

## Stormwater Minimum Requirements

### *What is On-Site Stormwater Management?*

On-site stormwater management is a stormwater and land use management strategy that mimics how water at a site would naturally react prior to development, and uses design techniques for infiltration, filtration, storage, evaporation, and transpiration. Instead of conveying and managing/treating stormwater in large facilities located at the bottom of drainage areas, Low Impact Development (LID) addresses stormwater through small, distributed features located at the lot level.

### *What are Best Management Practices?*

A best management practice (BMP) is a structural or management practice designed to prevent or reduce the release of pollutants from stormwater through infiltration, filtration, storage, evaporation, and/or transpiration. Stormwater management BMPs are control measures taken to mitigate changes to both quantity and quality of urban runoff caused through changes to land use.

### *LID BMP Types*

LIDs provide many benefits to the communities they serve. The designed BMPs can make the city streets and sidewalks be more aesthetically pleasing while simultaneously reducing flooding, improve water quality, and recharge the groundwater table.



Permeable Pavement



Bioretention Swale



Rain Garden



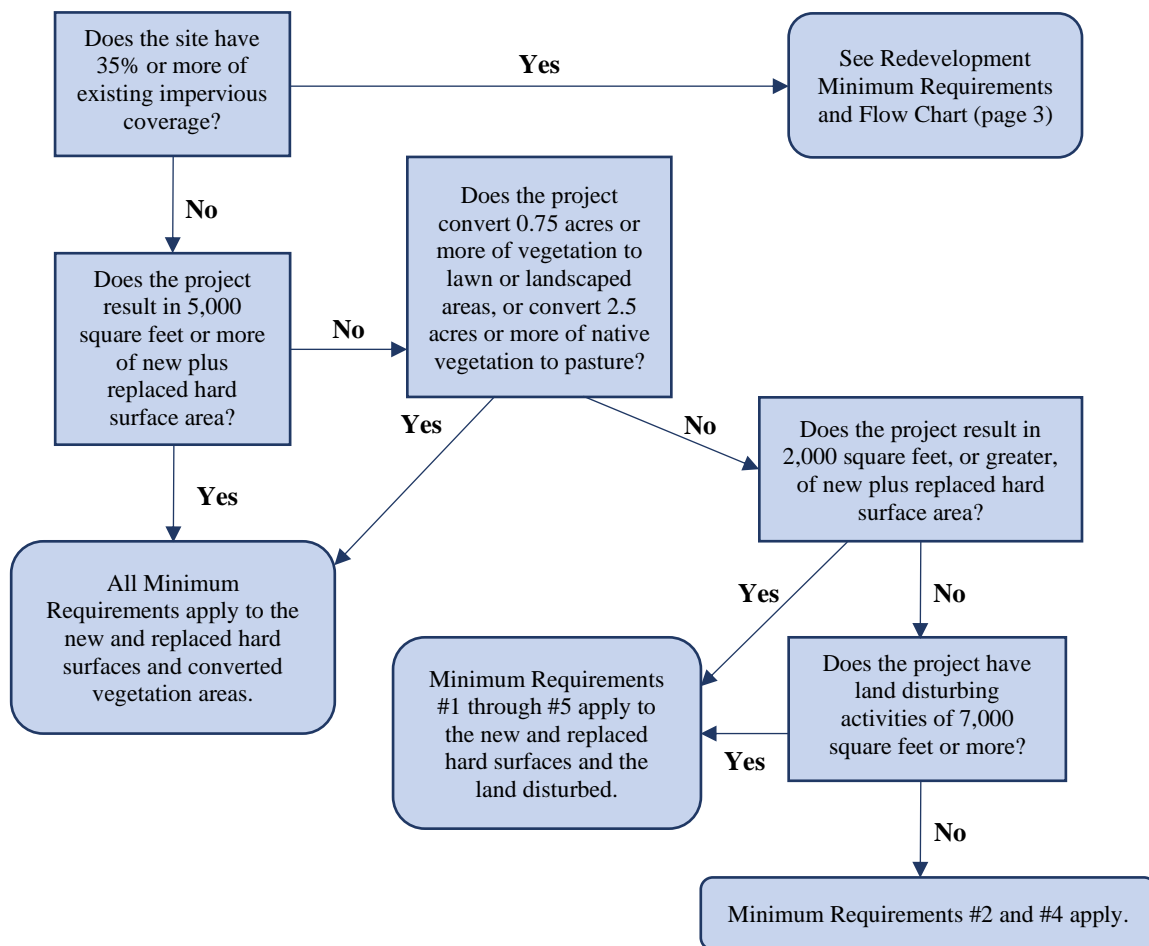
Detention Ponds

## Stormwater Minimum Requirements

There are **Minimum Requirements (MRs)** for all development and redevelopment projects. Typically, small scale projects must complete MR #1 through #5 and larger projects address all requirements #1 through #10. The following flow charts outline which MR are required for each project.

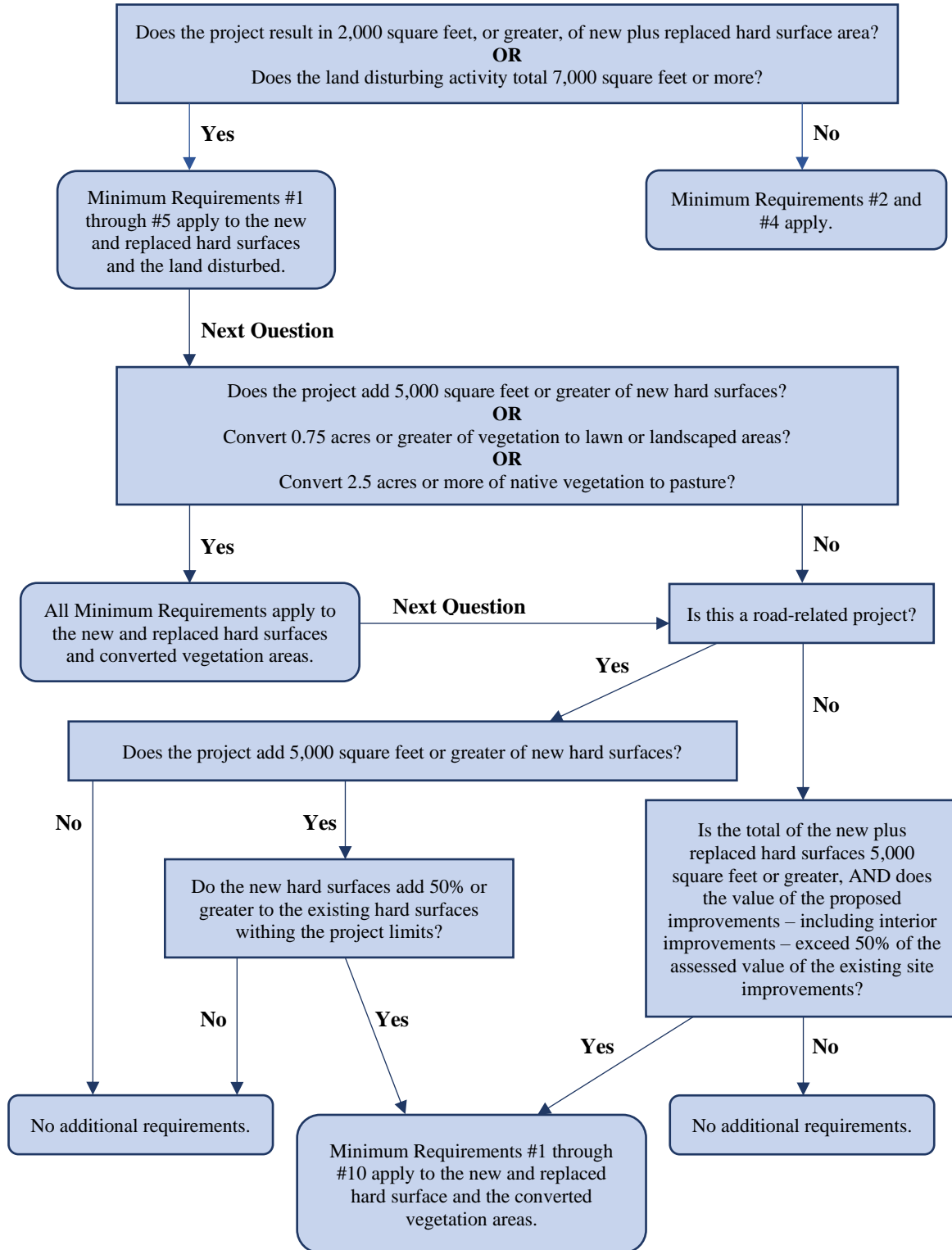
<p><b>MR #1</b> - Stormwater Site Plans</p> <p><b>MR #2</b> - Construction Stormwater Pollution Prevention Plan</p> <p><b>MR #3</b> - Source Control</p> <p><b>MR #4</b> - Preservation of Natural Drainage Systems and Outfalls</p> <p><b>MR #5</b> - On-Site Stormwater Management</p>	<p><b>MR #6</b> - Runoff Treatment</p> <p><b>MR #7</b> - Flow Control</p> <p><b>MR #8</b> - Wetlands Protection</p> <p><b>MR #9</b> - Operation and Maintenance</p> <p><b>MR #10</b> - Financial Liability</p>
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### Start Here for All Development:



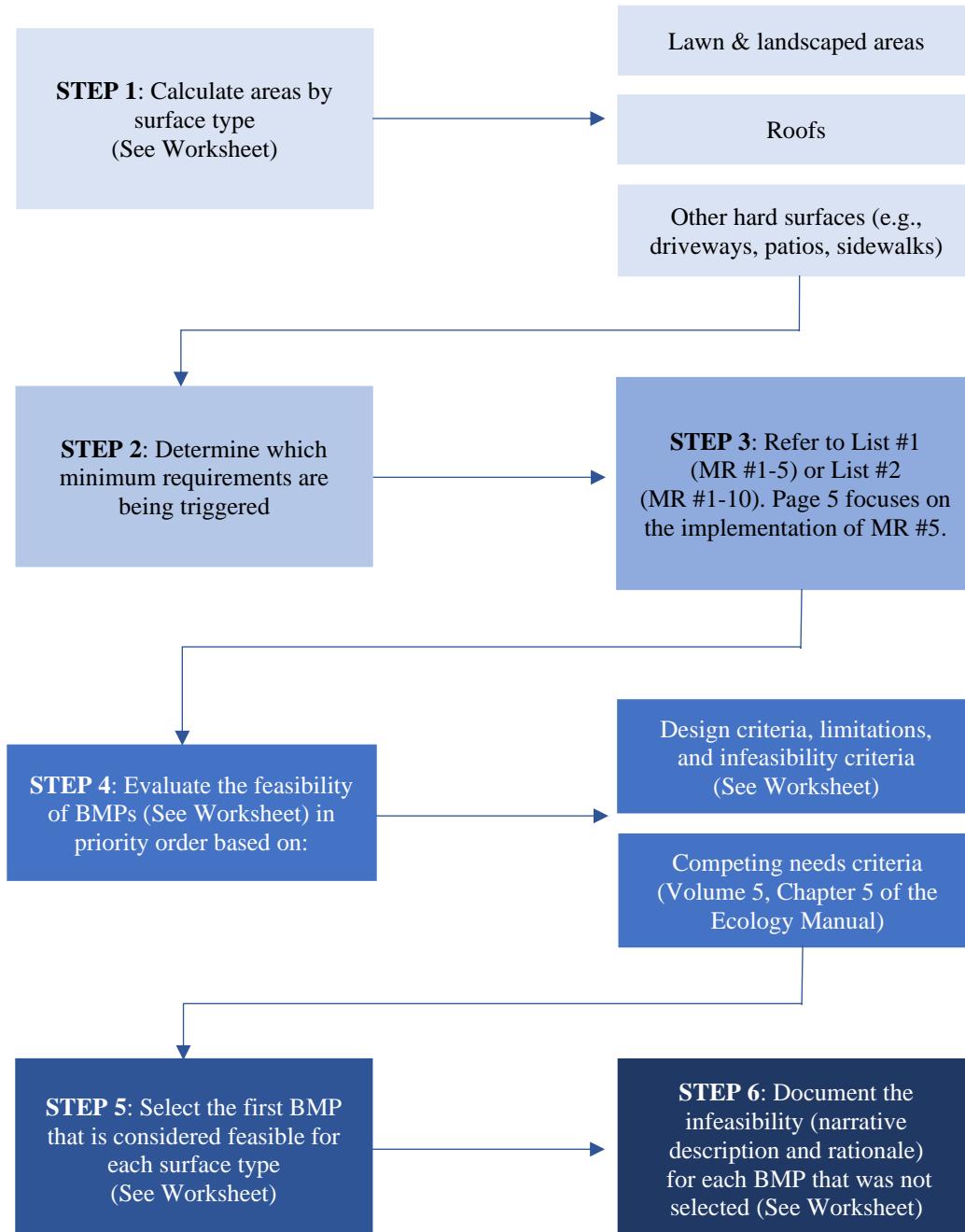
**Stormwater Minimum Requirements**

**Redevelopment Minimum Requirements**



## Stormwater Minimum Requirements

### MR #5 Implementation - On-Site Stormwater Management Worksheet A



## Stormwater Minimum Requirements

### MR #5 - On-Site Stormwater Management

#### Expansion of STEP 3

How stormwater runoff should be permanently managed on your site is dependent on the physical location of your project and your project site characteristics. Projects that trigger minimum requirements #1 through #5 are required to use **LIST 1**. Projects that trigger minimum requirements #1 through #10 are required to use **LIST 2**. Use the flow chart presented on pages 2 and 3 to determine which requirements are triggered. Once the appropriate List is determined, the BMPs under each category shall be considered for use in priority order. The first feasible BMP must be employed under each category. If a BMP is determined to be infeasible, move down to the next BMP on the list and document your justification via attached worksheet.

#### List #1 – Projects Triggering MR #1-5

For each category, select the first feasible item on the list:

##### Category A: Lawn and landscaped areas

1. Soil preservation and amendment

##### Category B: Roofs

1. 65/10 dispersion or downspout infiltration
2. Rain gardens or bioretention
3. Downspout dispersion systems
4. Perforated stub-out connections

##### Category C: Other hard surfaces

1. 65/10 dispersion
2. Permeable pavement, rain gardens, or bioretention
3. Sheet flow dispersion or concentrated flow dispersion

#### List #2 - Projects Triggering MR #1-10

For each category, select the first feasible item on the list:

##### Category A: Lawn and landscaped areas

1. Post-construction soil quality and depth

##### Category B: Roofs

1. 65/10 dispersion or downspout infiltration
2. Bioretention
3. Downspout dispersion systems
4. Perforated stub-out connections

##### Category C: Other hard surfaces

1. 65/10 dispersion
2. Permeable pavement
3. Bioretention
4. Sheet flow dispersion or concentrated flow dispersion

Consider and Apply BMPs in each category in the order they are listed

\*More technical information about BMPs listed above provided in attached worksheet

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### Applicable Definitions

Selected from the 2016 City of Gig Harbor Stormwater and Site Development Manual. Some definitions have been condensed or modified from their original form.

<b>Best Management Practice (BMP)</b>	The schedules of activities, prohibitions of practices, maintenance procedures, and structural and/or managerial practices, that when used singly or in combination, prevent or reduce the release of pollutants and other adverse impacts to waters of Washington.
<b>Comprehensive Planning</b>	Planning that takes into account all aspects of water, air, and land resources and their uses and limits.
<b>Compaction</b>	The densification, settlement, or packing of soil in such a way that permeability of the soil is reduced. Compaction effectively shifts the performance of a hydrologic group to a lower permeability hydrologic group.
<b>Compost</b>	Organic material that has undergone biological degradation and transformation under controlled conditions designed to promote aerobic decomposition at a solid waste facility in compliance with the requirements of Chapter 173-350 WAC, or biosolids composted in compliance with Chapter 173-308 WAC. Composting is a form of organic material recycling. Natural decay of organic solid waste under uncontrolled conditions does not result in composted material. (Note: Various BMPs have restrictions on the percentage of biosolids in compost, or do not allow biosolids in compost.)
<b>Construction Stormwater Pollution Prevention Plan (SWPPP)</b>	A document that describes the potential for pollution problems on a construction project, and explains and illustrates the measures to be taken on the construction site to control those problems.
<b>Critical Areas</b>	As defined by Chapter 18.08 Critical Areas GHMC.
<b>Detention Facility</b>	An above or below ground facility, such as a pond or tank, that temporarily stores stormwater runoff and subsequently releases it at a slower rate than it is collected by the drainage facility system. There is little or no infiltration of stored stormwater.
<b>Dispersion</b>	The release of surface and stormwater runoff such that the flow spreads over a wide area and is located so as not to allow flow to concentrate anywhere upstream of a drainage channel with erodible underlying granular soils.
<b>Erosion and sedimentation control</b>	Any temporary or permanent measures taken to reduce erosion; control siltation and sedimentation; and ensure that sediment-laden water does not leave the site.
<b>Filter fabric (silt fence)</b>	A woven or non-woven, water-permeable material generally made of synthetic products such as polypropylene and used in stormwater management and erosion and sedimentation control applications to trap sediment or prevent the clogging of aggregates by fine soil particles. See the WSDOT standard specifications and amendments, specifically, Section 9-33 Construction Geotextiles.
<b>Filter fabric fence</b>	A temporary sediment barrier consisting of a filter fabric stretched across and attached to supporting posts, and entrenched. The filter fence is constructed of stakes and synthetic filter fabric with a rigid wire fence backing where necessary for support. Also commonly referred to in the Washington Department of Transportation standard specifications as "construction geotextile for temporary silt fences."
<b>Flow Control BMP (or facility)</b>	A drainage facility designed to mitigate the impacts of increased surface and stormwater runoff flow rates generated by development. Flow control facilities are either designed to hold water for a considerable length of time and then release it by evaporation, plant transpiration, and/or infiltration into the ground, or designed to hold runoff for a short period, releasing it to the conveyance system at a controlled rate.
<b>Hard Surface</b>	An impervious surface, a permeable pavement, or a vegetated roof.
<b>Hydraulic Conductivity coefficient</b>	The quality of saturated soil that enables water or air to move through it. Also known as permeability coefficient.
<b>Hydrologic Soil Groups (USDA Soil Types)</b>	A soil characteristic classification system defined by the SCS in which a soil may be categorized into one of four soil groups (A, B, C, or D) based upon infiltration rate and other properties. <u>Type A:</u> Low runoff potential. Soils having high infiltration rates, even when thoroughly wetted, and consisting chiefly of deep, well drained to excessively drained sands or gravels. These soils have a high rate of water transmission <u>Type B:</u> Moderately low runoff potential. Soils having moderate infiltration rates when thoroughly wetted and consisting chiefly of moderately fine to moderately coarse textures. These soils have a moderate rate of water transmission. <u>Type C:</u> Moderately high runoff potential. Soils having slow infiltration rates when thoroughly wetted and consisting chiefly of soils with a layer that impedes downward movement of water, or soils with moderately fine to fine textures. These soils have a slow rate of water transmission. <u>Type D:</u> High runoff potential. Soils having very slow infiltration rates when thoroughly wetted and consisting chiefly of clay soils with a high swelling potential, soils with a permanent high-water table, soils with a hardpan, till, or clay layer at or near the surface, soils with a compacted subgrade at or near the surface, and shallow soils or nearly impervious material. These soils have a very slow rate of water transmission (Novotny and Olem 1994).
<b>Impervious surface</b>	A non-vegetated surface area that either prevents or retards the entry of water into the soil mantle as under natural conditions prior to development. A non-vegetated surface area that causes water to run off the surface in greater quantities or at an increased rate of flow from the flow present under natural conditions prior to development. Common impervious surfaces include, but are not limited to, rooftops, walkways, patios, driveways, parking lots or storage areas, concrete or asphalt paving, gravel roads, packed earthen materials, and oiled, macadam or other surfaces that similarly impede the natural infiltration of stormwater. Open, uncovered retention/detention facilities shall not be considered as impervious surfaces for the purposes of determining whether the thresholds for application of minimum requirements are exceeded. Open, uncovered retention/detention facilities shall be considered impervious surfaces for purposes of runoff modeling.
<b>Infiltration facility (or system)</b>	A drainage facility designed to use the hydrologic process of surface and stormwater runoff soaking into the ground, commonly referred to as a percolation, to dispose of surface and stormwater runoff.





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<b>Infiltration rate</b>	The rate, usually expressed in inches/hour, at which water moves downward (percolates) through the soil profile. Short-term infiltration rates may be inferred from soil analysis or texture or derived from field measurements. Long-term infiltration rates are affected by variability in soils and subsurface conditions at the site, the effectiveness of pretreatment or influent control, and the degree of long-term maintenance of the infiltration facility.
<b>Land disturbing activity</b>	Any activity that results in a change in the existing soil cover (both vegetative and nonvegetative) and/or the existing soil topography. Land disturbing activities include, but are not limited to clearing, grading, filling, and excavation. Compaction that is associated with stabilization of structures and road construction shall also be considered a land-disturbing activity. Vegetation maintenance practices, including landscape maintenance and gardening, are not considered land-disturbing activity. Stormwater facility maintenance is not considered land disturbing activity if conducted according to established standards and procedures
<b>Low Impact Development (LID)</b>	A stormwater and land use management strategy that strives to mimic pre-disturbance hydrologic processes of infiltration, filtration, storage, evaporation and transpiration by emphasizing conservation, use of onsite natural features, site planning, and distributed stormwater management practices that are integrated into a project design.
<b>Native vegetation</b>	Vegetation comprised of plant species, other than noxious weeds, that are indigenous to the coastal region of the Pacific Northwest and which reasonably could have been expected to naturally occur on the site.
<b>Outwash soils</b>	Soils formed from highly permeable sands and gravels.
<b>Permeable Pavement</b>	Pervious concrete, porous asphalt, permeable pavers or other forms of pervious or porous paving material intended to allow passage of water through the pavement section. It often includes an aggregate base that provides structural support and acts as a stormwater reservoir.
<b>Permeable soils</b>	Soil materials with a sufficiently rapid infiltration rate so as to greatly reduce or eliminate surface and stormwater runoff. These soils are generally classified as SCS hydrologic soil types A and B.
<b>Pervious Surface</b>	A surface material that allows stormwater to infiltrate into the ground. Examples include lawn, landscape, pasture, native vegetation areas, and permeable pavements.
<b>Project site</b>	That portion of a property, properties, or right of way subject to land disturbing activities, new hard surfaces, or replaced hard surfaces.
<b>Replaced hard surface</b>	For structures, the removal and replacement of hard surfaces down to the foundation. For other hard surfaces, the removal down to bare soil or base course and replacement.
<b>Sheet flow</b>	Runoff that flows over the ground surface as a thin, even layer, not concentrated in a channel.
<b>Stormwater</b>	That portion of precipitation that does not naturally percolate into the ground or evaporate, but flows via overland flow, interflow, pipes and other features of a stormwater drainage system into a defined surface waterbody, or a constructed infiltration facility.
<b>Stormwater facility</b>	A constructed component of a stormwater drainage system designed or constructed to perform a particular function, or multiple functions. Stormwater facilities include, but are not limited to, pipes, swales, ditches, culverts, street gutters, detention ponds, retention ponds, constructed wetlands, infiltration devices, catch basins, oil/water separators, bioretention, permeable pavement, and biofiltration swales.
<b>Tightline</b>	A continuous length of pipe that conveys water from one point to another (typically down a steep slope) with no inlets or collection points in between.
<b>Topsoil</b>	The upper portion of a soil, usually dark colored and rich in organic material.