with engineered elements, the Construction SWPPP is stamped by a professional engineer licensed in the State of Washington in civil engineering.

If required, attach a page with the project engineer's seal with the following statement:

*"I hereby state that this Construction Stormwater Pollution Prevention Plan for _____
(name of project)
has been prepared by me or under my supervision and meets the standard of care and expertise which is usual and customary in this community for professional engineers. I understand that the City of Mercer Island does not and will not assume liability for the sufficiency, suitability, or performance of Construction SWPPP BMPs prepared by me."*

Applicant Signature for Full Stormwater Package (Sections A through D)

I have read and completed the Stormwater Submittal Package and know the information provided to be true and correct.

Print Applicant Name: _____

Applicant Signature: _____ Date _____

