CITY OF MERCER ISLAND

COMMUNITY PLANNING & DEVELOPMENT

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SECTION A: SMALL PROJECT STORMWATER SITE PLAN/REPORT

Narrative and Plan Submittal

Instructions: This is a template for a simplified Stormwater Report. This form or an equivalent must accompany your Building Permit Application if the answer is "Yes" to each statement below. If "No" is the answer to one or more of the statements below, a full Drainage Report is required and the project does not qualify for use of the Small Project Stormwater Site Plan/Report template.

Select "yes" or "no" for each statement below. Answer "yes" if the statement accurately describes your project.

Yes	No	Statement
✔		This project disturbs less than 1 acre and is not part of a larger common plan of development.
✔		This project converts less than 3/4 acre to lawn or landscape areas.
✔		This project will create, add, or replace (in any combination) 2,000 square feet or greater, but less than 5,000 square feet, of new plus replaced hard surface **OR** will have a land disturbing activity of 7,000 square feet or greater **OR** will result in a net increase of impervious surface of 500 square feet or greater.
✔		This project will not adversely impact a wetland, stream, water of the state, or change a natural drainage course.

Basic Project Information

Project Name: Home #472 by MN Custom

Site Address: 7119 80th Avenue SE, Mercer Island, WA 98040

Total Lot Size: 14,753 sf

Total Proposed Area to be Disturbed (including stockpile area): 10,000 sq ft

Total Volume of Proposed Cut and Fill: 50 cy cut; 50 cy fill sq ft

Total Proposed New Hard Surface Area: < existing sq ft

Total Proposed Replaced Hard Surface Area: 4,750 sq ft

Total Proposed Converted Pervious Surface Area
(Native vegetation to lawn or landscape): 0 sq ft

Net Increase in Impervious Surface: Net reduction sq ft

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SECTION A: SMALL PROJECT STORMWATER SITE PLAN/REPORT

Minimum Requirement #1 : Preparation of Stormwater Site Plan

Written Project Description:

This new SFR home is proposed by MN Custom Homes on this lot. It is unknown what we are doing with the stormwater.

This lot is situated in the southwestern quadrant of Mercer Island about two blocks east of West Mercer Way. Total new + replaced impervious area is below 5,000 sf and proposed impervious area is less than existing. Per correspondence with Ruji Ding, detention is required because of downstream concern(s). Instead, 100% infiltration is proposed.

Calculate new or replaced areas by surface type:

Lawn or Landscape Areas: 10,000 sq ft	Roof Area: 4,080 sq ft

Other Hard Surface Areas:

Driveway: 569 sq ft Patio: _____ sq ft Sidewalk: 91 sq ft

Parking Lot: _____ sq ft Other: _____ sq ft

☑ Attach Drainage Plan

Drainage Plan shall include the following:

- Scaled drawing with slopes, lot lines, any public-right-of-way and any easements, location of each on-site stormwater management BMP selected above and the areas served by them, buildings, roads, parking lots, driveways, landscape features, and areas of disturbed soils to be amended.
- The scaled drawing must be suitable to serve as a recordable document that will be attached to the property deed for each lot that includes on-site BMPs. Document submittal must follow the "Standard Formatting Requirements for Recording Documents" per King County: www.kingcounty.gov/depts/records-licensing/recorders-office/recording-documents.aspx
- Identify design details and maintenance instructions for each on-site BMP, and attach them to this Small Project Stormwater Site Plan/Report.

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SECTION A: SMALL PROJECT STORMWATER SITE PLAN/REPORT

Minimum Requirement #2 : Construction Stormwater Pollution Prevention

☑ Complete Section B of this submittal package: Construction Stormwater Pollution Prevention Plan Narrative (SWPPP)

☑ Attach construction SWPPP **see civil sheet C1.0 Erosion Control Plan**

Minimum Requirement #3 : Source Control of Pollution

This section contains practices and procedures to reduce the release of pollutants. Provide a description of all known, available and reasonable source control BMPs that will be, or are anticipated to be, used at this location to prevent stormwater from coming into contact with pollutants. Additional BMPs are found in Volume IV of the 2014 Stormwater Management Manual for Western Washington (SWMMWW).

Check the BMPs you will use:

☐ BMP S411 for Landscaping and Lawn/ Vegetation Management
Operational practices for sites with landscaping

☐ BMP S421 for Parking and Storage of Vehicles.
Public and commercial parking lots can be sources of suspended solids, metals, or toxic hydrocarbons such oils and greases.

☐ BMP S433 for Pools, Spas, Hot Tubs, Fountains
Discharge from pools, hot tubs, and fountains can degrade ambient water quality. Routine maintenance activities generate a variety of wastes. Direct disposal of these waters to drainage system and waters of the state are not permitted without prior treatment and approval.

☐ Other BMPs found in Volume IV of SWMMWW applicable to project:

Special source control BMP's should not be warranted for this SFR project outside of control of construction-related disturbance of sediment.

☑ No source control BMPs are applicable for this project.

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Minimum Requirement #4 : Preservation of Natural Drainage Systems

Natural drainage patterns shall be maintained and discharges from the project site shall occur at the natural location, to the maximum extent practicable. All outfalls require energy dissipation.

Choose the option below that best describes your project:

☑ This site has existing drainage systems or outfalls. These items are shown on the Drainage Plan. Include the following items on the Drainage Plan:

- Pipe invert elevations, slopes, cover, and material
- Locations, grades, and direction of flow in ditches and swales, culverts, and pipes

Describe how these systems will be preserved:

See civil sheet C1.0 & C2.0 plans for understanding of storm drainage infrastructure both existing and proposed condition. The stormwater from the existing roof is likely splash-blocked away from the house. 100% infiltration is proposed for this project's stormwater.

☑ This site does not have any existing drainage systems or outfalls.

Additional Comments:

To the best of our knowledge the existing house does not have any formal drainage system.

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SECTION A: SMALL PROJECT STORMWATER SITE PLAN/REPORT

Minimum Requirement #5 : On-site Stormwater Management

All projects meeting the thresholds for this Small Project Stormwater Report shall employ on-site stormwater management BMPs (See Small Project Stormwater Requirements Tip Sheet) to infiltrate, disperse, and retain stormwater runoff on-site to the extent feasible without causing flooding or erosion impacts.

List #1

For each category select the *first* feasible item on the list below. Document your justification for each infeasible BMP in Section C of this submittal package.

Check one option for each category below:

Lawn and Landscape Areas

- ☐ My project does not have *Lawn or Landscape* areas
- ☑ Post-construction soil quality and depth
- ☐ Post-construction soil quality and depth is infeasible (see Section C of this submittal package)

Roofs

- ☐ My project does not have *Roof* areas
- ☑ 1. Full dispersion or downspout full infiltration
- ☐ 2. Rain garden or bioretention
- ☐ 3. Downspout dispersion system
- ☐ 4. Perforated stub-out connections
- ☐ 5. On-site detention system or fee-in-lieu of on-site detention authorized by the City Engineer (applicable if options #1-4 are infeasible and drainage from the site will be discharged to a storm or surface water system that includes a watercourse or there is a capacity constraint in the system)
- ☐ 6. No Roof BMP (applicable if options #1-4 are infeasible and on-site detention is not required)

Measured Infiltration Rate: perform upon request _____ in/ hr

If #5 or #6 is selected, briefly describe why no Roof BMP is feasible (include detailed information in Section C of this submittal package):

100% infiltration proposed on north side of new house as presented on sheet C2.0. Soil profile is recessional outwash (very sandy) situated over a denser vashon lodgement till interface beginning at an estimated depth of 5.5 feet.

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Minimum Requirement #5 : On-site Stormwater Management (cont.)

Other Hard Surfaces (such as driveway, sidewalk, parking lot, patio, etc.)

- ☐ My project does not have *Other Hard Surface* areas

Measured Infiltration Rate: not avail. in/ hr

- ☐ 1. Full dispersion
- ☐ 2. Permeable pavement, rain gardens, or bioretention
- ☐ 3. Sheet flow dispersion or concentrated flow dispersion
- ☐ 4. On-site detention system or fee-in-lieu of on-site detention authorized by the City Engineer (applicable if options #1-3 are infeasible and drainage from the site will be discharged to a storm or surface water system that includes a watercourse or there is a capacity constraint in the system)
- ☑ 5. No Other Hard Surface BMP (applicable if options #1-3 are infeasible and on-site detention is not required)

If #4 or #5 is selected, briefly describe why no Other Hard Surface BMP is feasible (include detailed information in Section C of this submittal package):

Infiltration proposed serving the driveway surface. See sheet C2.0 for details and sizing

Flow Control Exempt List

Proceed with this list if your project discharges directly to Lake Washington or if findings from a downstream analysis confirm that the downstream system is free of capacity constraints for a minimum of ¼ mile and a maximum of 1 mile.

For flow control exempt discharges, the BMPs listed below for Roofs and Other Hard Surfaces do not need to be evaluated in priority order. You can select any BMP from the lists provided below and do not need to document infeasibility in Section C of this submittal package.

Check one option for each category below:

Lawn and Landscape Areas

- ☐ My project does not have *Lawn or Landscape* areas
- ☑ Post-construction soil quality and depth

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Minimum Requirement #5 : On-site Stormwater Management (cont.)

Roofs

- ☐ My project does not have *Roof* areas
- ☑ Downspout full infiltration
- ☐ Downspout dispersion system
- ☐ Perforated stub-out connections
- ☐ Each item above is infeasible

If "Each item above is infeasible" is selected, briefly describe why no Roof BMP is feasible:

Infiltration serving roof and driveway. upper soil stratum is recessional outwash.

Other Hard Surfaces (such as driveway, sidewalk, parking lot, patio, etc.)

- ☐ My project does not have *Other Hard Surface* areas
- ☐ Sheet flow dispersion
- ☐ Concentrated flow dispersion
- ☑ Each item above is infeasible

If "Each item above is infeasible" is selected, briefly describe why no Other Hard Surface BMP is feasible:

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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 quality 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:

A new single family house proposed on subject lot. The builder is MN Custom Homes who has built houses on Mercer Island before. The lot slopes to the northwest at an average 9% gradient. In terms of critical areas, according to the Mercer Island public mapping portal, wind exposure and Wind Speed-Up (1.6) is present throughout the larger area. We are not aware of any other mapped critical areas.

The proposed on-site "new + replaced" impervious area is roughly 4,750 sf including roof and new driveway surface area. According to the city engineer, Ruji Ding, this site does require detention due to a downstream concern. Instead, proposed is 100% shallow infiltration in the back yard.

We don't anticipate erosion control during construction to be a problem if proper measures are kept up during construction including maintaining silt fence along the lower half of project.

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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):

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

Temporary and Permanent BMPs

Include the following on site map (where applicable):

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

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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:

See our sheet C1.0 for estimated limits of disturbance and recommended silt fence configuration.

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:

See our sheet C1.0 for estimated limits of disturbance and recommended silt fence configuration.

Check the BMPs you will use:

☑ C101 Preserving Natural Vegetation ☐ C102 Buffer Zones ☑ C103 High Visibility Fence

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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:

See our sheet C1.0 for estimated limits of disturbance and recommended silt fence configuration along with utilizing existing driveway for construction entry.

*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:

See our sheet C1.0 for estimated limits of disturbance and recommended silt fence configuration along with utilizing existing driveway for construction entry.

Check the BMPs you will use:

☐ C105 Stabilized Construction Entrance / Exit

☐ C106 Wheel Wash

☐ C107 Construction Road / Parking Area Stabilization

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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:

If warranted due to heavy rain weather, a sediment trap can be used. The contractor can reach out to us for help with siting and sizing.

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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:

Please see sheet C1.0 for limits of estimated disturbance and erosion control measures like Silt Fence to control sediment transfer toward the north and northwest.

Check the BMPs you will use:

☐ C231 Brush Barrier

☑ C233 Silt Fence

☑ C235 Wattles

☐ C232 Gravel Filter Berm

☐ C234 Vegetated Strip

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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:

Please see sheet C1.0 for erosion control measures. The items below can be utilized as warranted by contractor if necessary.

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

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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:

Silt fence and associated disturbance line is shown near top of existing slope northwest of the house. See sheet C1.0 for reference.

Check the BMPs you will use:

☑ C120 Temporary & Permanent Seeding

☐ C205 Subsurface Drains

☐ C207 Check Dams

☐ C204 Pipe Slope Drains

☐ C206 Level Spreader

☐ C208 Triangular Silt Dike (Geotextile-Encased Check Dam)

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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:

See sheet C1.0 for Erosion Control BMP's.

Check the BMPs you will use:

- ☑ C220 Storm Drain Inlet Protection

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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:

See sheet C1.0 for Erosion Control BMP's.

Check the BMPs you will use:

☐ C202 Channel Lining ☐ C207 Check Dams ☐ C209 Outlet Protection ☑ C235 Wattles

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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

☑ C153 Material Delivery, Storage, and Containment

☐ C152 Sawcutting and Surfacing Pollution Prevention

☐ C154 Concrete Washout Area

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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:

De-watering is likely low probability. During the soil exploration pit excavation (down to 7 feet) no groundwater was observed.

*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

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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:

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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:

See C1.0 for location of "orange construction fencing to protect future infiltration area".

Select the BMPs you will use:

- ☐ C102 Buffer Zone
- ☑ C103 High Visibility Fence
- ☐ C231 Brush Barrier
- ☐ C233 Silt Fence
- ☐ C234 Vegetated Strip

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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	☐ Siting and design criteria provid… 5.13 (**Stormwater Manual** Volum… …hieved. N/A ☐ Lawn and lands… …pe area is on till slopes greater than 33 percent.	This is required on all projects

Roofs		
BMP and Applicable Lists	**Infeasibility Criteria**	**Infeasibility Description and Rationale for Each BMP Not Selected**
Full Dispersion List #1 and #2	☐ Site setbacks and design criteria provided in BMP T5.30 (**Stormwater Manual** Volume V, Section 5.3) cannot be achieved. ☐ A 65 to 10 ratio of fores… …n area to impervious area cannot be a… N/A ☐ A minimum fores… …native vegetation flowpath length of 100 feet (25 feet for sheet flow from a non-native pervious surface) cannot be achieved.	100 LF flowpath is not feasible.
Downspout Full Infiltration List #1 and #2	☐ Evaluation of infiltration is not required per the Infiltration Infeasibility Map due to steep slopes, erosion hazards, or landslide hazards. ☐ Site setbacks and design criteria provided in BMP T5.10A (**Stormwater Manual** Volume III, Section 3.1.1) cannot be achieved. ☐ The lot(s) or site does not have out-wash or loam soils. ☐ 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. ☐ 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.	Infiltration proposed

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)	*Note: Criteria with setback distances are as measured from the bottom edge of the bioretention soil mix.* 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): ☐ Where professional geotechnical evaluation recommends infiltration not be used due to reasonable concerns about erosion, slope failure, or down-gradient flooding. ☐ Within an area whose ground water drains into an erosion hazard, or landslide hazard area. ☐ 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. ☐ Where the only area available for siting does not allow for a safe overflow path to stormwater drainage system or private storm sewer system. ☐ 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. ☐ Where infiltrating water would threaten existing below grade basements. ☐ Where infiltrating water would threaten shoreline structures such as bulkheads. The following criteria can be cited as reasons for infeasibility without further justification (though some require professional services to make the observation): ☐ Evaluation of infiltration is not required per the Infiltration Infeasibility Map due to steep slopes, erosion hazards, or landslide hazards ☐ Within setback provided for BMP T7.30 (**Stormwater Manual** Volume V, Section 7.4) ☐ 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).	N/A 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.)	The following criteria can be cited as reasons for infeasibility without further justification (though some require professional services to make the observation): ☐ Where land for bioretention is within an erosion hazard, or landslide hazard area (as defined by MICC 19.07.060). ☐ Where the site cannot be reasonably designed to locate bioretention areas on slopes less than 8 percent. ☐ Within 50 feet from the top of slopes that are greater than 20 percent and over 10 feet of vertical relief. ☐ For properties with known soil or groundwater contamination (typically federal Superfund sites or state cleanup sites under the Model Toxics Control Act [MTCA]): • Within 100 feet [illegible] known to have deep soil cont[illegible] • [illegible]e 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. ☐ Within 100 feet of a closed or active landfill. ☐ 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. ☐ 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 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.)	The following criteria can be cited as reasons for infeasibility without further justification (though some require professional services to make the observation): ☐ 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 **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 t[illegible]draining soils, a bioretention area wit[illegible]sed to treat pollution-generating surfac[illegible]imum Requirement #6, Runoff Treatment. If the u[illegible]rain is elevated within a base course of gravel, it will also provide some modest flow reduction benefit that will help achieve Minimum Requirement #7. ☐ 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): 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. ☐ 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. ☐ Within 100 feet of a drinking water well, or a spring used for drinking water supply. ☐ 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 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**
Downspout Dispersion Systems List #1 and #2	☐ Site setbacks and design criteria provided in BMP T5.10B (**Stormwater Manual** Volume III, Section 3.1.2) cannot be achieved. ☐ For splash blocks, a vegetated flowpath at least 50 feet in length from the downspout to the down[illegible]line, structure, stream, wetland, slope[illegible]pervious surface is not feasible. ☑ 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.	N/A
Perforated Stub-Out Connections List #1 and #2	☑ Evaluation of infiltration is not required per the Infiltration Infeasibility Map due to steep slopes, erosion hazards, or landslide hazards ☐ 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[illegible]t flows from intersecting the drainfield or where[illegible]ermeability, distance between syste[illegible]is is unnecessary. ☐ Site setbacks and design criteria provided in BMP T5.10C (**Stormwater Manual** Volume III, Section 3.1.3) cannot be achieved. ☐ 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. ☐ The only location available for the perforated stub-out connection is under impervious or heavily compacted soils.	N/A N/A
On-site Detention List #1 and #2	☐ Project discharges directly to Lake Washington. ☐ Findings from a 1/4 mile downstream analysis confirm that the downstream system is free of capacity constraints. ☐ Site setbacks and design criteria provided in the **Stormwater Manual** (Volume III, Section 3.2.2) cannot be achieved.	detention is not proposed due to 100% infiltration proposal

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	☑ Site setbacks and design criteria provided in BMP T5.30 (**Stormwater Manual** Volume V, Section 5.3) cannot be achieved. ☐ A 65 to 10 ratio of f… …ation area to impervious area cannot … ☐ 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.	N/A
Permeable Pavement List #1 and #2	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): ☐ Where professional geotechnical evaluation recommends infiltration not be used due to reasonable concerns about erosion, slope failure, or downgradient flooding. ☐ Within an area whose ground water drains into an erosion hazard, or landslide hazard area. ☐ Where infiltrating and ponded water below the new permeable pavement area would compromise adjacent impervious pavements. ☐ Where infiltrating water below a new… …e pavement area would threaten existing … ☐ Where infiltrating w… …structures such as bulkheads. ☐ Down slope of steep, … …that are likely to deliver sediment. ☐ Where fill soils are used that can become unstable when saturated. ☐ 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. ☐ Where permeable pavements cannot provide sufficient strength to support heavy loads at industrial facilities such as ports. ☐ 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.	N/A infiltration proposed

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.)	The following criteria can be cited as reasons for infeasibility without further justification (though some require professional services to make the observation): ☐ Evaluation of infiltration is not required per the Infiltration Infeasibility Map due to steep slopes, erosion hazards, or landslide hazards ☐ Within an area designated as an erosion hazard, or landslide hazard. ☐ Within 50 feet from the top of slopes that are greater than 20 percent. ☐ For properties with know… …ater contamination (typically fed… …eanup sites under MTCA): • Wit… …o have deep soil cont… • Wher… …g indicates infiltration will likely … …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. ☐ Within 100 feet of a closed or active landfill. ☐ Within 100 feet of a drinking water well, or a spring used for drinking water supply, if the pavement is a pollution-generating surface. ☐ 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. ☐ 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. ☐ At multi-level parking garages, and over culverts and bridges. ☐ 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).	

N/A infiltration proposed

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.)	The following criteria can be cited as reasons for infeasibility without further justification (though some require professional services to make the observation): ☑ Where the site cannot reasonably be designed to have: • Porous asphalt surface < 5% slope • Pervious concrete surface < 10% slope • Permeable interlocking concrete pavement surface < 12% slope • Grid systems < 6-12% slope (check with manufacturer and local supplier to confirm maximum slope) ☐ 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, installation of a 6 inch sand filter layer for treatment as a condition of construction. ☐ Where underlying soils are not adequate for supporting traffic loads when saturated. Soils with a California Bearing Ratio of 5 percent are considered suitable for residential access roads. ☑ 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. ☐ 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.) ☐ 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).	

N/A infiltration proposed

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.)	The following criteria can be cited as reasons for infeasibility without further justification (though some require professional services to make the observation): ☐ At sites defined as "high-use sites" (refer to the Glossary in the **Stormwater Manual** Volume I) ☐ In areas with "indu… 0 CFR 122.26(b)(14). ☐ Where the risk of co… ore likely such as gas stations, truck st… rage sites. ☐ Where routine, heavy … applications of sand occur in frequent snow zones to maintain traction during weeks of snow and ice accumulation. ☐ 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. N/A infiltration proposed	
Bioretention or Rain Gardens List #1 (both) and List #2 (bioretention only)	*Note: Criteria with setback distances are as measured from the bottom edge of the bioretention soil mix.* 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): ☐ Where professional geotechnical evaluation recommends infiltration not be used due to reasonable concerns about erosion, slope failure, or down-gradient fl… ☐ Within an area … an erosion hazard, or landslide haza… ☐ Where the only ar… reaten the safety or reliability of pre… and utilities, pre-existing underground storag… nks, pre-existing structures, or pre-existing road or parking lot surfaces. ☑ Where the only area available for siting does not allow for a safe overflow pathway to stormwater drainage system or private storm sewer system. ☐ 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. ☐ Where infiltrating water would threaten existing below grade basements. ☐ Where infiltrating water would threaten shoreline structures such as bulkheads. N/A infiltration proposed	

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.)	The following criteria can be cited as reasons for infeasibility without further justification (though some require professional services to make the observation): ☐ Where evaluation of infiltration is not required per the Infiltration Infeasibility Map due to steep slopes, erosion hazards, or landslide hazards. ☐ Within setback provided for BMP T7.30 (**Stormwater Manual** Volume V, Section 7.4) ☐ 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). ☐ Where land for bioretention is within an erosion hazard, or landslide hazard area (as defined by MICC 19.07.060). ☐ Where the site cannot be rea… to locate bioretention areas on slopes l… ☐ Within 50 feet fro… eater than 20 percent and over 10 feet o… ☐ For properties with … dwater contamination (typically federal Su… and sites or state cleanup sites under the Model Toxics Control Act [MTCA]): • 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. ☐ Within 100 feet of a closed or active landfill. ☐ 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.	

N/A infiltration proposed

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.)	The following criteria can be cited as reasons for infeasibility without further justification (though some require professional services to make the observation): ☐ 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. ☐ 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 **Stormwater Manual** Volume III, Section 3.3.6 (or an alternative small scale PIT specified by the City) shall be used to demonstrate bioretention areas. If the measured native soil rate is less than 0.30 in/hour, bioretention/rain garden sites are required to be evaluated as an option in draining soils, a bioretention area may be used to treat pollution-generating surfaces for 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. N/A infiltration proposed ☐ 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): 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. ☐ 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 ☐ Within 100 feet of a drinking water well, or a spring used for drinking water supply. ☐ 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

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	☐ Site setbacks and design criteria provided in BMP T5.12 (**Stormwater Manual** Volume V, Section 5.3) cannot be achieved. ☐ Positive drainage for sheet f… …ot be achieved. ☐ Area to be disp… …nnot be graded to have less than a 15 p… ☑ For flat to model… …a 10 foot-wide vegetation buffer for dispers… …djacent 20 feet of contributing surface cannot be achieved. For variably sloped areas, at least a 25 foot vegetated flowpath between berms cannot be achieved.	
Concentrated Flow Dispersion List #1 and #2	☑ Site setbacks and design criteria provided in BMP T5.11 (**Stormwater Manual** Volume V, Section 5.3) cannot be… …ed. ☐ A minimum 3 foot … …flowpath OR a dispersion trench ar… …00 square feet of drainage area follow… …nnot be achieved. ☐ More than 700 square… …ms to any dispersion device.	
On-site Detention List #1 and #2	☐ Project discharges directly to Lake Washington. ☐ Findings from a 1/4 mile downstream an… …onfirm that the downstream system is free… …ts. ☐ Site setbacks and d… …**tormwater Manual** (Volume III, Section…	

N/A infiltration proposed

N/A infiltration proposed

N/A infiltration proposed

CITY OF MERCER ISLAND

SECTION D: POST-CONSTRUCTION SOIL MANAGEMENT

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

- [x] Site Plan showing, to scale:
  - [x] Areas of undisturbed native vegetation (no amendment required)
  - [x] New planting beds (amendment required)
  - [x] New turf areas (amendment required)
  - [ ] Type of soil improvement proposed for each area

(see C2.0)

- [ ] Soil test results (required if proposing custom amendment rates)
- [ ] 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: compost-amended soil	31 CY	10 % organic matter 18 C:N ratio "Stable"? yes ☑ no ☐
Product #2: _____	_____ CY	_____ % organic matter _____ C:N ratio "Stable"? yes ☐ no ☐
Product #3: _____	_____ CY	_____ % organic matter _____ C:N ratio "Stable"? yes ☐ no ☐

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		
☑ Amend with compost	Turf: 4,000 SF x 5.4 CY ÷ 1,000 SF = 21.6 CY Planting beds: 5,500 SF x 9.3 CY ÷ 1,000 SF= 51.2 CY Total Quantity = 72.8 CY Scarification depth: 8 inches	Product: compost-amended soil
☐ 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: _____
☐ 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		
☐ 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: _____
☐ 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		
☐ Amend with compost	Planting beds: _____ SF x 12.4 CY ÷ 1,000 SF= _____ CY Total Quantity = _____ CY	Product: _____
☐ Stockpile and amend	Planting beds: _____ SF x 12.4 CY ÷ 1,000 SF= _____ CY Total Quantity = _____ CY	Product: _____
☐ Topsoil import	Planting beds: _____ SF x 12.4 CY ÷ 1,000 SF= _____ CY Total Quantity = _____ CY	Product: _____

N/A

N/A

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:

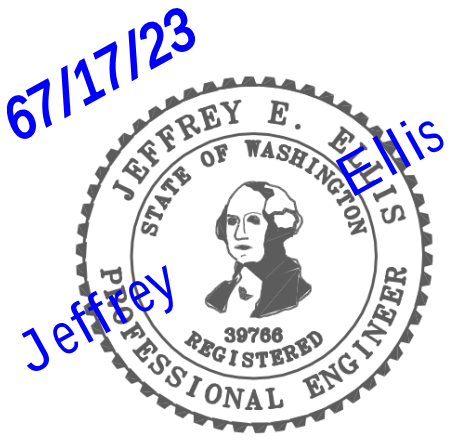
"I hereby state that this Construction Stormwater Pollution Prevention Plan for Home #472 by MN Custom *(name of project)* *has been prepared by me or under my supervision and meets the standard of care and expertise which is usual and customary in this community for professional engineers. I understand 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: Home Project 472 LLC

Applicant Signature: Duffy Ellis, PE (behalf of owner) Date July 2023



MN Custom Homes, LLC
3009 112th Ave NE, Suite 100
Bellevue, WA 98004

Attention: Eric Sadler

Subject: Subsurface Exploration, Geologic Hazards Assessment, and Soil Design Recommendations
MN 472 –7119 80th Avenue SE, Mercer Island, Washington

Mr. Sadler:

At your request, South Fork Geosciences has logged the existing subsurface soil explorations on the subject property and performed laboratory soil testing on representative soils samples. The purpose of this study is to provide site-specific soils and geologic information to assess potential geologic hazards and to provide the geotechnical design elements for the proposed development, which consists of demolition of the existing home and construction of a new single-family residence on the subject property.

General Site Conditions
The subject property was rectangular in shape and based on the King County Assessors information the property was 0.34 acres (14,753 square feet) in size. The property sloped gently from the southeast to the northwest and based on visual estimates and available topographic information, the total relief of the property was on the order of 10 feet. There was an existing home in the center of the property with driveways providing access to both SE 72nd Street and 80th Avenue SE. The property was landscaped in a manner consistent with the era of construction (1961). The property was bordered by SE 72nd Street to the south, 80th Avenue SE to the east, and by other residential properties in other directions. We did not observe any signs of standing water, soil settlement, or accelerated erosion during our site reconnaissance.

Soil Conditions/Geologic Setting
South Fork Geosciences was onsite on June 5, 2023 to observe a soil exploration pit (EP-1) excavated with a subcontracted excavator provided by Northwest Trucking and Excavating Co. Inc. We interpret the native soils encountered to be Vashon recessional outwash and Vashon lodgement till sediments. Our geologic interpretation does not agree with the referenced geologic map (Troost & Wisher, 2006) which indicates the surface geology to be Vashon lodgement till. Recessional outwash sediments commonly overlie lodgement till in localized deposits that are not found in regional scale mapping and we attribute our different interpretation to the site-specific nature of our study.

Stratigraphy
<u>Fill</u>
Soils that we interpret to be fill soils were encountered in EP-1 from the ground surface to 2 feet. Structures should not be founded on existing fill soils, but if the new home is located near

the center of the property similar to the location of the existing home, we do not anticipate that significant fill soils will be encountered.

Vashon Recessional Outwash

Underlying the fill soils, sediments we interpret as Vashon recessional outwash were encountered from 2 to 5.5 feet below the ground surface. Recessional outwash sediments often overlie Vashon lodgement till and advance outwash sediments in localized deposits that are below mapping scale. Vashon recessional outwash sediments were deposited in fluvial and lacustrine environments as the Vashon glacial ice sheet receded. These sediments are normally consolidated and are relatively permeable when they have low silt and clay content. The recessional outwash soils encountered are suitable for foundation support.

Vashon Lodgement Till

Vashon lodgement till soils were underlying the recessional outwash soils from 5.5 feet below the ground surface to the total depth explored (7 feet). Vashon lodgement till sediments are a poorly sorted (well graded) mixture of boulders, gravel, sand, silt, and clay that was deposited at the sole of the Vashon glacial ice sheet as the glacial ice advanced. These sediments were overconsolidated by the glacial ice and they are typically dense to very dense and have low permeability. These soils are also suitable for foundation support.

Groundwater Conditions

We did not observe groundwater in the exploration pits performed for this study. Based on our exploration and the topography on and around the subject property, it is our opinion that groundwater will not adversely affect project design.

Geologic Hazards Assessment

Based on our review of relevant geologic resources, the geologic hazard layers in the Mercer Island GIS Portal, the Mercer Island City Code, and our site reconnaissance, there were no conditions present that constitute geologic hazards. As such, there are not any buffers or setbacks to be applied or any other special mitigation for geologic hazards for the proposed development.

Soil Design Recommendations

Soil Design Recommendations Summary

Based the subsurface information obtained, it is our opinion that the native Vashon recessional outwash and lodgement till soils are suitable for support of conventional spread footing foundations and structural fills. For ease of reference, the site-specific soil design values we have determined are shown below:

- Allowable soil bearing capacity of native soils or structural fill over native soils = 2,000 pounds per square foot
- Coefficient of Friction = 0.35
- Passive Equivalent Fluid Pressure = 250 pounds per cubic foot
- Seismic Site Class = C

The above values are allowable and include appropriate factors of safety. This information is presented in more detail in the following sections and these sections should be read to understand the proper context.

Site Preparation and Site Grading

It is likely that structural fill soils will be required to establish grades for the project. Any fill soil placed beneath a foundation, retaining wall, or driveway/parking area must be constructed as a structural fill. In areas that will provide structural support, any existing fill soils or loose soils should be removed and replaced with structural fill as described below.

Structural fill is defined as non-organic soil, placed in horizontal loose lifts, with each lift being compacted to at least 95 percent of the maximum dry density, using the modified Proctor test (ASTM: D1557) as the standard. Prior to placing any structural fill, the exposed soils must either be undisturbed or be compacted to a dense, non-yielding condition and be approved for structural fill placement. In the case of utility trench filling, the backfill should be placed and compacted in accordance with the applicable municipal or utility company standards.

Fill soils should be predominantly free of organics and other deleterious material and should be appropriately moisture conditioned when placed and compacted. Placement and compaction of the structural fill should be monitored by a competent field technician. In situ density testing should be performed during fill placement to verify proper compaction of the fill soil. A sample of the planned structural fill soil will need to be available at least 48 hours prior to compaction verification testing for laboratory analysis.

Foundations

Spread footings founded on medium dense or denser native soils or structural fill (95 percent maximum dry density as determined by Modified Proctor ASTM: D1557) placed atop the native soils may be designed using an allowable bearing pressure of 2,000 pounds per square foot (psf), including both dead and live loads. An increase of one-third may be used for short-term wind or seismic loading. All footings must penetrate to the prescribed bearing stratum, and no footing should be founded in or above loose, organic, or existing fill soils.

Anticipated settlements of spread footings designed as described above may be on the order of ½-inch over the expected lifespan of the structure. Loose or disturbed surface soils, excessive moisture present, or poor foundation subgrade preparation could result in larger settlements.

Lateral Resistance

Lateral loads can be resisted by friction between the foundation and the supporting soils, and/or by passive earth pressure acting on the buried portions of the foundations. The spread footings must be backfilled with structural fill compacted to a dense, non-yielding condition to achieve the passive resistance provided below. The structural fill must extend horizontally outward from the embedded portion of the foundation a distance equal to at least three times the embedment depth over which the passive resistance is applied. We recommend the following design parameters:

- Passive equivalent fluid = 250pounds per cubic foot
- Coefficient of friction = 0.35

The above values are allowable and include appropriate factors of safety.

Seismic Design Considerations

The subject property is not a seismic hazard area, and no special mitigation is required. The following subsections will address the potential risks associated with a seismic event with respect to project design:

In general, there are four elements of hazard associated with large seismic events: ground rupture; seismically induced landslides; liquefaction; and ground motion. The potential for these phenomena to impact the subject property is discussed below.

Ground Rupture

Most large earthquakes in the Puget Sound area are sub-crustal events with epicenters ranging from 50 to 70 kilometers in depth. Based on our review of the USGS Quaternary Fault Map, the subject property lies within the Seattle Fault Zone (SFZ), with two mapped fault strands just south of the subject property. These fault strands are mapped as "moderately constrained location" and surface fault exposure was not mapped on the referenced geologic map. (Troost & Wisher, 2006). Also, research has estimated the recurrence interval on some fault strands of the SFZ to be on the order of 200 to 12,000 years (Johnson, et al., 2016). Based on the lack of evidence of past ground rupture in the immediate vicinity of the subject property, the estimated recurrence interval of the fault strands, and the surficial glacial sediments overlying the bedrock geology, it is our opinion that the probability of ground surface rupture impacting the subject property is low, and no mitigations are necessary.

Seismically Induced Landslides

Due to the flat to gently sloping site conditions on and adjacent to the subject property and the relatively dense native soils present, it is our opinion that the potential for landslides to affect the subject property is very low. No mitigation is necessary.

Liquefaction

Liquefaction is a condition where loose, saturated, fine sands lose their shear strength due to rapid pore pressure build-up when subjected to high intensity cyclic loads that can occur during earthquakes. Due to the unsaturated, medium dense recessional outwash and dense lodgement till soils present, it is our opinion that the liquefaction potential is negligible, and no mitigations are necessary.

Ground Motion

Seismic hazards that will affect the structure would likely be due to the intensity and duration of the ground shaking. The structural design of the project should be consistent with 2018 International Building Code (2018 IBC) guidelines (Section 1613). Based on our estimation of soil properties at depth utilizing available geologic data, Site Class "C" may be used for the design of the project, as defined by ASCE 7 "Minimum Design Loads for Buildings and Other Structures", Chapter 20.

Retaining Walls

Due to the flat to gently sloping topography we do not anticipate that significant retaining walls will be needed for this project. If proposed, South Fork Geosciences should be contacted to review any cast-in-place concrete retaining walls, segmental block walls, or rockeries that are greater than 4 feet in height.

Floor Support

We anticipate that the new home will utilize a combination of slab-on-grade floors and structural/crawl space-type floors. Slab-on-grade concrete floors should be cast atop native soils or structural fill soils. A capillary break layer with a minimum thickness of 4 inches should be placed atop the prepared soil subgrade. The capillary break material should be a gap graded material consisting of pea gravel, ¾-inch washed drain rock, or clean crushed rock with less than 5 percent fines (material passing the No.200 sieve). The capillary break will reduce the potential for moisture wicking through the floor slab. A 10-mil thick plastic vapor barrier should also be placed atop the capillary break material. All concrete placement should follow the guidelines set forth by the American Concrete Institute (ACI). In areas where structural/crawl space-type floors are used the soil surface should be covered with a minimum 10-mil thick moisture barrier.

Drainage Considerations

Foundation Drainage

A perimeter foundation drain should be established to protect the floor slab and internal crawlspace areas from ground water intrusion. The level of the foundation drain should be set at, or slightly below, the base of the footing elevation. The drain should consist of 4-inch diameter, rigid, perforated, PVC drainpipe and should be set to allow for gravity discharge. The drainpipe should be surrounded by a minimum of 6 inches of pea gravel or washed drain rock. Roof drains should not tie into the footing drain but should be collected in a separate, tightline drain. The foundation drain should be set to discharge via gravity to a dispersion pad on the ground surface or to stormwater conveyance. As a standard of practice exterior grades should slope slightly away from foundations.

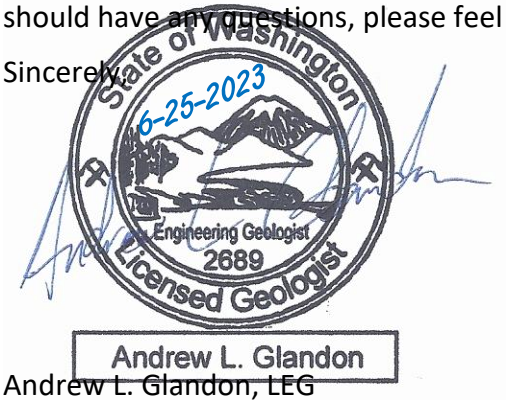
Site Drainage/Stormwater Management

Based on our correspondence with the project civil engineer (Civil Engineering Solutions), there are several options for the stormwater drainage design for the project. South Fork Geosciences will coordinate with the civil engineer and provide relevant soil information and soil testing for the drainage design. This information and testing will be provided in a supplemental document at a later time.

Closure

We trust that this information will aid in the design and permitting of your project. If you should have any questions, please feel free to contact us.

Sincerely,



Andrew L. Glandon, LEG
Engineering Geologist / Owner
South Fork Geosciences, PLLC

Attachments: Soil Exploration Location
Soil Exploration Pit Log
Grain Size Analyses (2 Pages)

References:

"Geologic Map of Mercer Island, Washington", by Kathy G. Troost & Aaron P. Wisher, October 2006, Scale 1:12,000

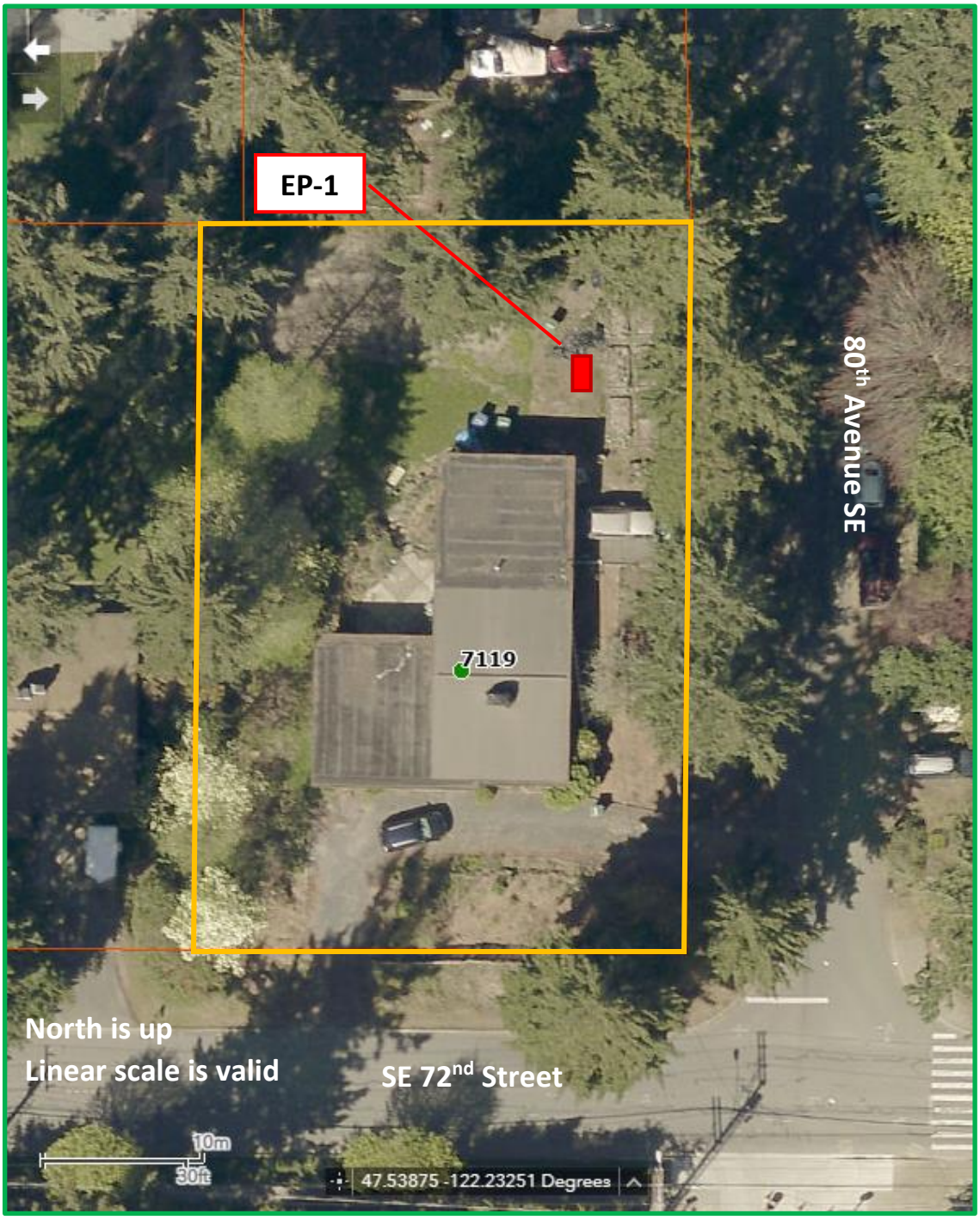
Washington Geologic Information Portal

U.S. Quaternary Faults (arcgis.com)

City Code | Mercer Island, WA | Municode Library

City of Mercer GIS Portal (mercergov.org)

King County Department of Assessments: TPN 9159700050



Source: King County iMap

Soil Exploration Location

Soil Exploration Log

EP-1 **6-5-2023**

	Grass at surface
0-2ft	medium dense, damp, light brown-gray fine to medium SAND with gravel and silt, some roots (SP-SM) [Fill] • Thin paleosol observed at 2 feet
2-5.5	medium dense, damp, light brown fine to medium SAND trace gravel, trace silt (SP) [Vashon Recessional Outwash]
5.5-7ft	dense, damp, gray silty fine to medium SAND with gravel (SM) [Vashon Lodgement Till] • Near zero air voids
Total Depth = 7 feet	No groundwater seepage observed. No caving observed. Sampled at 3.5 and 7 feet.

Professional Service Industries, Inc.
16750 Woodinville Redmond Rd NE Ste 102
Woodinville, WA 98072

Phone: (425) 409-2504

Report No: MAT:07122272-79-S1
Issue No: 1

Material Test Report

Client: SOUTH FORK GEOSCIENCES PLLC
PO BOX 1275
NORTH BEND, WA 98045

CC: ANDY GLANDON

Project: SOUTH FORK GEOSCIENCES T&M
SEATTLE, WA

Approved Signatory: Deborah Priest (Senior Project Engineer)
Date of Issue: 6/9/2023

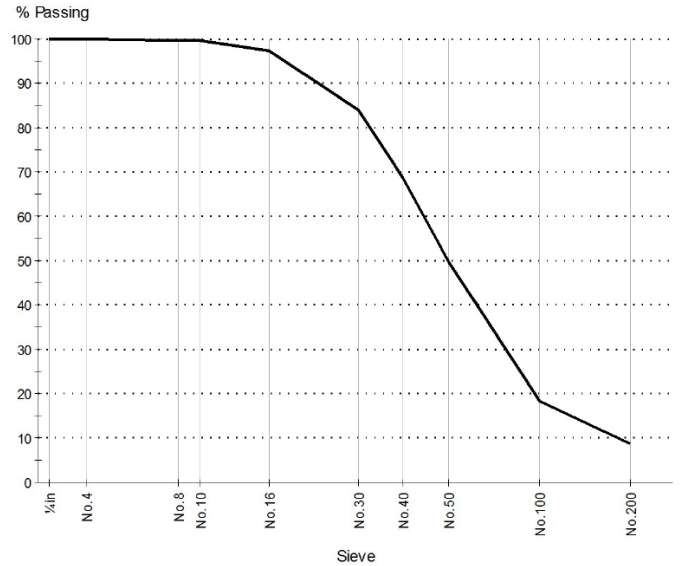
Sample Details

Sample ID:	07122272-79-S1
Client Sample ID:	
Date Sampled:	06/05/23
Sampled By:	Client
Specification:	no specifications
Supplier:	
Source:	
Material:	
Sampling Method:	Stockpile/Trans - ASTM D 75 - 5.3.3
Soil Description:	fine brown soil
General Location:	MN 472 EP-1 -3.5 feet
Location:	MN 472 EP-1 -3.5 feet

Sample Description:

fine brown soil

Particle Size Distribution



COBBLES	GRAVEL		SAND			FINES (8.7%)	
(0.0%)	Coarse (0.0%)	Fine (0.1%)	Coarse (0.3%)	Medium (30.9%)	Fine (60.0%)	Silt	Clay

Grading: ASTM C 136, ASTM C 117

Drying By: Oven
Date Tested: 6/9/2023
Tested By: Kurtis Wahl

Sieve Size	% Passing	Limits
¼in (6.3mm)	100.0	
No.4 (4.75mm)	99.9	
No.8 (2.36mm)	99.7	
No.10 (2.0mm)	99.6	
No.16 (1.18mm)	97.5	
No.30 (600µm)	84.1	
No.40 (425µm)	68.7	
No.50 (300µm)	49.6	
No.100 (150µm)	18.2	
No.200 (75µm)	8.7	

D85: 0.6279 **D60:** 0.3626 **D50:** 0.3022
D30: 0.1946 **D15:** 0.1188 **D10:** 0.0825
Cu: 4.40 **Cc:** 1.27

Professional Service Industries, Inc.
16750 Woodinville Redmond Rd NE Ste D102
Woodinville, WA 98072

Phone: (425) 409-2504

Material Test Report

Report No: MAT:07122272-79-S2
Issue No: 1

Client: SOUTH FORK GEOSCIENCES PLLC
PO BOX 1275
NORTH BEND, WA 98045

CC: ANDY GLANDON

Project: SOUTH FORK GEOSCIENCES T&M
SEATTLE, WA

Approved Signatory: Deborah Priest (Senior Project Engineer)
Date of Issue: 6/9/2023

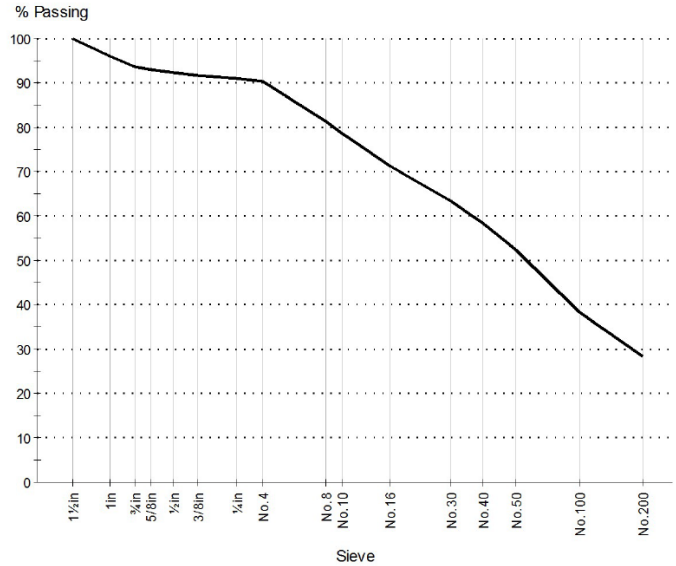
Sample Details

Sample ID:	07122272-79-S2
Client Sample ID:	
Date Sampled:	06/06/23
Sampled By:	Client
Specification:	no specifications
Supplier:	
Source:	
Material:	
Sampling Method:	Stockpile/Trans - ASTM D 75 - 5.3.3
Soil Description:	grey silty soil with rock
General Location:	MN 472 EP-1 -7 feet
Location:	MN 472 EP-1 -7 feet

Sample Description:

grey silty soil with rock

Particle Size Distribution



COBBLES	GRAVEL		SAND			FINES (28.2%)	
(0.0%)	Coarse (6.3%)	Fine (3.4%)	Coarse (11.5%)	Medium (20.5%)	Fine (30.0%)	Silt	Clay

Grading: ASTM C 136, ASTM C 117

Drying By: Oven
Date Tested: 6/9/2023
Tested By:

Sieve Size	% Passing	Limits
1½in (37.5mm)	100.0	
1in (25.0mm)	95.9	
¾in (19.0mm)	93.7	
5/8in (16.0mm)	92.9	
½in (12.5mm)	92.5	
3/8in (9.5mm)	91.8	
¼in (6.3mm)	91.1	
No.4 (4.75mm)	90.3	
No.8 (2.36mm)	81.4	
No.10 (2.0mm)	78.7	
No.16 (1.18mm)	71.4	
No.30 (600µm)	63.5	
No.40 (425µm)	58.2	
No.50 (300µm)	52.2	
No.100 (150µm)	38.4	
No.200 (75µm)	28.2	

D85: 3.1318 **D60:** 0.4778 **D50:** 0.2686
D30: 0.0848 **D15:** N/A **D10:** N/A