

On-site Stormwater Management Calculator Instructions

Version 01-04-2023

To use the On-Site Stormwater Calculator you must select "Enable Content" when the Security Warning appears.
Note this calculator is designed to work with Microsoft Excel 2010 or newer.

Introduction

This spreadsheet tool helps users implement the On-site Stormwater Management requirements for projects in the City of Seattle. In addition, this spreadsheet documents the other applicable Stormwater Code requirements for projects and provides a Site and Drainage Control Summary. Instructions for evaluating, selecting, and sizing on-site best management practices (BMPs) are provided below.

Note: all projects that require Drainage Review by SDCI must include a Site and Drainage Control Summary Sheet on the Drainage and Wastewater Control Plan.

Refer to Volume 1, *Volume 3 (Section 3.3 and Chapter 5), and Appendix C of the Seattle Stormwater Manual (Seattle 2021)* for On-site Stormwater Management requirements, BMP design requirements and infeasibility criteria.

The "Project Summary" and either the "BMP Sizing" or "BMP Modeling" tabs can be used to provide documentation for compliance with the On-site List requirement.

How to Use the On-site List Approach Calculator:

Note: The On-site List Approach is the most commonly used method. Refer to instructions at the bottom of this page if the On-site Performance Standard will be used.

Project Summary Tab:

A. Fill in the light green cells in the "Project Summary" tab.

Step 1: Determine if Dispersion and Infiltration are Feasible

Refer to *Section 3.1 and Section 3.2* in Volume 3 of the *Seattle Stormwater Manual (Seattle 2021)*.

Step 2: Calculate Areas by Surface Type

Divide the project area into hard surface areas with distinct drainage pathways and conduct a BMP evaluation for each surface "sub area". Refer to Figure 1 below for an example. Enter roof and non-roof areas and number of areas into "Project Summary" tab and hit Enter. Excel tabs will be generated for each individual surface.

Note: Do not create a surface tab for Permeable Pavement Facilities (PPF). PPFs are the only hard surface that will not have a surface tab. Enter the PPF area on the BMP Sizing tab.

Step 3: Select the On-site List Approach (Pre-sized Approach) Calculator option

Check the box for the "On-site List Approach (Pre-sized Approach) Calculator" on the Summary Tab.

The On-site Lists that indicate the BMPs that must be evaluated and the order in which they must be evaluated are provided in Volume 1, *Section 5.2* for all project type(s). The applicable on-site BMPs are provided in this calculator in the "Surface" tabs based on information entered in the "Project Summary" tab.

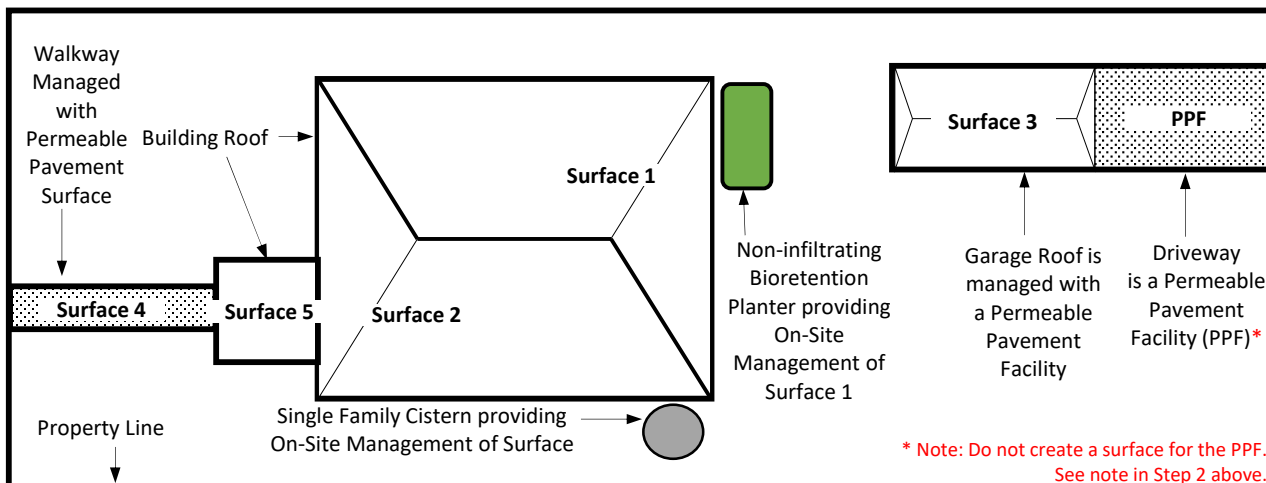


Figure 1. Example Delineation of Hard Surface Areas with Distinct Drainage Pathways for a Parcel or Single Family Project.

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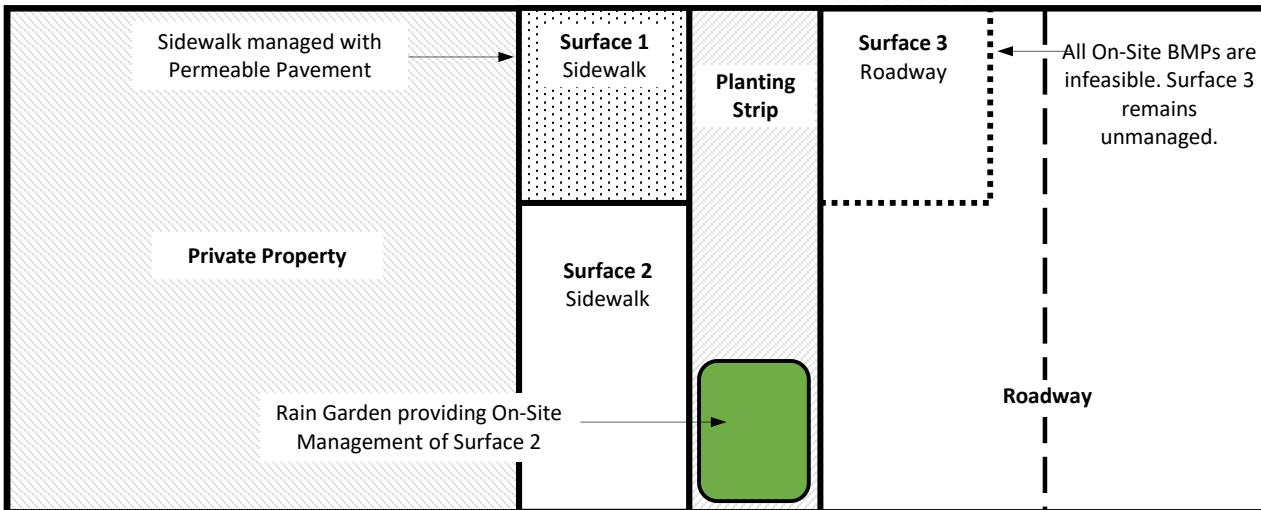


Figure 2. Example Delineation of Hard Surface Areas for Trail and Sidewalk Projects.

Surface Tab(s):

Step 4: Evaluate BMPs by Category

On each "Surface" tab, select "Infeasible", "Not evaluated", or "Use BMP" for each category. Note: BMPs in each category may be evaluated in any order. (See detailed information in Steps 5 through 10).

Step 5: Evaluate Feasibility of Category 1 BMPs

Determine feasibility of the BMP(s) in Category 1. The BMP is considered infeasible if one of the following applies:

- The BMP is considered infeasible per the criteria provided in the "Infeasibility Criteria" tab.
- Competing needs (e.g., historic preservation laws, health and safety standards) as provided in Seattle Municipal Code (SMC), Section 22.805.070 conflict with the BMP.
- The size of the BMP in the "Surface" tab(s) (generated based on "Project Summary" tab inputs) cannot be met on the site.

Step 6: Select Category 1 BMP(s)

If any of the Category 1 BMPs are feasible for a surface, then a Category 1 BMP must be used to manage runoff from the surface. Identify the BMP selected for the surface area by selecting "Use BMP" from the drop down menu. After BMP(s) are selected, the calculator will size the BMP for the surface area based on the facility information (e.g., ponding depth) entered in the "BMP Sizing" tab.

Note: Facility sizes provided in this tool are the minimum size required. Facilities can be made larger to meet additional requirements (i.e., flow control and/or water quality treatment standards).

Step 7: Document Infeasibility of Category 1 BMPs (if applicable)

If all the Category 1 BMPs are deemed infeasible, select "Infeasible" and the applicable "infeasibility criteria" from the drop down menus and proceed to Step 8. If needed for clarity, the applicant shall provide a narrative description and rationale with substantial evidence sufficient to explain and justify the applicant's conclusion that On-site BMPs are infeasible.

Step 8: Evaluate/Select Category 2 BMPs

If all of the Category 1 BMPs are deemed infeasible, evaluate the On-site BMPs in Category 2 using the same approach described in Steps 5 through 7. Once you move to Category 2, you can select any BMP within that Category.

Step 9: Evaluate/Select Category 3 BMPs

If all of the Category 2 BMPs are deemed infeasible, evaluate the On-site BMPs in Category 3 using the same approach described in Steps 5 through 7. Once you move to Category 3, you can select any BMP within that Category.

Step 10: Evaluate/Select Category 4 BMPs

If all of the Category 3 BMPs are deemed infeasible, evaluate the On-site BMPs in Category 4 using the same approach described in Steps 5 through 7.

Step 11: Evaluate/Select Category 5 BMPs (if applicable)

If all of the Category 4 BMPs are deemed infeasible, evaluate the On-site BMPs in Category 5 using the same approach described in Steps 5 through 7.

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BMP Sizing Tab:

B. Once a "Surface" tab is completed for each surface, complete the information on the "BMP Sizing" tab

For each surface, select the BMP that the surface drains to. If more than one surface drains to the same BMP, indicate with the same BMP number. The appropriate sizing will be provided for each BMP based on the area of the surfaces draining to it. For BMPs with multiple design parameters (i.e., ponding depth, side slopes), select the design parameters that will be applied to the project.

Project Summary Tab:

C. The "Project Summary" tab summarizes the selected BMPs and BMP sizes by surface.

How to Use this Spreadsheet for the On-site Performance Standard

Project Summary Tab:

A. Fill in the light green cells in the "Project Summary" tab.

Step 1: Determine if Dispersion and Infiltration are Feasible

Refer to *Section 3.1 and Section 3.2* in Volume 3 of the Seattle Stormwater Manual (Seattle 2021).

Step 2: Select the On-site **Performance** Standard Option

Check the box for the "On-site Performance Standard" on the Summary Tab.

When using the Performance Standard, any BMP from the Stormwater Manual may be selected in any order (i.e. the On-site Lists are not required to be used).

Step 3: Conduct Stormwater Modeling Using an Approved Continuous Runoff Model

Determine which On-site Stormwater Performance goal from Volume 1, *Section 5.2.1* is applicable to your project and use an approved continuous runoff model to demonstrate that this standard is met. See On-site Performance Standard BMP Design in *Appendix F, Section F-4* of the Seattle Stormwater Manual (Seattle 2021).

Submit the calculations and a narrative describing the calculations in a Drainage Report.

Step 4: Calculate Areas Tributary to Each BMP

Divide the hard surface areas of the project into surfaces that are managed with each BMP selected using the continuous runoff modeling indicated above. If some hard surfaces bypass all BMPs, designate a surface for these areas to be identified as a "bypass area".

Enter the number of separate roof and non-roof areas into "Project Summary" tab and hit Enter. Instead of creating separate surface tabs, the Performance Standard mode will create user inputs for each "surface" in the BMP Modeling Tab.

Step 5: Document the BMP's Used in the BMP Modeling Tab

Complete the green input fields in the BMP Modeling Tab to identify which BMP manages each "surface". Verify that the summary of these BMPs correctly shows on the Summary tab.

On-site Stormwater Management Calculator
Site and Drainage Control Summary

Version 01-04-2023

To use the On-Site List Calculator you must select "Enable Content" when the Security Warning appears.

Project Information

Site Address4401 Fremont Ave NSDCI Project Number6904773-CN

Primary ContactWade Watkinson, PESDOT Project NumberSUSIP0000425

Project TypeParcel-Based▼Primary Contact E-mail or Phonewade@wecivil.com

Is this project "Closely Related" to other SDCI construction permits/projects?YesNo

"Closely Related" SDCI Construction Permit Numbers

Is this project associated with a Short Plat or Subdivision?YesNoSDCI MUP Number

Was the project lot created or altered in size after Jan 1, 2016?No

Total Site Area16,469sfTotal Closely Related and/or Short Plat/Subdivision Site Area

Total New plus Replaced Hard Surface Area (NPRHS)15,244sfTotal Closely Related and/or Short Plat/Subdivision NPRHS

Total New and/or Replaced Lawn/Landscaping1,225sf

Undisturbed and Protected Site Area0sf

Total Existing Hard Surface Area To Remain0sfTotal Existing Hard Surface Area (Prior to Project)15,000sf

Site Information

Note: Reference the Preliminary Assessment Report (PAR) to complete this section.

Approved Point of Stormwater DischargePublic Storm Drain Main

Drainage BasinDesignated Receiving Water

Is the downstream drainage system considered Capacity Constrained by SPU?

Approved Point of Wastewater DischargePublic Sanitary Sewer Main

Approved Point of Sub-Surface DischargePublic Storm Drain Main

Required Flow Control StandardPre-Developed PasturePre-Developed ForestPeak ControlWetland ProtectionExisting ConditionsNone

Project will permanently discharge groundwater?No

Required Water Quality Treatment StandardOil ControlEnhancedBasicNone

Total Pollution Generating Hard Surface Area202sfw/ Closely Related/Short Plat/Subdiv.

Total Pollution Generating Pervious Surface Area0sfw/ Closely Related/Short Plat/Subdiv.

Environmentally Critical AreasNo

Steep SlopePotential SlideRiparian CorridorWetlandLiquefactionFlood ProneLandfillKnown LandslideFish / WildlifePeat / Groundwater ManagementShoreline Habitat

Is there soil and/or groundwater contamination on this site?YesSource Control is requiredNo

Infiltration Information

Is infiltration investigation required?NoWhy?Other

Is infiltration on the site feasible?NoWhy?Can't meet setbacks from structures/property lines

Site Measured Infiltration Rate x Infiltration Rate Correction Factor 0.5 = 0 Site Design Inf Rate

On-site Stormwater Management (select List Approach or Performance Standard)

On-site List Approach (Pre-sized) Calculator -- Complete the Surface tabs and BMP Sizing tabs (Most commonly used)

On-site Performance Standard -- Stormwater modeling by Civil Engineer (Also for No Off-site Point of Discharge)

Number of roof areas4

Number of other surface areas5

Surface	Surfaces Description	On-site BMP	Contrib. Area (sf)	Facility Size (sf)	Facility Configuration
1	Roof:Vegetated Roof 01	Vegetated Roof System #1	12,342	9,990 sf	4 inch Single-Course
2	Roof:Vegetated Roof 02	Vegetated Roof System #2	1,314	1,094 sf	8 inch Single-Course
3	Roof:Roof 03 - Canopies	None Feasible	527	-	
4	Roof:Roof 4 - Misc Roof	None Feasible	55	-	
5	Surface:Sidewalk at gradi	None Feasible	215	-	
6	Surface:Slab on Grade - F	None Feasible	127	-	
7	Surface:Driveway off N 4	None Feasible	202	-	
8	Surface:Sidewalk at gradi	None Feasible	316	-	
9	Surface:Sidewalk - Elevat	Trees	146	-	3 New Deciduous

Total New/Replaced Roof Area14,238Total Roof Area Managed13,656

Total New/Replaced Other Surface Area1,006Total Other Surface Managed0

Total Area Managed13,656sfTotal Volume Managed On Site98,254 gal

Estimated compost required for soil amendment7.595cyVolume of compost will be verified by the Inspector.

On-site Stormwater Management Calculator - List Approach

Surface Identification and BMP Evaluation for Parcel-Based Projects

Project No.

6904773-CN

Hard Surface Number

1

Hard Surface Type

Roof

Hard Surface Description

Vegetated Roof 01

Surface Area (sf)

12342

Category 1

(Select 1 BMP from Category 1, order does not matter, or move to Category 2)

BMP	Feasibility	Infeasibility Criteria (see infeasibility criteria tab for full text)
Full Dispersion	Infeasible	14 The minimum native vegetation flowpath length is less than 100 feet.
Infiltration Trench	Infeasible	11 The area available for siting does not meet the minimum horizontal setback requirements (refer to Volume 3, Section 3.2).
Dry Well	Infeasible	11 The area available for siting does not meet the minimum horizontal setback requirements (refer to Volume 3, Section 3.2).

Category 2

BMP	Feasibility	Infeasibility Criteria
Rain Garden	Not Evaluated	
Evaluation not allowed when project requires flow control or water quality treatment or >5000 SF hard surface is infiltrated onsite		
Infiltrating Bioretention	Infeasible	13 The area available for siting does not meet the minimum horizontal setback requirements (refer to Volume 3, Section 3.2).
Rainwater Harvesting - Category 2 Sizing	Not Evaluated	
Evaluation not required but allowed.		
Permeable Pavement Facility	Infeasible	11 The area available for siting does not meet the minimum horizontal setback requirements (refer to Volume 3, Section 3.2).
Permeable Pavement Surface	Not Evaluated	
Evaluation not allowed for roof surfaces.		
Sidewalk/Trail Compost-Amended Strip	Not Evaluated	
Evaluation not allowed for roof surfaces.		

Category 3

BMP	Feasibility	Infeasibility Criteria
Sheet Flow Dispersion	Infeasible	14 The minimum vegetated flow path for sheet flow dispersion cannot be met. Note: A 10 foot flowpath is required to disperse runoff from a contributing flow length of u
Concentrated Flow Dispersion	Not Evaluated	
Evaluation not allowed for roof surfaces.		
Splashblock Downspout Dispersion	Infeasible	14 The vegetated flowpath is less than 50 feet.
Trench Downspout Dispersion	Infeasible	14 The minimum dispersion trench length of 10 feet for every 700 square feet of drainage area cannot be met.

Category 4

BMP	Feasibility	Infeasibility Criteria
Non-Infiltrating Bioretention (NIB)		
Water Quality BMP in lieu of NIB	Not Evaluated	
Evaluation is allowed but not required.		
Rainwater Harvesting - Category 4 Sizing	Not Evaluated	
Evaluation not required but allowed.		
Vegetated Roof System	Use BMP	Go to BMP Sizing
Evaluation not required but allowed.		

Category 5

BMP	Feasibility	Infeasibility Criteria
Perforated Stub-out Connection		
Trees		
Evaluation not allowed for roof surfaces.		

On-site Stormwater Management Calculator - List Approach

Surface Identification and BMP Evaluation for Parcel-Based Projects

Project No.

6904773-CN

Hard Surface Number

2

Hard Surface Type

Roof

Hard Surface Description

Vegetated Roof 02

Surface Area (sf)

1314

Category 1

(Select 1 BMP from Category 1, order does not matter, or move to Category 2)

BMP	Feasibility	Infeasibility Criteria (see infeasibility criteria tab for full text)
Full Dispersion	Infeasible	14 The minimum native vegetation flowpath length is less than 100 feet.
Infiltration Trench	Infeasible	11 The area available for siting does not meet the minimum horizontal setback requirements (refer to Volume 3, Section 3.2).
Dry Well	Infeasible	11 The area available for siting does not meet the minimum horizontal setback requirements (refer to Volume 3, Section 3.2).

Category 2

BMP	Feasibility	Infeasibility Criteria
Rain Garden	Not Evaluated	
Evaluation not allowed when project requires flow control or water quality treatment or >5000 SF hard surface is infiltrated onsite		
Infiltrating Bioretention	Infeasible	13 The area available for siting does not meet the minimum horizontal setback requirements (refer to Volume 3, Section 3.2).
Rainwater Harvesting - Category 2 Sizing	Not Evaluated	
Evaluation not required but allowed.		
Permeable Pavement Facility	Infeasible	11 The area available for siting does not meet the minimum horizontal setback requirements (refer to Volume 3, Section 3.2).
Permeable Pavement Surface	Not Evaluated	
Evaluation not allowed for roof surfaces.		
Sidewalk/Trail Compost-Amended Strip	Not Evaluated	
Evaluation not allowed for roof surfaces.		

Category 3

BMP	Feasibility	Infeasibility Criteria
Sheet Flow Dispersion	Infeasible	14 The minimum vegetated flow path for sheet flow dispersion cannot be met. Note: A 10 foot flowpath is required to disperse runoff from a contributing flow length of u
Concentrated Flow Dispersion	Not Evaluated	
Evaluation not allowed for roof surfaces.		
Splashblock Downspout Dispersion	Infeasible	14 The vegetated flowpath is less than 50 feet.
Trench Downspout Dispersion	Infeasible	14 The minimum dispersion trench length of 10 feet for every 700 square feet of drainage area cannot be met.

Category 4

BMP	Feasibility	Infeasibility Criteria
Non-Infiltrating Bioretention (NIB)		
Water Quality BMP in lieu of NIB	Not Evaluated	
Evaluation is allowed but not required.		
Rainwater Harvesting - Category 4 Sizing	Not Evaluated	
Evaluation not required but allowed.		
Vegetated Roof System	Use BMP	Go to BMP Sizing
Evaluation not required but allowed.		

Category 5

BMP	Feasibility	Infeasibility Criteria
Perforated Stub-out Connection		
Trees		
Evaluation not allowed for roof surfaces.		

On-site Stormwater Management Calculator - List Approach

Surface Identification and BMP Evaluation for Parcel-Based Projects

Project No.

6904773-CN

Hard Surface Number

3

Hard Surface Type

Roof

Hard Surface Description

Roof 03 - Canopies

Surface Area (sf)

527

Category 1

(Select 1 BMP from Category 1, order does not matter, or move to Category 2)

BMP

Feasibility

Infeasibility Criteria (see infeasibility criteria tab for full text)

Full Dispersion

Infeasible

14 The minimum native vegetation flowpath length is less than 100 feet.

Infiltration Trench

Infeasible

11 The area available for siting does not meet the minimum horizontal setback requirements (refer to Volume 3, Section 3.2).

Dry Well

Infeasible

11 The area available for siting does not meet the minimum horizontal setback requirements (refer to Volume 3, Section 3.2).

Category 2

BMP

Feasibility

Infeasibility Criteria

Rain Garden

Not Evaluated

Evaluation not allowed when project requires flow control or water quality treatment or >5000 SF hard surface is infiltrated onsite

Infiltrating Bioretention

Infeasible

13 The area available for siting does not meet the minimum horizontal setback requirements (refer to Volume 3, Section 3.2).

Rainwater Harvesting - Category 2 Sizing

Not Evaluated

Evaluation not required but allowed.

Permeable Pavement Facility

Infeasible

11 The area available for siting does not meet the minimum horizontal setback requirements (refer to Volume 3, Section 3.2).

Permeable Pavement Surface

Not Evaluated

Evaluation not allowed for roof surfaces.

Sidewalk/Trail Compost-Amended Strip

Not Evaluated

Evaluation not allowed for roof surfaces.

Category 3

BMP

Feasibility

Infeasibility Criteria

Sheet Flow Dispersion

Infeasible

14 The minimum vegetated flow path for sheet flow dispersion cannot be met. Note: A 10 foot flowpath is required to disperse runoff from a contributing flow length of u

Concentrated Flow Dispersion

Not Evaluated

Evaluation not allowed for roof surfaces.

Splashblock Downspout Dispersion

Infeasible

14 The vegetated flowpath is less than 50 feet.

Trench Downspout Dispersion

Infeasible

15 The vegetated flowpath is less than 25 feet.

Category 4

BMP

Feasibility

Infeasibility Criteria

Non-Infiltrating Bioretention (NIB)

Infeasible

6 Installation would require a pump when a pump is not already required to provide site storm drainage.

Water Quality BMP in lieu of NIB

Not Evaluated

Evaluation is allowed but not required.

Rainwater Harvesting - Category 4 Sizing

Not Evaluated

Evaluation not required but allowed.

Vegetated Roof System

Not Evaluated

Evaluation not required but allowed.

Category 5

BMP

Feasibility

Infeasibility Criteria

Perforated Stub-out Connection

Infeasible

11 The area available for siting does not meet the minimum horizontal setback requirements (refer to Volume 3, Section 3.2).

Trees

Evaluation not allowed for roof surfaces.

On-site Stormwater Management Calculator - List Approach

Surface Identification and BMP Evaluation for Parcel-Based Projects

Project No.

6904773-CN

Hard Surface Number

4

Hard Surface Type

Roof

Hard Surface Description

Roof 4 - Misc Roof

Surface Area (sf)

55

Category 1

(Select 1 BMP from Category 1, order does not matter, or move to Category 2)

BMP	Feasibility	Infeasibility Criteria (see infeasibility criteria tab for full text)
Full Dispersion	Infeasible	14 The minimum native vegetation flowpath length is less than 100 feet.
Infiltration Trench	Infeasible	11 The area available for siting does not meet the minimum horizontal setback requirements (refer to Volume 3, Section 3.2).
Dry Well	Infeasible	11 The area available for siting does not meet the minimum horizontal setback requirements (refer to Volume 3, Section 3.2).

Category 2

BMP	Feasibility	Infeasibility Criteria
Rain Garden	Not Evaluated	
Evaluation not allowed when project requires flow control or water quality treatment or >5000 SF hard surface is infiltrated onsite		
Infiltrating Bioretention	Infeasible	13 The area available for siting does not meet the minimum horizontal setback requirements (refer to Volume 3, Section 3.2).
Rainwater Harvesting - Category 2 Sizing	Not Evaluated	
Evaluation not required but allowed.		
Permeable Pavement Facility	Infeasible	11 The area available for siting does not meet the minimum horizontal setback requirements (refer to Volume 3, Section 3.2).
Permeable Pavement Surface	Not Evaluated	
Evaluation not allowed for roof surfaces.		
Sidewalk/Trail Compost-Amended Strip	Not Evaluated	
Evaluation not allowed for roof surfaces.		

Category 3

BMP	Feasibility	Infeasibility Criteria
Sheet Flow Dispersion	Infeasible	14 The minimum vegetated flow path for sheet flow dispersion cannot be met. Note: A 10 foot flowpath is required to disperse runoff from a contributing flow length of u
Concentrated Flow Dispersion	Not Evaluated	
Evaluation not allowed for roof surfaces.		
Splashblock Downspout Dispersion	Infeasible	14 The vegetated flowpath is less than 50 feet.
Trench Downspout Dispersion	Infeasible	14 The minimum dispersion trench length of 10 feet for every 700 square feet of drainage area cannot be met.

Category 4

BMP	Feasibility	Infeasibility Criteria
Non-Infiltrating Bioretention (NIB)	Infeasible	6 Installation would require a pump when a pump is not already required to provide site storm drainage.
Water Quality BMP in lieu of NIB	Not Evaluated	
Evaluation is allowed but not required.		
Rainwater Harvesting - Category 4 Sizing	Not Evaluated	
Evaluation not required but allowed.		
Vegetated Roof System	Not Evaluated	
Evaluation not required but allowed.		

Category 5

BMP	Feasibility	Infeasibility Criteria
Perforated Stub-out Connection	Infeasible	11 The area available for siting does not meet the minimum horizontal setback requirements (refer to Volume 3, Section 3.2).
Trees		
Evaluation not allowed for roof surfaces.		

On-site Stormwater Management Calculator - List Approach

Surface Identification and BMP Evaluation for Parcel-Based Projects

Project No.

6904773-CN

Hard Surface Number

5

Hard Surface Type

Non-Roof

Hard Surface Description

Sidewalk at grade - Fremont

Surface Area (sf)

215

Category 1

(Select 1 BMP from Category 1, order does not matter, or move to Category 2)

BMP	Feasibility	Infeasibility Criteria (see infeasibility criteria tab for full text)
Full Dispersion	Infeasible	14 The minimum native vegetation flowpath length is less than 100 feet.
Infiltration Trench Evaluation is not required but allowed.	Not Evaluated	
Dry Well Evaluation is not required but allowed.	Not Evaluated	

Category 2

BMP	Feasibility	Infeasibility Criteria
Rain Garden Evaluation not allowed when project requires flow control or water quality treatment or >5000 SF hard surface is infiltrated onsite	Not Evaluated	
Infiltrating Bioretention	Infeasible	13 The area available for siting does not meet the minimum horizontal setback requirements (refer to Volume 3, Section 3.2).
Rainwater Harvesting - Category 2 Sizing Evaluation not allowed for non-roof surfaces.	Not Evaluated	
Permeable Pavement Facility	Infeasible	11 The area available for siting does not meet the minimum horizontal setback requirements (refer to Volume 3, Section 3.2).
Permeable Pavement Surface	Infeasible	27 The site is a contaminated site or abandoned landfill.
Sidewalk/Trail Compost-Amended Strip	Infeasible	19 The area available for siting does not meet the minimum horizontal setback requirements (refer to Volume 3, Section 3.2).

Category 3

BMP	Feasibility	Infeasibility Criteria
Sheet Flow Dispersion	Infeasible	14 The minimum vegetated flow path for sheet flow dispersion cannot be met. Note: A 10 foot flowpath is required to disperse runoff from a contributing flow length of u
Concentrated Flow Dispersion	Infeasible	14 The minimum dispersion trench length of 10 feet cannot be met.
Splashblock Downspout Dispersion Evaluation not allowed for non-roof surfaces.	Not Evaluated	
Trench Downspout Dispersion Evaluation not allowed for non-roof surfaces.	Not Evaluated	

Category 4

BMP	Feasibility	Infeasibility Criteria
Non-Infiltrating Bioretention (NIB)	Infeasible	6 Installation would require a pump when a pump is not already required to provide site storm drainage.
Water Quality BMP in lieu of NIB Evaluation is allowed but not required.	Not Evaluated	
Rainwater Harvesting - Category 4 Sizing Evaluation not allowed for non-roof surfaces.	Not Evaluated	
Vegetated Roof System Evaluation not allowed for non-roof surfaces.	Not Evaluated	

Category 5

BMP	Feasibility	Infeasibility Criteria
Perforated Stub-out Connection Evaluation not allowed for non-roof surfaces.	Not Evaluated	
Trees	Infeasible	4 Unable to maintain clearance for required ingress, egress, or ADA pathways.

On-site Stormwater Management Calculator - List Approach

Surface Identification and BMP Evaluation for Parcel-Based Projects

Project No.

6904773-CN

Hard Surface Number

6

Hard Surface Type

Non-Roof

Hard Surface Description

Slab on Grade - Fremont

Surface Area (sf)

127

Category 1

(Select 1 BMP from Category 1, order does not matter, or move to Category 2)

BMP

Feasibility

Infeasibility Criteria (see infeasibility criteria tab for full text)

Full Dispersion

Infeasible

14 The minimum native vegetation flowpath length is less than 100 feet.

Infiltration Trench

Not Evaluated

Dry Well

Not Evaluated

Category 2

BMP

Feasibility

Infeasibility Criteria

Rain Garden

Not Evaluated

Evaluation not allowed when project requires flow control or water quality treatment or >5000 SF hard surface is infiltrated onsite

Infiltrating Bioretention

Infeasible

13 The area available for siting does not meet the minimum horizontal setback requirements (refer to Volume 3, Section 3.2).

Rainwater Harvesting - Category 2 Sizing

Not Evaluated

Evaluation not allowed for non-roof surfaces.

Permeable Pavement Facility

Infeasible

11 The area available for siting does not meet the minimum horizontal setback requirements (refer to Volume 3, Section 3.2).

Permeable Pavement Surface

Infeasible

27 The site is a contaminated site or abandoned landfill.

Sidewalk/Trail Compost-Amended Strip

Infeasible

19 The area available for siting does not meet the minimum horizontal setback requirements (refer to Volume 3, Section 3.2).

Category 3

BMP

Feasibility

Infeasibility Criteria

Sheet Flow Dispersion

Infeasible

14 The minimum vegetated flow path for sheet flow dispersion cannot be met. Note: A 10 foot flowpath is required to disperse runoff from a contributing flow length of u

Concentrated Flow Dispersion

Infeasible

14 The minimum dispersion trench length of 10 feet cannot be met.

Splashblock Downspout Dispersion

Not Evaluated

Evaluation not allowed for non-roof surfaces.

Trench Downspout Dispersion

Not Evaluated

Evaluation not allowed for non-roof surfaces.

Category 4

BMP

Feasibility

Infeasibility Criteria

Non-Infiltrating Bioretention (NIB)

Infeasible

6 Installation would require a pump when a pump is not already required to provide site storm drainage.

Water Quality BMP in lieu of NIB

Not Evaluated

Evaluation is allowed but not required.

Rainwater Harvesting - Category 4 Sizing

Not Evaluated

Evaluation not allowed for non-roof surfaces.

Vegetated Roof System

Not Evaluated

Evaluation not allowed for non-roof surfaces.

Category 5

BMP

Feasibility

Infeasibility Criteria

Perforated Stub-out Connection

Not Evaluated

Trees

Infeasible

4 Unable to maintain clearance for required ingress, egress, or ADA pathways.

On-site Stormwater Management Calculator - List Approach

Surface Identification and BMP Evaluation for Parcel-Based Projects

Project No.

6904773-CN

Hard Surface Number

7

Hard Surface Type

Non-Roof

Hard Surface Description

Driveway off N 44th

Surface Area (sf)

202

Category 1

(Select 1 BMP from Category 1, order does not matter, or move to Category 2)

BMP

Feasibility

Infeasibility Criteria (see infeasibility criteria tab for full text)

Full Dispersion

Infeasible

14 The minimum native vegetation flowpath length is less than 100 feet.

Infiltration Trench

Not Evaluated

Evaluation is not required but allowed.

Dry Well

Not Evaluated

Evaluation is not required but allowed.

Category 2

BMP

Feasibility

Infeasibility Criteria

Rain Garden

Not Evaluated

Evaluation not allowed when project requires flow control or water quality treatment or >5000 SF hard surface is infiltrated onsite

Infiltrating Bioretention

Infeasible

13 The area available for siting does not meet the minimum horizontal setback requirements (refer to Volume 3, Section 3.2).

Rainwater Harvesting - Category 2 Sizing

Not Evaluated

Evaluation not allowed for non-roof surfaces.

Permeable Pavement Facility

Infeasible

11 The area available for siting does not meet the minimum horizontal setback requirements (refer to Volume 3, Section 3.2).

Permeable Pavement Surface

Infeasible

27 The site is a contaminated site or abandoned landfill.

Sidewalk/Trail Compost-Amended Strip

Infeasible

19 The area available for siting does not meet the minimum horizontal setback requirements (refer to Volume 3, Section 3.2).

Category 3

BMP

Feasibility

Infeasibility Criteria

Sheet Flow Dispersion

Infeasible

14 The minimum vegetated flow path for sheet flow dispersion cannot be met. Note: A 10 foot flowpath is required to disperse runoff from a contributing flow length of u

Concentrated Flow Dispersion

Infeasible

14 The minimum dispersion trench length of 10 feet cannot be met.

Splashblock Downspout Dispersion

Not Evaluated

Evaluation not allowed for non-roof surfaces.

Trench Downspout Dispersion

Not Evaluated

Evaluation not allowed for non-roof surfaces.

Category 4

BMP

Feasibility

Infeasibility Criteria

Non-Infiltrating Bioretention (NIB)

Infeasible

6 Installation would require a pump when a pump is not already required to provide site storm drainage.

Water Quality BMP in lieu of NIB

Not Evaluated

Evaluation is allowed but not required.

Rainwater Harvesting - Category 4 Sizing

Not Evaluated

Evaluation not allowed for non-roof surfaces.

Vegetated Roof System

Not Evaluated

Evaluation not allowed for non-roof surfaces.

Category 5

BMP

Feasibility

Infeasibility Criteria

Perforated Stub-out Connection

Not Evaluated

Evaluation not allowed for non-roof surfaces.

Trees

Infeasible

4 Unable to maintain clearance for required ingress, egress, or ADA pathways.

On-site Stormwater Management Calculator - List Approach

Surface Identification and BMP Evaluation for Parcel-Based Projects

Project No.

6904773-CN

Hard Surface Number

8

Hard Surface Type

Non-Roof

Hard Surface Description

Sidewalk at grade - N 44th

Surface Area (sf)

316

Category 1

(Select 1 BMP from Category 1, order does not matter, or move to Category 2)

BMP

Feasibility

Infeasibility Criteria (see infeasibility criteria tab for full text)

Full Dispersion

Infeasible

14 The minimum native vegetation flowpath length is less than 100 feet.

Infiltration Trench

Not Evaluated

Evaluation is not required but allowed.

Dry Well

Not Evaluated

Evaluation is not required but allowed.

Category 2

BMP

Feasibility

Infeasibility Criteria

Rain Garden

Not Evaluated

Evaluation not allowed when project requires flow control or water quality treatment or >5000 SF hard surface is infiltrated onsite

Infiltrating Bioretention

Infeasible

13 The area available for siting does not meet the minimum horizontal setback requirements (refer to Volume 3, Section 3.2).

Rainwater Harvesting - Category 2 Sizing

Not Evaluated

Evaluation not allowed for non-roof surfaces.

Permeable Pavement Facility

Infeasible

11 The area available for siting does not meet the minimum horizontal setback requirements (refer to Volume 3, Section 3.2).

Permeable Pavement Surface

Infeasible

27 The site is a contaminated site or abandoned landfill.

Sidewalk/Trail Compost-Amended Strip

Infeasible

19 The area available for siting does not meet the minimum horizontal setback requirements (refer to Volume 3, Section 3.2).

Category 3

BMP

Feasibility

Infeasibility Criteria

Sheet Flow Dispersion

Infeasible

14 The minimum vegetated flow path for sheet flow dispersion cannot be met. Note: A 10 foot flowpath is required to disperse runoff from a contributing flow length of u

Concentrated Flow Dispersion

Infeasible

14 The minimum dispersion trench length of 10 feet cannot be met.

Splashblock Downspout Dispersion

Not Evaluated

Evaluation not allowed for non-roof surfaces.

Trench Downspout Dispersion

Not Evaluated

Evaluation not allowed for non-roof surfaces.

Category 4

BMP

Feasibility

Infeasibility Criteria

Non-Infiltrating Bioretention (NIB)

Infeasible

6 Installation would require a pump when a pump is not already required to provide site storm drainage.

Water Quality BMP in lieu of NIB

Not Evaluated

Evaluation is allowed but not required.

Rainwater Harvesting - Category 4 Sizing

Not Evaluated

Evaluation not allowed for non-roof surfaces.

Vegetated Roof System

Not Evaluated

Evaluation not allowed for non-roof surfaces.

Category 5

BMP

Feasibility

Infeasibility Criteria

Perforated Stub-out Connection

Not Evaluated

Evaluation not allowed for non-roof surfaces.

Trees

Infeasible

4 Unable to maintain clearance for required ingress, egress, or ADA pathways.

On-site Stormwater Management Calculator - List Approach

Surface Identification and BMP Evaluation for Parcel-Based Projects

Project No.

6904773-CN

Hard Surface Number

9

Hard Surface Type

Non-Roof

Hard Surface Description

Sidewalk - Elevated

Surface Area (sf)

146

Category 1

(Select 1 BMP from Category 1, order does not matter, or move to Category 2)

BMP	Feasibility	Infeasibility Criteria (see infeasibility criteria tab for full text)
Full Dispersion	Infeasible	14 The minimum native vegetation flowpath length is less than 100 feet.
Infiltration Trench Evaluation is not required but allowed.	Not Evaluated	
Dry Well Evaluation is not required but allowed.	Not Evaluated	

Category 2

BMP	Feasibility	Infeasibility Criteria
Rain Garden Evaluation not allowed when project requires flow control or water quality treatment or >5000 SF hard surface is infiltrated onsite	Not Evaluated	
Infiltrating Bioretention	Infeasible	13 The area available for siting does not meet the minimum horizontal setback requirements (refer to Volume 3, Section 3.2).
Rainwater Harvesting - Category 2 Sizing Evaluation not allowed for non-roof surfaces.	Not Evaluated	
Permeable Pavement Facility	Infeasible	11 The area available for siting does not meet the minimum horizontal setback requirements (refer to Volume 3, Section 3.2).
Permeable Pavement Surface	Infeasible	27 The site is a contaminated site or abandoned landfill.
Sidewalk/Trail Compost-Amended Strip	Infeasible	19 The area available for siting does not meet the minimum horizontal setback requirements (refer to Volume 3, Section 3.2).

Category 3

BMP	Feasibility	Infeasibility Criteria
Sheet Flow Dispersion	Infeasible	14 The minimum vegetated flow path for sheet flow dispersion cannot be met. Note: A 10 foot flowpath is required to disperse runoff from a contributing flow length of u
Concentrated Flow Dispersion	Infeasible	15 The vegetated flow path for the dispersion trench is less than 25 feet
Splashblock Downspout Dispersion Evaluation not allowed for non-roof surfaces.	Not Evaluated	
Trench Downspout Dispersion Evaluation not allowed for non-roof surfaces.	Not Evaluated	

Category 4

BMP	Feasibility	Infeasibility Criteria
Non-Infiltrating Bioretention (NIB)	Infeasible	6 Installation would require a pump when a pump is not already required to provide site storm drainage.
Water Quality BMP in lieu of NIB Evaluation is allowed but not required.	Not Evaluated	
Rainwater Harvesting - Category 4 Sizing Evaluation not allowed for non-roof surfaces.	Not Evaluated	
Vegetated Roof System Evaluation not allowed for non-roof surfaces.	Not Evaluated	

Category 5

BMP	Feasibility	Infeasibility Criteria
Perforated Stub-out Connection Evaluation not allowed for non-roof surfaces.	Not Evaluated	
Trees	Use BMP	Go to BMP Sizing

On-site Stormwater Management Calculator - List Approach
BMP Sizing

Version 01-04-2023

More than one surface can drain to the same BMP. For example, a garage roof and driveway may be managed by a single infiltration trench. Please indicate which surfaces are draining to which BMPs in the dropdown menus.

<u>Surface</u>	<u>Area (sf)</u>	<u>Select BMP</u>
1	12,342	Vegetated Roof System #1
2	1,314	Vegetated Roof System #2
3	527	None Feasible
4	55	None Feasible
5	215	None Feasible
6	127	None Feasible
7	202	None Feasible
8	316	None Feasible
9	146	Trees #1

<u>BMP</u>	<u>BMP Facility Inputs</u>	<u>BMP Size and Credit</u>
Vegetated Roof System #1	Roof Area	12,342
Vegetated Area (sf)	Course	Single-Course
Minimum Facility Area 9,874 sf	Media Depth (inch)	4
Vegetated Roof System #2	Roof Area	1,314
Vegetated Area (sf)	Course	Single-Course
Minimum Facility Area 1,051 sf	Media Depth (inch)	8
None Feasible	Contributing Area (sf)	527
None Feasible	Contributing Area (sf)	55
None Feasible	Contributing Area (sf)	215
None Feasible	Contributing Area (sf)	127
None Feasible	Contributing Area (sf)	202
None Feasible	Contributing Area (sf)	316
Trees #1	Contributing Area (sf)	146
	Type	New Deciduous
	Number	3

Infeasibility Criteria

Full Dispersion

- 1 Installation requires removal of an existing tree.
- 2 Installation is prohibited per Regulations for Environmentally Critical Areas (SMC Chapter 25.09).
- 3 Installation would require pumping to a designated point of discharge, but failure of the pump may destabilize a steep slope.
- 4 Unable to maintain a desired access of 36 inches in a required building setback from a property line.
- 5 Unable to maintain clearance for required ingress, egress, or ADA pathways.
- 6 Installation would require a pump when a pump is not already required to provide site storm drainage.
- 7 A licensed professional recommends dispersion not be used anywhere within project site due to reasonable concerns of erosion, slope failure, or flooding.
- 8 The dispersion flow path area does not provide positive drainage.
- 9 The dispersion flowpath area is within a landslide-prone area (SMC, Section 25.09.080).
- 10 The dispersion flowpath area is within 100 feet of a contaminated site or landfill (active or closed).
- 11 The dispersion flowpath area is in a steep slope area (SMC, Section 25.09.020) or within a setback to a steep slope area (calculated as 10 times the height of the steep slope to a 500 foot maximum setback).
- 12 The dispersion flowpath area is within 10 feet of a proposed or existing septic system or drainfield.
- 13 The site has less than a 65 to 10 ratio of the native vegetation area to the impervious area.
- 14 The minimum native vegetation flowpath length is less than 100 feet.

Infiltration Trench

- 1 Installation requires removal of an existing tree.
- 2 Where BMP installation is prohibited per Regulations for Environmentally Critical Areas (SMC Chapter 25.09).
- 3 Installation would require pumping to a designated point of discharge, but failure of the pump may destabilize a steep slope.
- 4 Installation would require a pump when a pump is not already required to provide site storm drainage.
- 5 Infiltration is not recommended due to reasonable concerns about erosion, slope failure, or flooding.
- 6 The 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 or subgrades.
- 7 The area available for siting would threaten shoreline structures such as bulkheads.
- 8 Evaluation of infiltration is not required per the "Infiltration Investigation Map".
- 9 The area available for siting does not allow for overflow conveyance to an approved point of discharge per Volume 3, Section 4.3.2.
- 10 The area available for siting is within a steep slope area or land-slide prone area (or setback) (refer to Volume 3, Section 3.2).
- 11 The area available for siting does not meet the minimum horizontal setback requirements (refer to Volume 3, Section 3.2).
- 12 The area available for siting does not meet the minimum vertical setback requirements (refer to Volume 3, Section 3.2, and Appendix D).
- 13 Infiltration is restricted due to contaminated soil or groundwater (refer to Volume 3, Section 3.2).
- 14 Field testing indicates potential infiltration trench site(s) have a measured underlying soil infiltration rate less than 5 inches per hour (Volume 3, Section 5.4.2).
- 15 Where the site cannot be reasonably designed to locate a catch basin between the infiltration trench and point of connection to the public system.

Drywell

- 1 Installation requires removal of an existing tree.
- 2 Where BMP installation is prohibited per Regulations for Environmentally Critical Areas (SMC Chapter 25.09).
- 3 Installation would require pumping to a designated point of discharge, but failure of the pump may destabilize a steep slope.
- 4 Installation would require a pump when a pump is not already required to provide site storm drainage.
- 5 Infiltration is not recommended due to reasonable concerns about erosion, slope failure, or flooding.
- 6 The 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 or subgrades.
- 7 The area available for siting would threaten shoreline structures such as bulkheads.
- 8 Evaluation of infiltration is not required per the "Infiltration Investigation Map".

- 9 The area available for siting does not allow for overflow conveyance to an approved point of discharge per Volume 3, Section 4.3.2.
- 10 The area available for siting is within a steep slope area or land-slide prone area (or setback) (refer to Volume 3, Section 3.2).
- 11 The area available for siting does not meet the minimum horizontal setback requirements (refer to Volume 3, Section 3.2).
- 12 The area available for siting does not meet the minimum vertical setback requirements (refer to Volume 3, Section 3.2, and Appendix D).
- 13 Infiltration is restricted due to contaminated soil or groundwater (refer to Volume 3, Section 3.2).
- 14 Field testing indicates potential drywell site(s) have a measured underlying soil infiltration rate less than 5 inches per hour (Volume 3, Section 5.4.3).
- 15 Where the site cannot be reasonably designed to locate a catch basin between the drywell and point of connection to the public system.

Rain Garden

- 1 Installation requires removal of an existing tree.
- 2 Where BMP installation is prohibited per Regulations for Environmentally Critical Areas (SMC Chapter 25.09).
- 3 Installation would require pumping to a designated point of discharge, but failure of the pump may destabilize a steep slope.
- 4 Unable to maintain a desired access of 36 inches in a required building setback from a property line.
- 5 Unable to maintain clearance for required ingress, egress, or ADA pathways.
- 6 Installation would require a pump when a pump is not already required to provide site storm drainage.
- 7 Infiltration is not recommended due to reasonable concerns about erosion, slope failure, or flooding.
- 8 The 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 or subgrades.
- 9 The area available for siting would threaten shoreline structures such as bulkheads.
- 10 Evaluation of infiltration is not required per the "Infiltration Investigation Map".
- 11 The area available for siting does not allow for overflow conveyance to an approved point of discharge per Volume 3, Section 4.3.2.
- 12 The area available for siting is within a steep slope area or land-slide prone area (or setback) (refer to Volume 3, Section 3.2).
- 13 The area available for siting does not meet the minimum horizontal setback requirements (refer to Volume 3, Section 3.2).
- 14 The area available for siting does not meet the minimum vertical setback requirements (refer to Volume 3, Section 3.2, and Appendix D).
- 15 Infiltration is restricted due to contaminated soil or groundwater (refer to Volume 3, Section 3.2).
- 16 In the right-of-way, the longitudinal road slope exceeds 4 percent.
- 17 The rain garden would have a linear geometry with a longitudinal slope greater than 8 percent.
- 18 The minimum bottom width of the rain garden (12-inch average) cannot be met due to, but not limited to: encroachment within the critical root zone of an existing tree(s) or minimum setbacks to structures, utilities, or property lines.
- 19 The infiltration area is within the minimum vertical or horizontal clearance from utilities, according to clearances required by the utility owner.
- 20 For projects in the right-of-way, the total rain garden top area would be less than 500 square feet and the project discharges to: A designated receiving water body or, A combined system, or A capacity constrained system which does not drain to a creek wetland or small lake.
- 21 Field testing indicates soils have a measured underlying soil infiltration rate less than 0.3 inches per hour.

Infiltrating Bioretention

- 1 Installation requires removal of an existing tree.
- 2 Where BMP installation is prohibited per Regulations for Environmentally Critical Areas (SMC Chapter 25.09).
- 3 Installation would require pumping to a designated point of discharge, but failure of the pump may destabilize a steep slope.
- 4 Unable to maintain a desired access of 36 inches in a required building setback from a property line.
- 5 Unable to maintain clearance for required ingress, egress, or ADA pathways.
- 6 Installation would require a pump when a pump is not already required to provide site storm drainage.
- 7 Infiltration is not recommended due to reasonable concerns about erosion, slope failure, or flooding.
- 8 The 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 or subgrades.
- 9 The area available for siting would threaten shoreline structures such as bulkheads.
- 10 Evaluation of infiltration is not required per the "Infiltration Investigation Map".

- 11 The area available for siting does not allow for overflow conveyance to an approved point of discharge per Volume 3, Section 4.3.2.
- 12 The area available for siting is within a steep slope area or land-slide prone area (or setback) (refer to Volume 3, Section 3.2).
- 13 The area available for siting does not meet the minimum horizontal setback requirements (refer to Volume 3, Section 3.2).
- 14 The area available for siting does not meet the minimum vertical setback requirements (refer to Volume 3, Section 3.2, and Appendix D).
- 15 Infiltration is restricted due to contaminated soil or groundwater (refer to Volume 3, Section 3.2).
- 16 The infiltrating bioretention facility would have a linear geometry with a longitudinal slope greater than 8 percent.
- 17 The minimum bottom width of the infiltrating bioretention facility (2 feet for facilities with vertical sides and 18 inch average for facilities with sloped sides) cannot be met due to, but not limited to: encroachment within the critical root zone of an existing tree(s) or minimum setbacks to structures, utilities, or property lines.
- 18 The infiltration area is within the minimum vertical and horizontal clearance from utilities, according to clearances required by the utility owner.
- 19 Field testing indicates soils have a measured underlying soil infiltration rate less than 0.3 inches per hour.
- 20 Field testing indicates soils have a measured underlying soil infiltration rate less than 0.6 inches per hour and an underdrain cannot be installed per the design criteria.
- 21 The facility with an underdrain would route underdrained water to a nutrient-critical receiving water.
- 22 In the right-of-way, installation requires a vertical walled facility.

Rainwater Harvesting

- 1 Installation requires removal of an existing tree.
- 2 Installation is prohibited per Regulations for Environmentally Critical Areas (SMC Chapter 25.09).
- 3 Installation would require pumping to a designated point of discharge, but failure of the pump may destabilize a steep slope.
- 4 Unable to maintain a desired access of 36 inches in a required building setback from a property line.
- 5 Unable to maintain clearance for required ingress, egress, or ADA pathways.
- 6 Installation would require a pump when a pump is not already required to provide site storm drainage. (Requiring a pump as the result of using the Rainwater Harvesting BMP does not make this BMP infeasible.)
- 7 Project lacks non-pollution-generating roof from which to harvest rainwater.
- 8 Non-potable water demand is insufficient to meet the On-site Performance Standard per modeling conducted in accordance with Volume 3, Section 5.5.1.6.
- 9 Installation is not economically feasible based on reasonable consideration of financial cost (e.g., roof area is less than 20,000 sf or the ratio of roof area to average daily rainwater demand is less than 10,000 square feet/gpm) (refer to Appendix H). Documentation is required.

Permeable Pavement Facility

- 1 Installation requires removal of an existing tree.
- 2 Where BMP installation is prohibited per Regulations for Environmentally Critical Areas (SMC Chapter 25.09).
- 3 Installation would require pumping to a designated point of discharge, but failure of the pump may destabilize a steep slope.
- 4 Installation would require a pump when a pump is not already required to provide site storm drainage.
- 5 Infiltration is not recommended due to reasonable concerns about erosion, slope failure, or flooding.
- 6 The 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 or subgrades.
- 7 The area available for siting would threaten shoreline structures such as bulkheads.
- 8 Evaluation of infiltration is not required per the "Infiltration Investigation Map".
- 9 The area available for siting does not allow for overflow conveyance to an approved point of discharge per Volume 3, Section 4.3.2.
- 10 The area available for siting is within a steep slope area or land-slide prone area (or setback) (refer to Volume 3, Section 3.2).
- 11 The area available for siting does not meet the minimum horizontal setback requirements (refer to Volume 3, Section 3.2).
- 12 The area available for siting does not meet the minimum vertical setback requirements (refer to Volume 3, Section 3.2, and Appendix D).
- 13 Infiltration is restricted due to contaminated soil or groundwater (refer to Volume 3, Section 3.2).
- 14 Infiltrating or ponding water below pavement area would compromise adjacent pavements.
- 15 Fill soils are used that can become unstable when saturated.
- 16 The permeable pavement design does not provide sufficient strength to support heavy loads in areas with "industrial activity" as identified in 40 CFR 122.26(b)(14).

- 17 The subgrade slope exceeds 6 percent after reasonable efforts to grade.
- 18 The permeable pavement wearing course slope exceeds 6 percent after reasonable efforts to grade.
- 19 For projects in the right-of-way, the permeable pavement surface area would be less than 2,000 square feet of contiguous pavement and the project discharges to: a designated receiving water body, a combined system, or a capacity constrained system which does not drain to a creek wetland or small lake.
- 20 The anticipated mature tree spread (based on tree species) would overhang more than 50 percent of permeable pavement area.
- 21 The pavement is over a structure, such as, but not limited to: parking garages, box culverts, and bridges.
- 22 The pavement is subject to long-term excessive sediment deposition (e.g., construction and landscaping material yards).
- 23 Underlying soils are unsuitable for supporting traffic loads when saturated (e.g., a residential access road has a California Bearing Ratio of 5 percent or less).
- 24 Field testing indicates soils have a measured underlying soil infiltration rate less than 0.3 inches per hour.
- 25 Pavement is replacing an existing pollution-generating hard surface in the right-of-way.
- 26 The street type is classified as arterial or collector rather than local access. Refer to RCW 35.78.010, RCW 36.86.070, and RCW 47.05.021. Note: This infeasibility criterion does not extend to sidewalks and other non-traffic bearing surfaces associated with the collector or arterial.
- 27 Streets that receive more than very low traffic volumes, and areas having more than very low truck traffic. Streets with a projected average daily traffic volume of 400 vehicles or less are very low volume roads (AASHTO, 2001)(U.S. Dept. of Transportation, 2013). Areas with very low truck traffic volumes are streets 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.
- 28 The pavement area is defined as a "high use site" in SMC, Section 22.801.090.
- 29 In areas with "industrial activity" as identified in 40 CFR 122.26(b)(14).
- 30 Where the risk of concentrated pollutant spills is more likely, including, but not limited to, gas stations, truck stops, and industrial chemical storage sites.
- 31 In areas where routine, heavy roadway applications of sand occur in frequent snow zones to maintain traction during weeks of snow and ice accumulation, including sidewalks within 7 feet of roadways with sand application.
- 32 Where runoff from unstabilized erodible areas would occur without presettling.
- 33 The areas contributing runoff to the permeable pavement facilities exceed the maximum run-on limits: Pollution-generating impervious surfaces (e.g., roadways, parking lots) exceed the maximum run-on area ratio of 2:1, Non-pollution generating impervious surfaces (e.g., roofs, sidewalks) and stabilized pervious surfaces exceed the maximum run-on area ratio of 5:1
- 34 The Director has determined that permeable pavement in active zones of a skate park, bike park, or sport court violates safety standards.

Permeable Pavement Surface

- 1 Installation requires removal of an existing tree.
- 2 Where BMP installation is prohibited per Regulations for Environmentally Critical Areas (SMC Chapter 25.09).
- 3 Installation would require pumping to a designated point of discharge, but failure of the pump may destabilize a steep slope.
- 4 Unable to maintain a desired access of 36 inches in a required building setback from a property line.
- 5 Unable to maintain clearance for required ingress, egress, or ADA pathways.
- 6 Installation would require a pump when a pump is not already required to provide site storm drainage.
- 7 Infiltrating or ponding water below pavement area would compromise adjacent pavements.
- 8 Fill soils are used that can become unstable when saturated.
- 9 The permeable pavement design does not provide sufficient strength to support heavy loads in areas with "industrial activity" as identified in 40 CFR 122.26(b)(14).
- 10 The subgrade slope exceeds 6 percent after reasonable efforts to grade.
- 11 The permeable pavement wearing course slope exceeds 6 percent after reasonable efforts to grade.
- 12 For projects in the right-of-way, the permeable pavement surface area would be less than 2,000 square feet of contiguous pavement and the project discharges to: a designated receiving water body, a combined system, or a capacity constrained system which does not drain to a creek wetland or small lake.
- 13 The anticipated mature tree spread (based on tree species) would overhang more than 50 percent of permeable pavement area.
- 14 The pavement is over a structure, such as, but not limited to: parking garages, box culverts, and bridges.
- 15 The pavement is subject to long-term excessive sediment deposition (e.g., construction and landscaping material yards).
- 16 Underlying soils are unsuitable for supporting traffic loads when saturated (e.g., a residential access road has a California Bearing Ratio of 5 percent or less).
- 17 Field testing indicates soils have a measured underlying soil infiltration rate less than 0.3 inches per hour.

- 18 Pavement is replacing an existing pollution-generating hard surface in the right-of-way.
- 19 The street type is classified as arterial or collector rather than local access. Refer to RCW 35.78.010, RCW 36.86.070, and RCW 47.05.021. Note: This infeasibility criterion does not extend to sidewalks and other non-traffic bearing surfaces associated with the collector or arterial.
- 20 Streets that receive more than very low traffic volumes, and areas having more than very low truck traffic. Streets with a projected average daily traffic volume of 400 vehicles or less are very low volume roads (AASHTO, 2001)(U.S. Dept. of Transportation, 2013). Areas with very low truck traffic volumes are streets 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.
- 21 The pavement area is defined as a "high use site" in SMC, Section 22.801.090.
- 22 In areas with "industrial activity" as identified in 40 CFR 122.26(b)(14).
- 23 Where the risk of concentrated pollutant spills is more likely, including, but not limited to, gas stations, truck stops, and industrial chemical storage sites.
- 24 In areas where routine, heavy roadway applications of sand occur in frequent snow zones to maintain traction during weeks of snow and ice accumulation, including sidewalks within 7 feet of roadways with sand application.
- 25 Where runoff from unstabilized erodible areas would occur without presettling.
- 26 Field testing indicates soils have a measured underlying soil infiltration rate less than 0.3 inches per hour (Note: field infiltration tests are not required for permeable pavement surfaces, but must be used to demonstrate infeasibility).

- 27 The site is a contaminated site or abandoned landfill.
- 28 Installation is within 10 feet of a petroleum, chemical, or liquid hazardous waste storage tank or connecting underground pipes.
- 29 Run-on from an adjacent impervious area is greater than 10 percent of the permeable pavement surface area.
- 30 A licensed professional (as defined in Appendix D, Section D-1) recommends permeable pavement not be used anywhere within the project site due to reasonable concerns of erosion, slope failure, or flooding (requires a signed and stamped written determination based on site-specific conditions from a licensed professional).
- 31 The Director has determined that permeable pavement in active zones of a skate park, bike park, or sport court violates safety standards.
- 32 Subsurface investigation demonstrate groundwater or hydraulically-restrictive layer is too shallow per the Minimum Vertical Separation table.

Sidewalk/Trail Compost-Amended Strip

- 1 Installation requires removal of an existing tree.
- 2 Installation is prohibited per Regulations for Environmentally Critical Areas (SMC Chapter 25.09).
- 3 Installation would require pumping to a designated point of discharge, but failure of the pump may destabilize a steep slope.
- 4 Unable to maintain a desired access of 36 inches in a required building setback from a property line.
- 5 Unable to maintain clearance for required ingress, egress, or ADA pathways.
- 6 Installation would require a pump when a pump is not already required to provide site storm drainage.
- 7 A licensed professional recommends dispersion not be used anywhere within project site due to reasonable concerns of erosion, slope failure, or flooding.
- 8 The dispersion flow path area does not provide positive drainage.
- 9 The dispersion flowpath area is within a landslide-prone area (SMC, Section 25.09.080).
- 10 The dispersion flowpath area is within 100 feet of a contaminated site or landfill (active or closed).
- 11 The dispersion flowpath area is in a steep slope area (SMC, Section 25.09.020) or within a setback to a steep slope area (calculated as 10 times the height of the steep slope to a 500 foot maximum setback).
- 12 The dispersion flowpath area is within 10 feet of a proposed or existing septic system or drainfield.
- 13 Infiltration is not recommended due to reasonable concerns about erosion, slope failure, or flooding.
- 14 The 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 or subgrades.
- 15 The area available for siting would threaten shoreline structures such as bulkheads.
- 16 Evaluation of infiltration is not required per the "Infiltration Investigation Map".
- 17 The area available for siting does not allow for overflow conveyance to an approved point of discharge per Volume 3, Section 4.3.2.
- 18 The area available for siting is within a steep slope area or land-slide prone area (or setback) (refer to Volume 3, Section 3.2).
- 19 The area available for siting does not meet the minimum horizontal setback requirements (refer to Volume 3, Section 3.2).
- 20 The area available for siting does not meet the minimum vertical setback requirements (refer to Volume 3, Section 3.2, and Appendix D).

- 21 Infiltration is restricted due to contaminated soil or groundwater (refer to Volume 3, Section 3.2).
- 22 The flowpath downstream of the Sidewalk/Trail Compost-Amended Strip is within 10 feet of a proposed or existing septic system or drainfield, as measured from the toe of the Sidewalk/Trail Compost-Amended Strip slope.
- 23 The sidewalk or trail to be dispersed exceeds a lateral slope of 5 percent or a longitudinal slope of 8 percent.
- 24 The sidewalk or trail to be dispersed has a lateral slope of less than 1 percent.
- 25 Field testing indicates underlying soils have a design soil infiltration rate less than 0.15 inch per hour. Note that field infiltration tests are not required for Sidewalk/Trail Compost-Amended Strip, but must be used to demonstrate infeasibility.
- 26 The minimum Sidewalk/Trail Compost-Amended Strip design criteria cannot be met.

Sheet Flow Dispersion

- 1 Installation requires removal of an existing tree.
- 2 Where BMP installation is prohibited per Regulations for Environmentally Critical Areas (SMC Chapter 25.09).
- 3 Installation would require pumping to a designated point of discharge, but failure of the pump may destabilize a steep slope.
- 4 Unable to maintain a desired access of 36 inches in a required building setback from a property line.
- 5 Unable to maintain clearance for required ingress, egress, or ADA pathways.
- 6 Installation would require a pump when a pump is not already required to provide site storm drainage.
- 7 A licensed professional recommends dispersion not be used anywhere within project site due to reasonable concerns of erosion, slope failure, or flooding.
- 8 The dispersion flow path area does not provide positive drainage.
- 9 The dispersion flowpath area is within a landslide-prone area (SMC, Section 25.09.080).
- 10 The dispersion flowpath area is within 100 feet of a contaminated site or landfill (active or closed).
- 11 The dispersion flowpath area is in a steep slope area (SMC, Section 25.09.020) or within a setback to a steep slope area (calculated as 10 times the height of the steep slope to a 500 foot maximum setback).
- 12 The dispersion flowpath area is within 10 feet of a proposed or existing septic system or drainfield.
- 13 The area to be dispersed (e.g., driveway, patio) exceeds a slope of 15 percent.
- 14 The minimum vegetated flow path for sheet flow dispersion cannot be met. Note: A 10 foot flowpath is required to disperse runoff from a contributing flow length of up to 20 feet. An additional 10 feet of flow path is required for each additional 20 feet of contributing flow path or fraction thereof. Refer to Volume 3, Figure 5.5.
- 15 The flowpath does not meet the minimum horizontal setback requirements to property lines, structures and other flowpaths (refer to Volume 3, Section 5.3.5).

Concentrated Dispersion

- 1 Installation requires removal of an existing tree.
- 2 Where BMP installation is prohibited per Regulations for Environmentally Critical Areas (SMC Chapter 25.09).
- 3 Installation would require pumping to a designated point of discharge, but failure of the pump may destabilize a steep slope.
- 4 Unable to maintain a desired access of 36 inches in a required building setback from a property line.
- 5 Unable to maintain clearance for required ingress, egress, or ADA pathways.
- 6 Installation would require a pump when a pump is not already required to provide site storm drainage.
- 7 A licensed professional recommends dispersion not be used anywhere within project site due to reasonable concerns of erosion, slope failure, or flooding.
- 8 The dispersion flow path area does not provide positive drainage.
- 9 The dispersion flowpath area is within a landslide-prone area (SMC, Section 25.09.080).
- 10 The dispersion flowpath area is within 100 feet of a contaminated site or landfill (active or closed).
- 11 The dispersion flowpath area is in a steep slope area (SMC, Section 25.09.020) or within a setback to a steep slope area (calculated as 10 times the height of the steep slope to a 500 foot maximum setback).
- 12 The dispersion flowpath area is within 10 feet of a proposed or existing septic system or drainfield.
- 13 There are no concentrated flows to disperse.
- 14 The minimum dispersion trench length of 10 feet cannot be met.
- 15 The vegetated flow path for the dispersion trench is less than 25 feet
- 16 The vegetated flow path for a rock pad is less than 50 feet.
- 17 Greater than 700 square feet of surface area drains to the BMP.
- 18 The flowpath does not meet the minimum horizontal setback requirements to property lines, structures and other flowpaths (refer to Volume 3, Section 5.3.6).

Splashblock Downspout Dispersion

- 1 Installation requires removal of an existing tree.
- 2 Where BMP installation is prohibited per Regulations for Environmentally Critical Areas (SMC Chapter 25.09).
- 3 Installation would require pumping to a designated point of discharge, but failure of the pump may destabilize a steep slope.
- 4 Unable to maintain a desired access of 36 inches in a required building setback from a property line.
- 5 Unable to maintain clearance for required ingress, egress, or ADA pathways.

- 6 Installation would require a pump when a pump is not already required to provide site storm drainage.
- 7 A licensed professional recommends dispersion not be used anywhere within project site due to reasonable concerns of erosion, slope failure, or flooding.
- 8 The dispersion flow path area does not provide positive drainage.
- 9 The dispersion flowpath area is within a landslide-prone area (SMC, Section 25.09.080).
- 10 The dispersion flowpath area is within 100 feet of a contaminated site or landfill (active or closed).
- 11 The dispersion flowpath area is in a steep slope area (SMC, Section 25.09.020) or within a setback to a steep slope area (calculated as 10 times the height of the steep slope to a 500 foot maximum setback).
- 12 The dispersion flowpath area is within 10 feet of a proposed or existing septic system or drainfield.
- 13 There are no downspouts.
- 14 The vegetated flowpath is less than 50 feet.
- 15 Greater than 700 square feet of surface area drains to the BMP.
- 16 The flowpath does not meet the minimum horizontal setback requirements to property lines, structures and other flowpaths (refer to Volume 3, Section 5.3.3).

Trench Downspout Dispersion

- 1 Installation requires removal of an existing tree.
- 2 Where BMP installation is prohibited per Regulations for Environmentally Critical Areas (SMC Chapter 25.09).
- 3 Installation would require pumping to a designated point of discharge, but failure of the pump may destabilize a steep slope.
- 4 Unable to maintain a desired access of 36 inches in a required building setback from a property line.
- 5 Unable to maintain clearance for required ingress, egress, or ADA pathways.
- 6 Installation would require a pump when a pump is not already required to provide site storm drainage.
- 7 A licensed professional recommends dispersion not be used anywhere within project site due to reasonable concerns of erosion, slope failure, or flooding.
- 8 The dispersion flow path area does not provide positive drainage.
- 9 The dispersion flowpath area is within a landslide-prone area (SMC, Section 25.09.080).
- 10 The dispersion flowpath area is within 100 feet of a contaminated site or landfill (active or closed).
- 11 The dispersion flowpath area is in a steep slope area (SMC, Section 25.09.020) or within a setback to a steep slope area (calculated as 10 times the height of the steep slope to a 500 foot maximum setback).
- 12 The dispersion flowpath area is within 10 feet of a proposed or existing septic system or drainfield.
- 13 There are no downspouts.
- 14 The minimum dispersion trench length of 10 feet for every 700 square feet of drainage area cannot be met.
- 15 The vegetated flowpath is less than 25 feet.
- 16 The flowpath is within the setbacks to property lines, structures and other flowpaths (refer to Volume 3, Section 5.3.4).

Non-infiltrating Bioretention

- 1 Installation requires removal of an existing tree.
- 2 Where BMP installation is prohibited per Regulations for Environmentally Critical Areas (SMC Chapter 25.09).
- 3 Installation would require pumping to a designated point of discharge, but failure of the pump may destabilize a steep slope.
- 4 Unable to maintain a desired access of 36 inches in a required building setback from a property line.
- 5 Unable to maintain clearance for required ingress, egress, or ADA pathways.
- 6 Installation would require a pump when a pump is not already required to provide site storm drainage.
- 7 The minimum bottom width of the non-infiltrating bioretention facility (2 feet) cannot be met due to, but not limited to: encroachment within the critical root zone of an existing tree(s), minimum setbacks to structures / utilities, or project limits/planting strip too small.
- 8 Minimum vertical and horizontal clearances from utilities are unachievable as required by utility owner.
- 9 The facility would route underdrained water to a nutrient-critical receiving water.
- 10 The area available for siting is within a setback equal to the height of the slope to a maximum of 50 feet from the top of steep slope and known landslide area.
- 11 The BMP would be located on a structure or roof that cannot provide sufficient structural support for the BMP.
- 12 Less than 1 foot between the liner and seasonal high groundwater elevation.

Vegetated Roof

- 1 Installation requires removal of an existing tree.
- 2 Where BMP installation is prohibited per Regulations for Environmentally Critical Areas (SMC Chapter 25.09).
- 3 Installation would require pumping to a designated point of discharge, but failure of the pump may destabilize a steep slope.
- 4 Unable to maintain a desired access of 36 inches in a required building setback from a property line.
- 5 Unable to maintain clearance for required ingress, egress, or ADA pathways.
- 6 Installation would require a pump when a pump is not already required to provide site storm drainage.
- 7 Project does not include a roof.

- 8 Roof design has a slope less than 1 degree (0.2:12) or greater than 10 degrees (2:12).
- 9 Installation is not economically feasible based on reasonable consideration of financial cost (refer to Appendix H). Documentation is required.
- 10 This portion of the roof is an amenity area subject to pedestrian use (e.g. balcony, patio, walkway, pet runs, etc.).
- 11 The portion of the roof is required for HVAC equipment and/or maintenance access ways (e.g., window washing, HVAC maintenance, etc.).
- 12 This portion of the roof is completely covered with Solar Panels.

Perforated Stub-out Connection

- 1 Installation requires removal of an existing tree.
- 2 Where BMP installation is prohibited per Regulations for Environmentally Critical Areas (SMC Chapter 25.09).
- 3 Installation would require pumping to a designated point of discharge, but failure of the pump may destabilize a steep slope.
- 4 Installation would require a pump when a pump is not already required to provide site storm drainage.
- 5 Infiltration is not recommended due to reasonable concerns about erosion, slope failure, or flooding.
- 6 The 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 or subgrades.
- 7 The area available for siting would threaten shoreline structures such as bulkheads.
- 8 Evaluation of infiltration is not required per the "Infiltration Investigation Map".
- 9 The area available for siting does not allow for overflow conveyance to an approved point of discharge per Volume 3, Section 4.3.2.
- 10 The area available for siting is within a steep slope area or land-slide prone area (or setback) (refer to Volume 3, Section 3.2).
- 11 The area available for siting does not meet the minimum horizontal setback requirements (refer to Volume 3, Section 3.2).
- 12 The area available for siting does not meet the minimum vertical setback requirements (refer to Volume 3, Section 3.2, and Appendix D).
- 13 Infiltration is restricted due to contaminated soil or groundwater (refer to Volume 3, Section 3.2).
- 14 The location for the perforated pipe portion of the system is under impervious or heavily compacted (e.g., driveways and parking areas) surfaces.
- 15 The minimum perforated stub-out length of 10 feet per 5,000 square feet of contributing roof area cannot be met.
- 16 Where the site cannot be reasonably designed to locate a catch basin between the perforated stub-out and point of connection to the public system.

Trees

- 1 Installation requires removal of an existing tree.
- 2 Where BMP installation is prohibited per Regulations for Environmentally Critical Areas (SMC Chapter 25.09).
- 3 Unable to maintain a desired access of 36 inches in a required building setback from a property line.
- 4 Unable to maintain clearance for required ingress, egress, or ADA pathways.
- 5 The mature height, size, and/or rooting depth is not compatible with Medium and Large trees listed in the current Seattle Master Tree List.

Single Family Residential Cistern

- 1 Installation requires removal of an existing tree.
- 2 Where BMP installation is prohibited per Regulations for Environmentally Critical Areas (SMC Chapter 25.09).
- 3 Installation would require pumping to a designated point of discharge, but failure of the pump may destabilize a steep slope.
- 4 Unable to maintain a desired access of 36 inches in a required building setback from a property line,
- 5 Unable to maintain clearance for required ingress, egress, or ADA pathways.
- 6 Installation would require a pump when a pump is not already required to provide site storm drainage.
- 7 Project does not include non-pollution generating surfaces.
- 8 The SFR cistern would be within restricted setbacks.

Exhibit A: On-site Stormwater Management Summary Sheet

Attach to the Memorandum of Drainage Control

This information is taken from the Drainage Control Plan approved as part of a building, site work or master use plan.

Project Information

Site Address	4401 Fremont Ave N
SDCI Project Number	6904773-CN
Project Type	Parcel-Based
Total Site Area	16,469 sf
Existing Hard Surface Area	15,000 sf
Total New plus Replaced Hard Surface Area	15,244 sf
Total New and/or Replaced Lawn and Landscaping	1,225 sf
Undisturbed and protected site area	0 sf

Site Information

Approved Point of Stormwater Discharge	Public Storm Drain Main
Drainage Basin	Designated Receiving Water
Approved Point of Wastewater Discharge	Public Sanitary Sewer Main
Approved Point of Sub-Surface Discharge	Public Storm Drain Main
Flow Control (See Exhibit B if required)	
Flow Control is required	No
Flow Control Standard(s)	
Water Quality Treatment (See Exhibit C if required)	
Water Quality Treatment is required	Yes
Water Quality Treatment Standard(s)	Basic
Structural Source Control is required (See Exhibit D if required)	No

On-site Stormwater Management

<u>Surface</u>	<u>Description</u>	<u>On-site BMP</u>	<u>Contrib. Area (sf)</u>	<u>Facility Size (sf)</u>	<u>Facility Configuration</u>
1	Roof:Vegetated Roof 01	Vegetated Roof System #1	12342 sf	9,990 sf	4 inch Single-Course
2	Roof:Vegetated Roof 02	Vegetated Roof System #2	1314 sf	1,094 sf	8 inch Single-Course
3	Roof:Roof 03 - Canopies	None Feasible	527 sf	-	
4	Roof:Roof 4 - Misc Roof	None Feasible	55 sf	-	
5	Surface:Sidewalk at grade - Fremont	None Feasible	215 sf	-	
6	Surface:Slab on Grade - Fremont	None Feasible	127 sf	-	
7	Surface:Driveway off N 44th	None Feasible	202 sf	-	
8	Surface:Sidewalk at grade - N 44th	None Feasible	316 sf	-	
9	Surface:Sidewalk - Elevated	Trees	146 sf	-	3 New Deciduous

