CITY OF MERCER ISLAND

DEVELOPMENT SERVICES GROUP

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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: Strand Property

Site Address: 6950 SE Maker St.

Total Lot Size: 8,750

Total Proposed Area to be Disturbed (including stockpile area): 7,000 sq ft

Total Volume of Proposed Cut and Fill: 190 sq ft

Total Proposed New Hard Surface Area: 65 sq ft

Total Proposed Replaced Hard Surface Area: 2,736 sq ft

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

Net Increase in Impervious Surface: -2,222 (Proposed = 3,537 sf - Existing = 5,759 sf) 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:

See Attached Drainage Report and Downstream Analysis

Calculate new or replaced areas by surface type:

Lawn or Landscape Areas: 3,912 sq ft	Roof Area: 1,808 sq ft

Other Hard Surface Areas:

Driveway: 1091 sq ft Patio: 91 sq ft Sidewalk: _____ sq ft

Parking Lot: _____ sq ft Other: 98 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

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:

☐ No source control BMPs are applicable for this project.

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SECTION A: SMALL PROJECT STORMWATER SITE PLAN/REPORT

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:

Under existing conditions the site drains to the stormwater system in SE Maker St. This will remain unchanged following site development. See Attached Drainage Report and Downstream Analysis for additional details.

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

Additional Comments:

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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: Site Mapped as Infil Infeasible 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):

The site runoff is reduced following development and the downstream system does not have any capacity constraints prior to discharging to Lake Washington. (see attached drainage report and downstream analysis).

The site is mapped as infiltration infeasible and cannot meet the design requirements for dispersion BMPs.

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SECTION A: SMALL PROJECT STORMWATER SITE PLAN/REPORT

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: Site Mapped as Infil Infeasible _____ 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):

The site runoff is reduced following development and the downstream system does not have any capacity constraints prior to discharging to Lake Washington. (see attached drainage report and downstream analysis).

The site is mapped as infiltration infeasible and cannot meet the design requirements for dispersion BMPs.

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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SECTION A: SMALL PROJECT STORMWATER SITE PLAN/REPORT

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:

The site is mapped as infiltration infeasible and cannot meet the design requirements for dispersion BMPs.

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:

The site runoff is reduced following development and the downstream system does not have any capacity constraints prior to discharging to Lake Washington. (see attached drainage report and downstream analysis).

The site cannot meet the design requirements for dispersion BMPs.

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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:

See Attached Drainage Report and Downstream Analysis

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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.
- [x] North arrow.
- [x] Existing structures and roads.
- [ ] Boundaries and identification of different soil types.
- [x] Areas of potential erosion problems.
- [ ] 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.
- [x] Where feasible, contours extend a minimum of 25 feet beyond property lines and extend sufficiently to depict existing conditions.
- [x] 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.
- [x] Existing unique or valuable vegetation and vegetation to be preserved.
- [x] Cut-and-fill slopes indicating top and bottom of slope catch lines.
- [x] Total cut-and-fill quantities and the method of disposal for excess material.
- [x] Stockpile; waste storage; and vehicle storage, maintenance, and washdown areas.

Temporary and Permanent BMPs

Include the following on site map (where applicable):

- [x] 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.
- [x] 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).
- [x] 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:

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:

Silt Fence will be installed around the site perimeter to function as a hig visibility fence and to provide sediment control. See Sheet C-1.

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:

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

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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:

Given the size of the development the use of the BMPs to control runoff flow rates is not warranted.

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:

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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:

Silt Fence will be installed around the site perimeter to function as a hig visibility fence and to provide sediment control. See Sheet C-1.

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:

See TESC Plan C-1 and C-2 for soil ammendment

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:

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:

Inlet protection will be provided at both catch basins located in the adjacent right-of-way.

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:

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

☑ C152 Sawcutting and Surfacing Pollution Prevention

☑ C153 Material Delivery, Storage, and Containment

☑ C154 Concrete Washout Area

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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

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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:

On-site BMPs are not feasible for this project.

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 provided in BMP T5.13 (**Stormwater Manual** Volume V, Section 5.3) cannot be achieved. ☐ 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	☐ 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 forested or native vegetation area to impervious area cannot be achieved. ☐ 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.	No native veg. is located on-site and the developed impervious area is 40%.
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.	Site is mapped as infeasible for infiltration.

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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 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. 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).	

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 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. ☐ 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.	

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 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. ☐ 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

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 downstream property line, structure, stream, wetland, slope over 15 percent, or other impervious 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.	Flow path length and slope requirements cannot be met for dispersion BMPs.
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 prohibit flows from intersecting the drainfield or where site conditions (soil permeability, distance between systems, etc.) indicate that this 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.	Site is mapped as infeasible for infiltration.
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.	Site drains to closed conveyance system with adequate capacity. See attached downstream analysis.

00305

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 forested or native vegetation area to impervious area cannot be achieved. ☐ 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.	No native veg. is located on-site and the developed impervious area is 40%.
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 permeable pavement area would threaten existing below grade basements. ☐ Where infiltrating water would threaten shoreline structures such as bulkheads. ☐ Down slope of steep, erosion prone areas 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.	

00306

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 known soil or groundwater contamination (typically federal Superfund sites or state cleanup sites under 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 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).	Site is mapped as infeasible for infiltration.

00307

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, the city may approve installation of a 6 inch sand filter layer meeting city specifications for treatment as a condition of construction. ☐ 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. ☐ 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).	

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 "industrial activity" as identified in 40 CFR 122.26(b)(14). ☐ Where the risk of concentrated pollutant spills is more likely such as gas stations, truck stops, and industrial chemical storage 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.	
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 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.	

00309

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 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 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.	Site is mapped as infeasible for infiltration. See attached figure.

00310

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 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. ☐ 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.	

00311

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 flow runoff cannot be achieved. ☐ Area to be dispersed (e.g., driveway, patio) cannot be graded to have less than a 15 percent slope. ☐ For flat to moderately sloped areas, 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.	Flow Path and slope requirements cannot be met for dispersion BMPs.
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 achieved. ☐ 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. ☐ More than 700 square feet drainage area drains to any dispersion device.	Flow Path and slope requirements cannot be met for dispersion BMPs.
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.	Site drains to closed conveyance system with adequate capacity. See attached downstream analysis.

00312

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:
  - [ ] Areas of undisturbed native vegetation (no amendment required)
  - [ ] New planting beds (amendment required)
  - [x] New turf areas (amendment required)
  - [x] Type of soil improvement proposed for each area
- [ ] 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: _____	21 _____ CY	_____ % organic matter _____ 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

00313

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 # 3,912 (should match identified Area # on Site Plan)

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

Pre-Approved Amendment Method		
☐ 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: _____
☑ Stockpile and amend	Turf: 3,912 SF x 5.4 CY ÷ 1,000 SF = 21 CY Planting beds:_____ SF x 9.3 CY ÷ 1,000 SF= _____CY Total Quantity = _____CY Scarification depth: 8 inches	21 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: _____

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

00314

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 6950 SE Maker St. *(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)

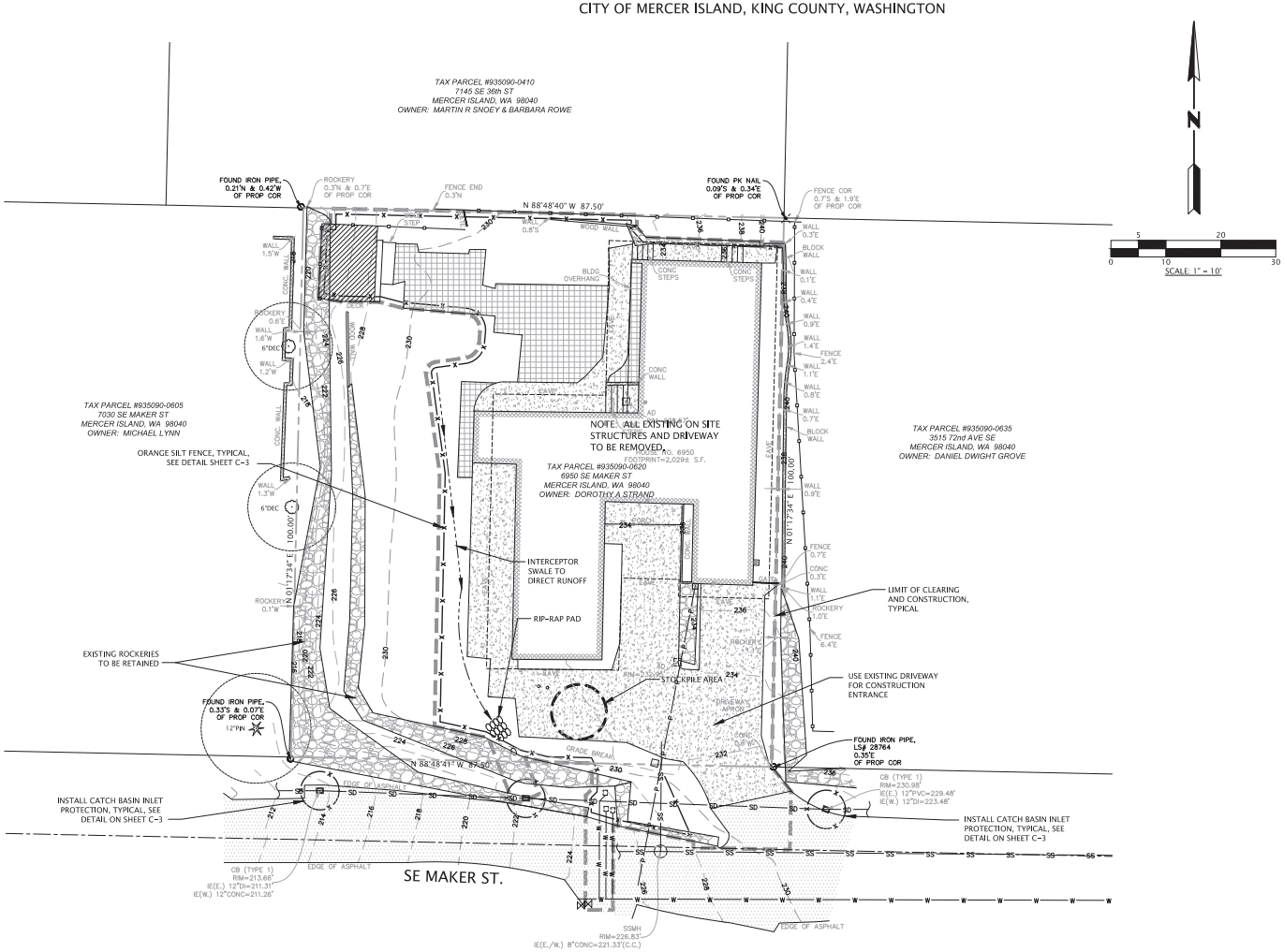
I have read and completed the Stormwater Submittal Package and know the information provided to be true and correct.

Print Applicant Name: Mark Barber P.E.

Applicant Signature: _____ Digitally signed by Mark Barber Date: 2022.07.10 14:23:46-07'00' Date 07/10/2022

00315

NW ¼, SW ¼ SECTION 12, TOWNSHIP 24 N, RANGE 4 E, W.M.
CITY OF MERCER ISLAND, KING COUNTY, WASHINGTON



LEGEND

- AREA DRAIN
- ASPHALT SURFACE
- BUILDING
- CENTERLINE ROW
- COLUMN
- CONCRETE SURFACE
- RETAINING WALL
- DECK
- FENCE LINE (WOOD)
- GAS METER
- INLET (TYPE 1)
- MONUMENT IN CASE (FOUND)
- MONUMENT (SURFACE, FOUND)
- NAIL AS NOTED
- PAVER SURFACE
- POWER METER
- POWER (OVERHEAD)
- ROCKERY
- SEWER LINE
- SEWER MANHOLE
- STORM DRAIN LINE
- SEWER CLEANOUT
- TREE (AS NOTED)
- WATER LINE
- WATER METER
- WATER VALVE

LEGEND (EROSION)

- EXISTING CONTOUR LINE
- PROPOSED CONTOUR LINE
- PROPOSED SILT FENCE
- PROPOSED LIMIT OF CONSTRUCTION
- PROPOSED CATCH BASIN INSERT
- EXISTING TREE TO BE RETAINED
- EXISTING TREE TO BE REMOVED
- TREE PROTECTION

SURVEY NOTE

EXISTING SURVEY INFORMATION SHOWN HEREON IS BASED ON SURVEY BY TERRANE SURVEYING & MAPPING, AND ELECTRONIC DRAWING FILES AS PROVIDED ON 03/25/2022. SURVEY INFORMATION HAS NOT BEEN FIELD VERIFIED BY GOLDSMITH.

811 Know what's below. Call before you dig.

00316

GOLDSMITH
LAND DEVELOPMENT SERVICES

PLOTTED: 2022/07/10 13:46 MBARBER
DRAWN:
DESIGNED:
APPROVED:
FIELD BOOK:
PAGE #:

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KEITH J. GOLDSMITH — STATE OF WASHINGTON — 24597 — REGISTERED PROFESSIONAL ENGINEER

7/10/2022

MARK A. BARBER — STATE OF WASHINGTON — 22000 — REGISTERED PROFESSIONAL ENGINEER

DOROTHY STRAND

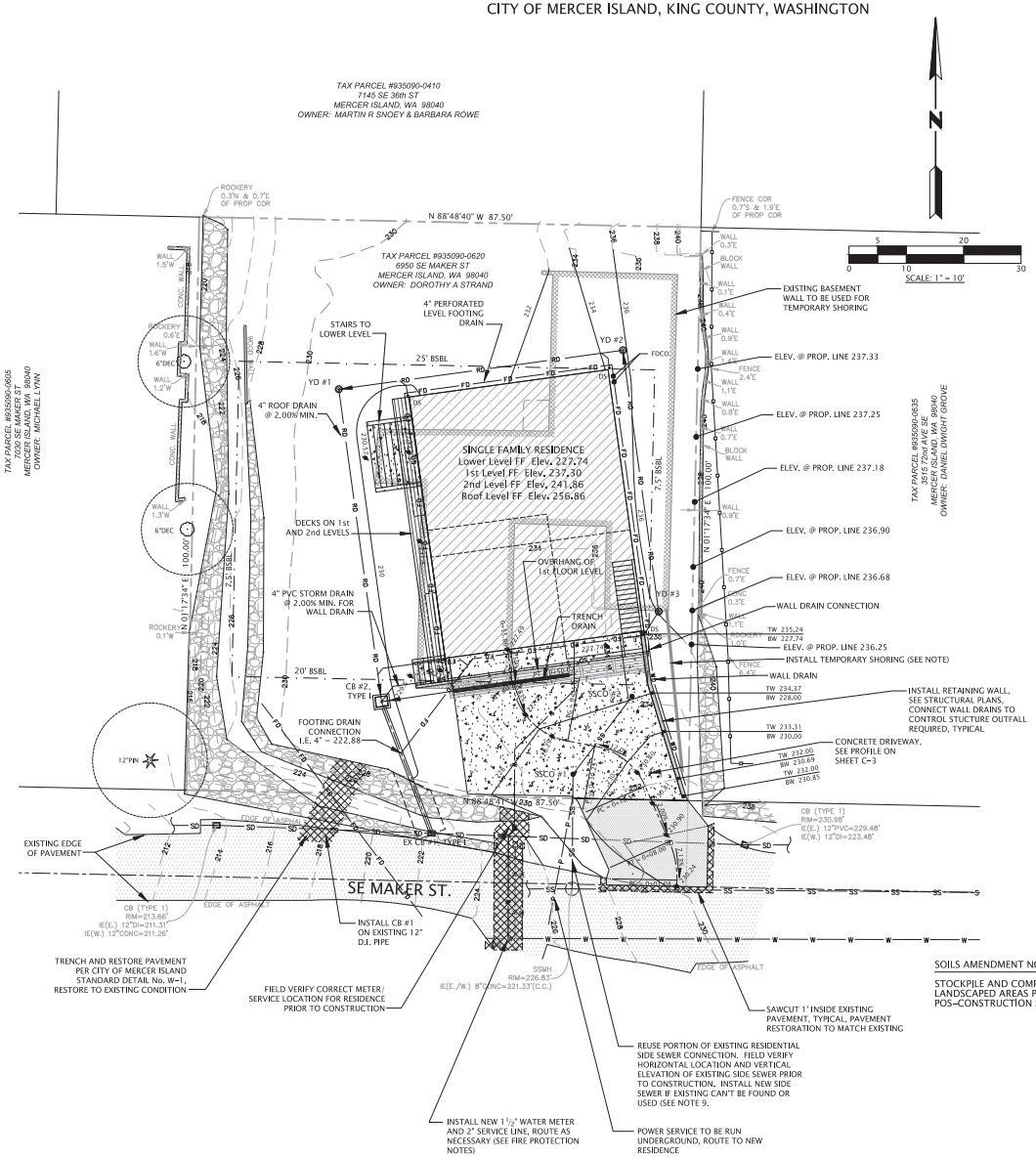
JOB NO. 22038

SHEET C-1

TESC PLAN
FOR
STRAND PROPERTY

6950 SE MAKER ST., CITY OF MERCER ISLAND KING COUNTY, WASHINGTON

NW ¼, SW ¼ SECTION 12, TOWNSHIP 24 N, RANGE 4 E, W.M.
CITY OF MERCER ISLAND, KING COUNTY, WASHINGTON



STORM/ROOF DRAINAGE SYSTEM

EXISTING DOWNSTREAM CB, TYPE I
RIM = 213.66
I.E. 12" CONC. (W) = 211.26
I.E. 12" D.I. (E) = 211.31

EX. 38 LF 12" D.I. SD @ 25.10%

EX. CB # 1, TYPE I
RIM = 223.33
I.E. 12" D.I. (W & E) = 220.83
I.E. 6" PVC (N) = 221.33

24 LF 6" PVC SD @ 15.70%

CB #2, TYPE I
SOLID LID = 230.00
I.E. 4" (N)= 225.10
I.E. 4" (E) = 226.50 (FROM TRENCH DRAIN)
I.E. 4" (NE) = 225.10 (FROM WALL DRAIN)
I.E. 6" (S) = 225.10

55 LF 4" PVC RD @ 3.45%

YD #1
RIM = 230.00
I.E. 4" = 227.00

50 LF 4" PVC RD @ 10.00%

YD #2
RIM = 235.50
I.E. 4" = 232.00

46 LF 4" PVC RD @ 2.17%

YD #3
RIM = 236.00
I.E. 4" = 233.00

TRENCH DRAIN TO CB #2
13 LF 4" PVC RD @ 3.08%

TRENCH DRAIN
GRATE = 227.40
I.E. 4" = 226.90

SANITARY SEWER

EXISTING SSMH
RIM = 226.93
I.E. 8" CONC. (E) = 221.33
I.E. 8" CONC. (W) = 221.33
I.E. 6" SS (N) = 221.91 (ASSUMED)

EX. 20 LF 6" SS @ 2.00 (ASSUMED)

SSCO #1
RIM = 228.89
I.E. 6" SS = 222.31

16 LF 6" SS @ 2.00%

SSCO #2
RIM = 227.95
I.E. 6" SS = 222.63

12 LF 6" SS @ 2.00%
I.E. 6" @ HOUSE = 222.87
LOWER LEVEL FF ELEV. 227.74

NOTES

1. DEMOLISH EXISTING HOUSE, PATIO, DECK, WALKWAY, WALL AND DRIVEWAY PRIOR TO PROPOSED CONSTRUCTION.
2. SITE AREA: 8,750 SF (0.20 AC)
3. IMPERVIOUS CALCULATIONS:

ON-SITE		
HOUSE	=	1,808 SF
CONCRETE DRIVEWAY	=	804 SF
DECK	=	91 SF
STAIRS	=	78 SF
RETAINING WALLS	=	20 SF
NEW AND REPLACED SUBTOTAL	=	2,801 SF
EX. ROCKERY / WALL	=	736 SF
TOTAL IMPERVIOUS	=	3,537 SF (40% OF LOT AREA)
OFF-SITE		
ASPHALT DRIVEWAY	=	287 SF
TOTAL PROJECT IMPERVIOUS	=	3,824 SF

4. EARTHWORK QUANTITY:
   CUT = 475 CY
   FILL = 10 CY
5. ROOF DRAIN PIPES SHALL MEET MATERIAL STANDARDS FOR SDR35 FOR PVC PIPE AND N-12 FOR SMOOTH-BORE HDPE PIPE.
6. FOOTING DRAIN PIPES SHALL MEET MATERIAL STANDARDS FOR D2729 FOR PVC, WITH THE PERFORATIONS DIRECTED DOWNWARD.
7. CONTRACTOR SHALL COMPLY WITH THE CITY OF MERCER ISLAND "STORM DRAINAGE REQUIREMENTS" FOR ALL NEW CONSTRUCTION OF DRAINAGE SYSTEM IMPROVEMENTS, INCLUDING ROOF DRAINS, FOOTING DRAINS, AND DRIVEWAY/PARKING AREA DRAINS.
8. CONTRACTOR TO COORDINATE EXACT LOCATION OF THE NEW METER WITH THE CITY'S WATER DEPARTMENT DURING CONSTRUCTION.
9. CONTRACTOR SHALL FIELD LOCATED THE EXISTING SIDE SEWER (SS) LOCATION AND RE-USE IT FOR PROPOSED HOUSE. IF THE EXISTING SS LOCATION IS INADEQUATE FOR THE PROPOSED HOUSE, THE CONTRACTOR SHALL CONNECT THE PROPOSED SS SERVICE TO THE EXISTING SANITARY SEWER MAIN IN MAKER AVE., PER THE CITY'S STANDARD DETAIL S-17.

LEGEND (DEVELOPED)

- PROPOSED CONCRETE
- PROPOSED ASPHALT PAVEMENT
- TRENCH RESTORATION
- SS — PROPOSED SANITARY SIDE SEWER
- SSCO — PROPOSED SANITARY SIDE SEWER CLEANOUT
- W — PROPOSED WATER SERVICE LINE
- PROPOSED WATER METER
- YD — PROPOSED YARD DRAIN
- RD — PROPOSED ROOF DRAIN PIPE
- RDCO — PROPOSED ROOF DRAIN CLEANOUT
- FD — PROPOSED FOOTING DRAIN PIPE
- FDCO — PROPOSED FOOTING DRAIN PIPE
- DS — PROPOSED DOWNSPOUT
- 230 — PROPOSED CONTOUR LINE
- PROPOSED CATCH BASIN, TYPE I

FIRE PROTECTION NOTES:

1. FIRE SPRIKLER REQUIRED
2. BUILDER AND FIRE PROTECTION DESIGNER TO CONFIRM METER AND WATER SERVICE SIZE PRIOR TO CONSTRUCTION OF WATER SERVICE

SURVEY NOTE

EXISTING SURVEY INFORMATION SHOWN HEREON IS BASED ON SURVEY BY TERRANE SURVEYING & MAPPING, AND ELECTRONIC DRAWING FILES AS PROVIDED ON 03/25/2022. SURVEY INFORMATION HAS NOT BEEN FIELD VERIFIED BY GOLDSMITH.

TEMPORARY SHORING

TEMPORARY SHORING SHALL BE INSTALLED AT THE DIRECTION OF THE PROJECT GEOTECHNICAL ENGINEER.

SOILS AMENDMENT NOTE

STOCKPILE AND COMPOST AMENDED DISTURBED LANDSCAPED AREAS PER CITY OF MERCER ISLAND POS-CONSTRUCTION SOIL MANAGMENT

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00317

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LAND DEVELOPMENT SERVICES
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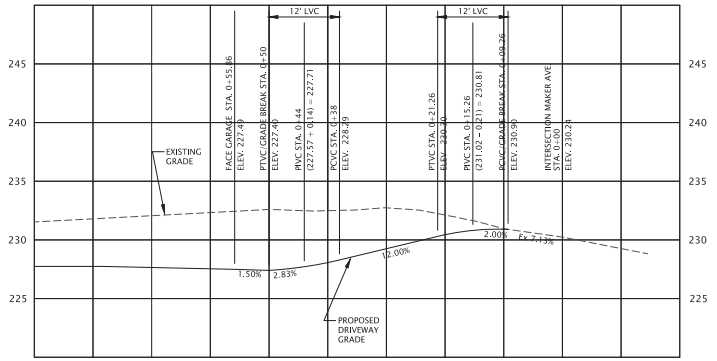
EDITH J. GOLDSMITH — STATE OF WASHINGTON — 24597 — REGISTERED PROFESSIONAL ENGINEER
7/10/2022
MARK A. BARBER — STATE OF WASHINGTON — 35000 — REGISTERED PROFESSIONAL ENGINEER

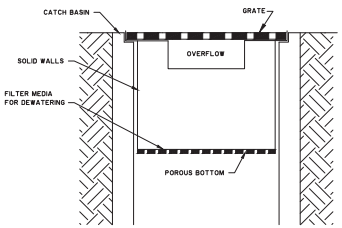
DOROTHY STRAND
JOB NO. 22038
SHEET C-2

GRADING, DRAINAGE AND UTILITY PLAN
FOR
STRAND PROPERTY
6950 SE MAKER ST., CITY OF MERCER ISLAND KING COUNTY, WASHINGTON

NW ¼, SW ¼ SECTION 12, TOWNSHIP 24 N, RANGE 4 E, W.M.
CITY OF MERCER ISLAND, KING COUNTY, WASHINGTON



DRIVEWAY PROFILE
SCALE: HORIZ. 1" = 10'
VERT. 1" = 5'



NOTE: THIS DETAIL IS ONLY SCHEMATIC. ANY INSERT IS ALLOWED THAT HAS A MIN. 0.5 C.F. OF STORAGE, THE MEANS TO DEWATER THE STORED SEDIMENT, AN OVERFLOW, AND CAN BE EASILY MAINTAINED.

MAINTENANCE STANDARDS

1. ANY ACCUMULATED SEDIMENT ON OR AROUND THE FILTER FABRIC PROTECTION SHALL BE REMOVED IMMEDIATELY. SEDIMENT SHALL NOT BE REMOVED WITH WATER, AN ALL SEDIMENT MUST BE DISPOSED OF AS FILL ON-SITE OR HAULED OFF-SITE.

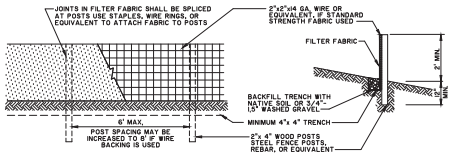
2. ANY SEDIMENT IN THE CATCH BASIN INSERT SHALL BE REMOVED WHEN THE SEDIMENT HAS FILLED ONE-THIRD OF THE AVAILABLE STORAGE. THE FILTER MEDIA FOR THE INSERT SHALL BE CLEANED OR REPLACED AT LEAST MONTHLY.

3. REGULAR MAINTENANCE IS CRITICAL FOR BOTH FORMS OF CATCH BASIN PROTECTION. UNLIKE MANY FORMS OF PROTECTION THAT FAIL GRADUALLY, CATCH BASIN PROTECTION WILL FAIL SUDDENLY AND COMPLETELY IF NOT MAINTAINED PROPERLY.

CATCH BASIN INSERT DETAIL
NTS

STANDARD TESC PLAN NOTES:

1. APPROVAL OF THIS EROSION/SEDIMENTATION CONTROL (ESC) PLAN DOES NOT CONSTITUTE AN APPROVAL OF PERMANENT ROAD OR DRAINAGE DESIGN (E.G. SIZE AND LOCATION OF ROADS, PIPES, RESTRICTORS, CHANNELS, RETENTION FACILITIES, UTILITIES, ETC.).
2. THE IMPLEMENTATION OF THESE ESC PLANS AND THE CONSTRUCTION, MAINTENANCE, REPLACEMENT, AND UPGRADING OF THESE ESC FACILITIES IS THE RESPONSIBILITY OF THE APPLICANT/CONTRACTOR UNTIL ALL CONSTRUCTION IS COMPLETED AND APPROVED AND VEGETATION/LANDSCAPING IS ESTABLISHED.
3. THE BOUNDARIES OF THE CLEARING LIMITS SHOWN ON THIS PLAN SHALL BE CLEARLY FLAGGED IN THE FIELD PRIOR TO CONSTRUCTION. DURING THE CONSTRUCTION PERIOD, NO DISTURBANCE BEYOND THE FLAGGED CLEARING LIMITS SHALL BE PERMITTED. THE FLAGGING SHALL BE MAINTAINED BY THE APPLICANT/CONTRACTOR FOR THE DURATION OF CONSTRUCTION.
4. THE ESC FACILITIES SHOWN ON THIS PLAN MUST BE CONSTRUCTED IN CONJUNCTION WITH ALL CLEARING AND GRADING ACTIVITIES, AND IN SUCH A MANNER AS TO INSURE THAT SEDIMENT AND SEDIMENT LADEN WATER DO NOT ENTER THE DRAINAGE SYSTEM, ROADWAYS, OR VIOLATE APPLICABLE WATER STANDARDS.
5. THE ESC FACILITIES SHOWN ON THIS PLAN ARE THE MINIMUM REQUIREMENTS FOR ANTICIPATED SITE CONDITIONS. DURING THE CONSTRUCTION PERIOD, THESE ESC FACILITIES SHALL BE UPGRADED AS NEEDED FOR UNEXPECTED STORM EVENTS AND TO ENSURE THAT SEDIMENT AND SEDIMENT-LADEN WATER DO NOT LEAVE THE SITE.
6. THE ESC FACILITIES SHALL BE INSPECTED DAILY BY THE APPLICANT/CONTRACTOR AND MAINTAINED AS NECESSARY TO ENSURE THEIR CONTINUED FUNCTIONING.
7. THE ESC FACILITIES ON INACTIVE SITES SHALL BE INSPECTED AND MAINTAINED A MINIMUM OF ONCE A MONTH OR WITHIN THE 48 HOURS FOLLOWING A MAJOR STORM EVENT.
8. AT NO TIME SHALL MORE THAN ONE FOOT OF SEDIMENT BE ALLOWED TO ACCUMULATE WITHIN A TRAPPED CATCH BASIN. ALL CATCH BASINS AND CONVEYANCE LINES SHALL BE CLEANED PRIOR TO PAVING. THE CLEANING OPERATION SHALL NOT FLUSH SEDIMENT LADEN WATER INTO THE DOWNSTREAM SYSTEM.
9. STABILIZED CONSTRUCTION ENTRANCES SHALL BE INSTALLED AT THE BEGINNING OF CONSTRUCTION AND MAINTAINED FOR THE DURATION OF THE PROJECT. ADDITIONAL MEASURES MAY BE REQUIRED TO INSURE THAT ALL PAVED AREAS ARE KEPT CLEAN FOR THE DURATION OF THE PROJECT.



NOTE: FILTER FABRIC FENCES SHALL BE INSTALLED ALONG CONTOUR WHENEVER POSSIBLE.

MAINTENANCE STANDARDS

1. ANY DAMAGE SHALL BE REPAIRED IMMEDIATELY.
2. IF CONCENTRATED FLOWS ARE EVIDENT UPHILL OF THE FENCE, THEY MUST BE INTERCEPTED AND CONVEYED TO A SEDIMENT TRAP OR POND.
3. IT IS IMPORTANT TO CHECK THE UPHILL SIDE OF THE FENCE FOR SIGNS OF THE FENCE CLOGGING AND ACTING AS A BARRIER TO FLOW AND THEN CAUSING CHANNELIZATION OF FLOWS PARALLELED TO THE FENCE. IF THIS OCCURS, REPLACE THE FENCE AND/OR REMOVE THE TRAPPED SEDIMENT.
4. SEDIMENT MUST BE REMOVED WHEN THE SEDIMENT IS 6" HIGH.
5. IF THE FILTER FABRIC HAS DETERIORATED DUE TO ULTRAVIOLET BREAKDOWN, IT SHALL BE REPLACED.

SILT FENCE
NTS

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KEITH J. GOLDSMITH STATE OF WASHINGTON 24597 REGISTERED PROFESSIONAL ENGINEER
MARK A. BARBER STATE OF WASHINGTON 38000 REGISTERED PROFESSIONAL ENGINEER
7/10/2022

DOROTHY STRAND
JOB NO. 22038
SHEET C-3

DETAILS AND NOTES
FOR
STRAND PROPERTY
6950 SE MAKER ST., CITY OF MERCER ISLAND KING COUNTY, WASHINGTON

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Thursday, July 07, 2022 - 10:37am

Strand Property
6950 SE Maker Street, Mercer Island
SF Residence Building Permit

Storm Drainage Report

July 2022
Job Number: 22038

GOLDSMITH
LAND DEVELOPMENT SERVICES

00319

SECTION 1: PROJECT OVERVIEW

Project Location

The project site is an 8,750 sf single-family lot located at 6950 SE Maker St, Mercer Island (Tax Parcel #935090-0620). The project site is located in the northwest quarter, of the southwest quarter of Section 12, Township 24 North, Range 4E, W.M. See the attached Vicinity Map (Figure 1) and Aerial photo (Figure 2) for the project location.

Project Description

The project will remove the existing residence and a new single-family residence will be constructed. Proposed improvements will include utilities; driveway improvements for access from SE Maker St; site grading for the new single-family residence, and a connection to the City of Mercer Island stormwater system. Refer to Figure 3 for the project site plan.

SECTION 2: EXISTING CONDITIONS

The project site currently contains one existing home as shown in the photo below. Access to the site is provided directly by SE Maker St, the road directly fronting the project to the south. The home is located in a residential neighborhood with existing single-family homes directly to the north, east, west, and across the street to the south, as shown in the attached aerial photo (Figure 2).

Existing Project Site

Site topography is shown on the topographic survey included in Figure 4. The existing house is located over the eastern area of the lot extending towards the north boundary. Driveway access is near the east boundary and steeply ascends from SE Maker St at a relatively steep grade of approximately 20%. The yard area adjacent to the house to the west and north of the house is relatively flat (5% to 10%) trending in a westerly direction. This area slopes to an approximate elevation of 230.0 ft before becoming steeper (~20%) and sloping towards a tiered rockery along the west site boundary. This rockery wraps around to the front (south) property boundary with the height tapering off as it continues to the east. This rockery along the west boundary is a shorter 2 to 3 ft high upper rockery located above a 9 to 10 ft higher rockery.

The southeast (front) portion of the lot site is predominately covered with driveway area the areas to the west and north of the existing house are landscaped with a mix of lawn area and trees/ shrubs. A large portion of the rear yard to the north is covered by existing decks and patio areas. **Under the existing condition, 5,759 sf (66%) of the existing lot area is covered by impervious/ hardscape areas.** This impervious area consists of a roof area (3,042 sf), driveway (1,024 sf), miscellaneous concrete walks and patios, and deck and wall areas. The existing site topography and surface features are shown in Figure 4.

Site Soils Conditions

Soils for the site have been mapped as Arents, Alderwood material (AmC). These soils are classified as SCS Hydrologic Group C till soils. A map generated from the NRSC Soils Web showing soil types in the vicinity of the project site has been included in Figure 5. Investigations by the project geotechnical engineer indicate consistency with glacial till soils however, soils observed within the west yard area were primarily loose, silty sand fill. The site is mapped as infiltration infeasible as shown on Figure 7. Groundwater was not observed during site investigations. Please refer to the project geotechnical report or additional information regarding the site soil conditions and an assessment of the site's critical areas. A copy of the City GIS mapping for steep slope and erosion hazard areas has been attached as Figure 8.

Existing Site Drainage Patterns

Under the existing condition, roof runoff is collected and directed to a roof drain system connecting to the public storm drain system within the SE Maker St right-of-way. Yard runoff from the rear and west lot areas sheet flows to the west towards the previously described rockery and ultimately onto the adjacent property. The driveway sheet flows onto the SE Maker St roadway before entering the system downstream of the property to the west.

Section 3.0 Downstream Analysis

Site runoff enters the city storm system, a public closed conveyance system draining to the west along SE Maker St reaching Lake Washington approximately 1,000 ft downstream of the site. Elements of the storm system are shown in the City GIS mapping (Figure 6) and as described in detail below. Based on on-site observations, and the slope of the system there appears to be no downstream constraints. On the day of observation (07/08/2022), the city was relining the last segment downstream from SE Mercer Way to Lake Washington.

Also, the amount of impervious area from the site is reduced under the developed condition reducing the amount of runoff directed to the downstream system (see Section 4). Based on the downstream system, and the reduction in site runoff, detention is not required for this site.

The following is a description of the existing stormwater flow path, See Figure 6 for more detail, references to the location identifiers are included below:

1. Runoff from upstream areas is directed into the public storm system in SE Maker St. **(Photo 1)**.
2. Runoff is discharged from the site to the storm system within SE Maker St. right-of-way. The system is a 12-inch pipe that runs west within SE Maker St.**, Photo 2, 3, and 4.**
3. Flow travels west steeply towards the west portion of SE Maker St. 165 ft downstream of the site, **Photos 5.**
4. Stormwater continues westward along SE Maker St. within a 12-inch pipe to SE Mercer Way 450 ft downstream of the site. **Photo 6-7**
5. Runoff continues north along SE Mercer Way through an 18-inch pipe system for approximately 160 feet. **Photo 8**
6. Runoff travels west towards Lake Washington through a 12" pipe system 1,000 ft downstream of the site. This system has just been relined. **Photo 9-10**
7. System discharges to Lake Washington.

Photo 1 is looking west from the intersection of SE Maker St and 72nd Ave SE. This catch basin is where drainage from 72nd Ave SE storm system turns westward towards Lake Washington via SE Maker St.

Photo 2 is looking at the catch basin located at the east property line. Drainage system is 12" in diameter with an approx. slope of 15%.

Photo 3 shows the existing catch basin at the middle of the property. This is the structure that will receive the proposed connection from the site. The 12" line has a slope of approx.

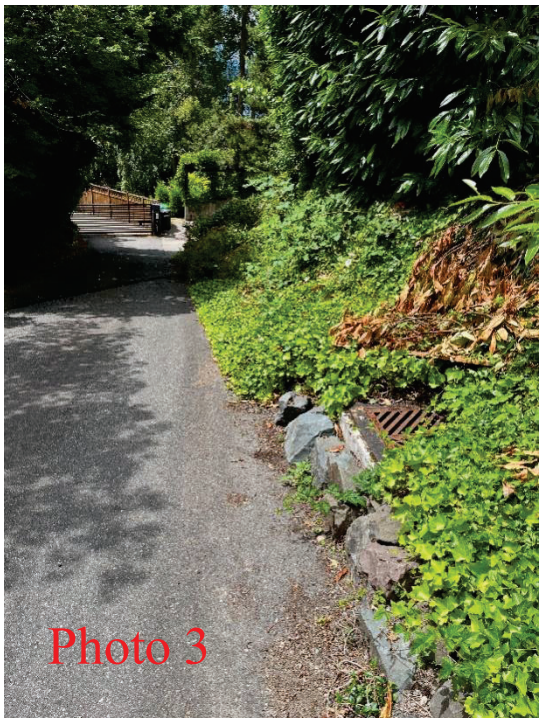
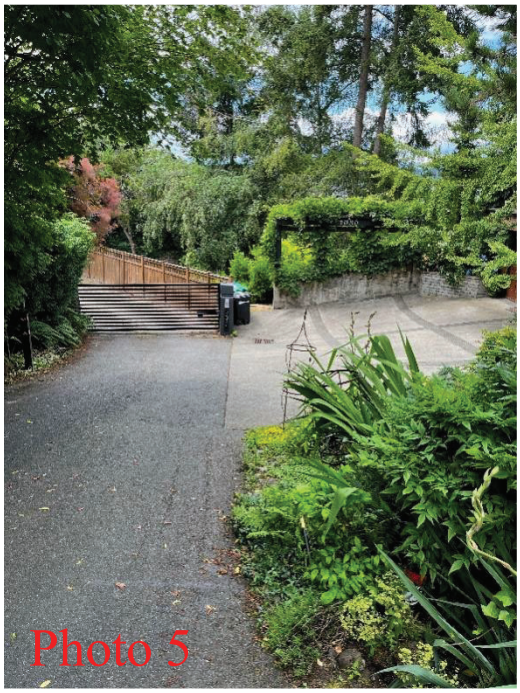


Photo 4 shows the existing catch basin at the southwest corner of the site on SE Maker St.

Photo 5 shows the continuation of the upper portion of SE Maker St. The photo shows the last catch basin before the system descends steeply towards the western portion of SE Maker. The pipe is 12" in diameter and has a slope of 40% through the piped section west of this structure.



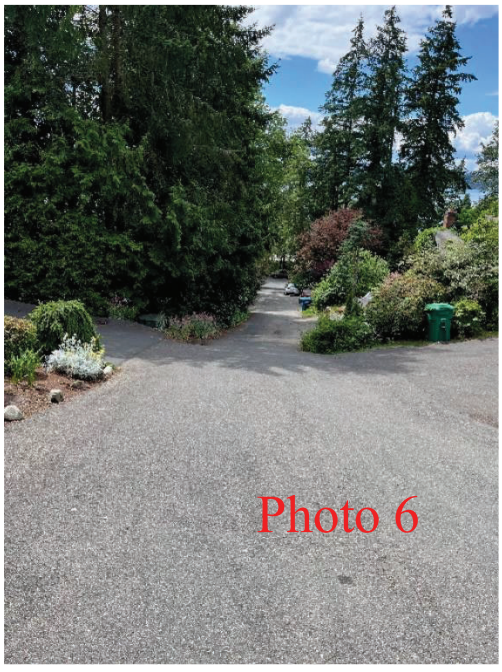


Photo 6 shows the western portion of SE Maker St towards SE Mercer Way. The storm system is 12" in diameter and has a slope of approximately 15 to 25%.

The storm system along SE Maker collects street drainage. Photo 7 shows the pair of catch basins located directly upstream of SE Mercer Way.

Photo 8 shows the structure redirecting the SE Maker system north along SE Mercer Way. The system is relatively flat and has an 18" diameter. GIS mapping shows a surface drainage feature draining to this location. There are no signs that this feature exists.

Photo 9 shows the structure upstream of where the system is redirected to Lake Washington.

Photo 10 is looking at the west side of SE Mercer Way. The city is relining the existing system towards the Lake.

Section 4 Conveyance Analysis

The potential impacts on the conveyance capacity of the stormwater conveyance system downstream of the project have been assessed. Site drainage is directed to a stormwater conveyance system within SE Maker St as previously described. Peak stormwater runoff rates were calculated using WWHM2012 with a 15 min time step. The simulated developed flow rate decreased by 0.0084 cfs relative to the existing condition. A copy of the simulation results and basin area assumptions are included herein. This analysis assumes that the predeveloped conditions are that of the existing home, not historical conditions.

Peak Flow: Ex. Q_{100}=0.1322 cfs
Dev Q_{100}=0.1238 cfs

Existing Site Conditions		
	SF	**AC**
Total Site Area (Target Pervious and Impervious Area)	8,750	0.201
Roof / Shed	3,042	0.070
Conc. Driveway	1,024	0.024
Conc Walk	200	0.005
Pavers	542	0.012
Deck	117	0.003
Wood Steps and Walls	40	0.001
Block Wall	4	0.000
Rockery	790	0.018
On-Site Impervious	5,759	0.132
On-Site Pervious	2,991	0.069
Off-Site Impervious	333	0.008
Off-Site PerviousImpervious	150	0.003
Total Basin Area	9,233	0.212
Total Model Areas		
Effective Impervious Area	***6,092***	***0.140***
Landscape (Till Grass)	***2,991***	***0.069***
Total Project Area	**9,233**	**0.212**

Developed Site Conditions		
	SF	**AC**
Total Site Area (Target Pervious and Impervious Area)	8,750	0.201
Roof	1,808	0.042
Stairs	78	0.002
Retaining Wall	20	
Deck	91	
Ex. Wood Wall	5	
Ex. Rockery	731	
Conc Driveway	804	0.018
On-Site Impervious	3,537	0.081
On-Site Pervious	5,213	0.120
Off-Site Impervious	483	0.011
Total Basin Area	9,233	0.212
Total Model Areas		
Effective Impervious Area	***4,020***	***0.092***
Landscape (Till Grass)	***5,213***	***0.120***
Total Project Area	**9,233**	**0.212**

WWHM2012
PROJECT REPORT

Project Name: 22038
Site Name:
Site Address:
City :
Report Date: 7/10/2022
Gage : Seatac
Data Start : 1948/10/01
Data End : 2009/09/30
Precip Scale: 1.00
Version Date: 2019/09/13
Version : 4.2.17

Low Flow Threshold for POC 1 : 50 Percent of the 2 Year

High Flow Threshold for POC 1: 50 year

PREDEVELOPED LAND USE

Name : Existing
Bypass: No

GroundWater: No

Pervious Land Use	acre
C, Lawn, Mod	.069
Pervious Total	0.069

Impervious Land Use	acre
ROADS FLAT	0.143
Impervious Total	0.143
Basin Total	0.212

Element Flows To:

Surface	Interflow	Groundwater

MITIGATED LAND USE

Name : Developed
Bypass: No

GroundWater: No

Pervious Land Use	acre
C, Lawn, Mod	.092
Pervious Total	0.092

Impervious Land Use	acre
ROADS FLAT	0.12
Impervious Total	0.12
Basin Total	0.212

Element Flows To:

Surface	Interflow	Groundwater

ANALYSIS RESULTS

Stream Protection Duration

Predeveloped Landuse Totals for POC #1
Total Pervious Area:0.069
Total Impervious Area:0.143

Mitigated Landuse Totals for POC #1
Total Pervious Area:0.092
Total Impervious Area:0.12

Flow Frequency Return Periods for Predeveloped. POC #1

Return Period	Flow(cfs)
2 year	0.059797
5 year	0.077646
10 year	0.090033
25 year	0.106372
50 year	0.119062
100 year	0.13221

Flow Frequency Return Periods for Mitigated. POC #1

Return Period	Flow(cfs)
2 year	0.052975
5 year	0.070058
10 year	0.082082
25 year	0.098118
50 year	0.110694
100 year	0.123824

Stream Protection Duration
Annual Peaks for Predeveloped and Mitigated. POC #1

Year	Predeveloped	Mitigated
1949	0.083	0.076
1950	0.078	0.068
1951	0.051	0.046
1952	0.040	0.034
1953	0.043	0.037
1954	0.049	0.043
1955	0.054	0.048
1956	0.053	0.047
1957	0.064	0.058
1958	0.048	0.042
1959	0.046	0.039
1960	0.053	0.048
1961	0.053	0.047
1962	0.044	0.037
1963	0.052	0.047
1964	0.048	0.042
1965	0.066	0.060
1966	0.041	0.036
1967	0.073	0.068
1968	0.084	0.074
1969	0.060	0.054
1970	0.056	0.050
1971	0.067	0.060

1972	0.075	0.069
1973	0.038	0.032
1974	0.063	0.057
1975	0.065	0.059
1976	0.048	0.043
1977	0.047	0.041
1978	0.059	0.051
1979	0.079	0.067
1980	0.085	0.079
1981	0.062	0.054
1982	0.091	0.083
1983	0.068	0.059
1984	0.045	0.040
1985	0.062	0.054
1986	0.052	0.047
1987	0.079	0.067
1988	0.046	0.039
1989	0.058	0.048
1990	0.126	0.120
1991	0.096	0.090
1992	0.045	0.039
1993	0.037	0.032
1994	0.038	0.032
1995	0.054	0.048
1996	0.064	0.059
1997	0.060	0.054
1998	0.056	0.048
1999	0.126	0.114
2000	0.060	0.054
2001	0.061	0.052
2002	0.081	0.073
2003	0.064	0.059
2004	0.116	0.105
2005	0.053	0.047
2006	0.048	0.043
2007	0.113	0.108
2008	0.094	0.088
2009	0.071	0.059

Stream Protection Duration
Ranked Annual Peaks for Predeveloped and Mitigated. POC #1

Rank	**Predeveloped**	**Mitigated**
1	0.1259	0.1196
2	0.1257	0.1144
3	0.1163	0.1076
4	0.1125	0.1050
5	0.0963	0.0900
6	0.0941	0.0877
7	0.0908	0.0829
8	0.0847	0.0787
9	0.0837	0.0763
10	0.0834	0.0741
11	0.0806	0.0734
12	0.0793	0.0688
13	0.0787	0.0684
14	0.0784	0.0681

15	0.0748	0.0674
16	0.0730	0.0673
17	0.0707	0.0600
18	0.0684	0.0598
19	0.0673	0.0594
20	0.0664	0.0590
21	0.0648	0.0589
22	0.0641	0.0589
23	0.0641	0.0587
24	0.0641	0.0577
25	0.0633	0.0571
26	0.0619	0.0545
27	0.0618	0.0544
28	0.0610	0.0544
29	0.0603	0.0543
30	0.0603	0.0538
31	0.0602	0.0520
32	0.0586	0.0508
33	0.0577	0.0498
34	0.0562	0.0484
35	0.0556	0.0481
36	0.0545	0.0480
37	0.0545	0.0478
38	0.0535	0.0476
39	0.0533	0.0474
40	0.0529	0.0472
41	0.0526	0.0468
42	0.0523	0.0468
43	0.0518	0.0467
44	0.0511	0.0464
45	0.0490	0.0435
46	0.0485	0.0434
47	0.0483	0.0433
48	0.0481	0.0423
49	0.0476	0.0421
50	0.0465	0.0411
51	0.0462	0.0395
52	0.0461	0.0393
53	0.0449	0.0388
54	0.0446	0.0387
55	0.0435	0.0374
56	0.0434	0.0369
57	0.0414	0.0361
58	0.0401	0.0340
59	0.0385	0.0323
60	0.0379	0.0321
61	0.0372	0.0318

Stream Protection Duration
POC #1
The Facility PASSED

The Facility PASSED.

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
0.0299	1619	978	60	Pass

0.0308	1459	882	60	Pass
0.0317	1295	786	60	Pass
0.0326	1170	719	61	Pass
0.0335	1051	655	62	Pass
0.0344	963	588	61	Pass
0.0353	879	542	61	Pass
0.0362	793	497	62	Pass
0.0371	727	453	62	Pass
0.0380	667	417	62	Pass
0.0389	615	381	61	Pass
0.0398	568	351	61	Pass
0.0407	527	336	63	Pass
0.0416	489	313	64	Pass
0.0425	443	293	66	Pass
0.0434	409	266	65	Pass
0.0443	382	242	63	Pass
0.0452	358	226	63	Pass
0.0461	342	213	62	Pass
0.0470	317	193	60	Pass
0.0479	294	175	59	Pass
0.0488	270	161	59	Pass
0.0497	251	152	60	Pass
0.0506	227	142	62	Pass
0.0515	214	129	60	Pass
0.0524	201	121	60	Pass
0.0533	190	116	61	Pass
0.0542	174	110	63	Pass
0.0551	164	104	63	Pass
0.0560	155	101	65	Pass
0.0569	144	94	65	Pass
0.0578	134	89	66	Pass
0.0587	125	84	67	Pass
0.0596	117	75	64	Pass
0.0605	107	71	66	Pass
0.0614	104	70	67	Pass
0.0623	99	69	69	Pass
0.0632	96	64	66	Pass
0.0641	86	60	69	Pass
0.0650	82	58	70	Pass
0.0659	81	56	69	Pass
0.0668	78	52	66	Pass
0.0677	74	45	60	Pass
0.0686	72	41	56	Pass
0.0695	64	38	59	Pass
0.0704	64	36	56	Pass
0.0713	61	34	55	Pass
0.0722	57	32	56	Pass
0.0731	53	31	58	Pass
0.0740	52	30	57	Pass
0.0749	49	29	59	Pass
0.0758	42	24	57	Pass
0.0767	41	23	56	Pass
0.0776	39	23	58	Pass
0.0785	36	22	61	Pass
0.0794	33	19	57	Pass
0.0803	32	19	59	Pass
0.0812	29	19	65	Pass

0.0821	29	18	62	Pass
0.0830	28	16	57	Pass
0.0839	23	15	65	Pass
0.0848	21	14	66	Pass
0.0857	20	13	65	Pass
0.0866	20	13	65	Pass
0.0875	19	13	68	Pass
0.0884	19	12	63	Pass
0.0893	16	10	62	Pass
0.0902	16	9	56	Pass
0.0911	14	8	57	Pass
0.0920	13	7	53	Pass
0.0929	13	7	53	Pass
0.0938	13	7	53	Pass
0.0947	11	7	63	Pass
0.0956	10	7	70	Pass
0.0965	8	7	87	Pass
0.0974	8	7	87	Pass
0.0983	8	6	75	Pass
0.0992	8	6	75	Pass
0.1001	8	5	62	Pass
0.1010	8	5	62	Pass
0.1019	7	4	57	Pass
0.1029	7	4	57	Pass
0.1038	7	4	57	Pass
0.1047	7	4	57	Pass
0.1056	7	3	42	Pass
0.1065	7	3	42	Pass
0.1074	7	3	42	Pass
0.1083	7	2	28	Pass
0.1092	6	2	33	Pass
0.1101	6	2	33	Pass
0.1110	5	2	40	Pass
0.1119	5	2	40	Pass
0.1128	3	2	66	Pass
0.1137	3	2	66	Pass
0.1146	3	1	33	Pass
0.1155	3	1	33	Pass
0.1164	3	1	33	Pass
0.1173	2	1	50	Pass
0.1182	2	1	50	Pass
0.1191	2	1	50	Pass

Water Quality BMP Flow and Volume for POC #1
On-line facility volume: 0 **acre-feet**
On-line facility target flow: 0 **cfs.**
Adjusted for 15 min: 0 **cfs.**
Off-line facility target flow: 0 **cfs.**
Adjusted for 15 min: 0 **cfs.**

LID Report

LID Technique	Used for	Total Volume	Volume	Infiltration	Cumulative Percent	Water Quality	Percent	Comment

	Treatment?	Needs Treatment (ac-ft)	Through Facility (ac-ft)	Volume (ac-ft.)	Volume Infiltration Credit	Volume Water Quality Infiltrated	Treated
Total Volume Infiltrated		0.00	0.00	0.00		0.00	0.00
0.00	0%	No Treat. Credit					

Compliance with LID Standard 8
Duration Analysis Result = Passed

Perlnd and Implnd Changes

No changes have been made.
