



# PROJECT MINIMUM REQUIREMENTS

City of Seattle | Stormwater Manual



# Table of Contents

Acknowledgements ..... iv

CHAPTER 1 - Introduction ..... 1-1

    1.1. Purpose of This Manual (Volumes 1 through 5 and Appendices) ..... 1-1

    1.2. How to Use this Manual (Volumes 1 through 5 and Appendices)..... 1-3

    1.3. Purpose of Volume 1 ..... 1-4

    1.4. How to Use This Volume ..... 1-4

CHAPTER 2 - Determining Minimum Requirements..... 2-1

    2.1. Step 1 - Define the Boundaries of the Project Site ..... 2-1

    2.2. Step 2 - Identify the Type of Project ..... 2-3

    2.3. Step 3 - Identify the Receiving Water and Downstream Conveyance ....2-13

    2.4. Step 4 - Perform Site Assessment and Planning .....2-22

    2.5. Step 5 - Calculate Land-disturbing Activity and New Plus Replaced  
Hard Surface .....2-30

    2.6. Step 6 - Calculate New Plus Replaced Pollution-generating Surface ....2-39

    2.7. Step 7 - Determine Which Minimum Requirements Apply .....2-39

    2.8. Step 8 - Determine Drainage Control Review and Submittal  
Requirements .....2-41

CHAPTER 3 - Minimum Requirements for All Projects ..... 3-1

    3.1. Maintaining Natural Drainage Patterns ..... 3-1

    3.2. Discharge Point ..... 3-1

    3.3. Flood-prone Areas..... 3-2

    3.4. Construction Site Stormwater Pollution Prevention Control ..... 3-3

    3.5. Protect Wetlands ..... 3-4

    3.6. Protect Streams and Creeks ..... 3-6

    3.7. Protect Shorelines..... 3-6

    3.8. Ensure Sufficient Capacity ..... 3-6

    3.9. Install Source Control BMPs..... 3-7

    3.10. Do Not Obstruct Watercourses ..... 3-7

    3.11. Comply with Side Sewer Code..... 3-7

    3.12. Extension of Public Drainage System..... 3-8

    3.13. Public Drainage System Requirements ..... 3-9

    3.14. Maintenance and Inspection .....3-10

CHAPTER 4 - Minimum Requirements Based on Project Type ..... 4-1

    4.1. Parcel-based Projects ..... 4-2

    4.2. Trail and Sidewalk Projects.....4-12

    4.3. Roadway Projects .....4-13

CHAPTER 5 - Minimum Requirement Standards..... 5-1

    5.1. Soil Amendment ..... 5-1

    5.2. On-site Stormwater Management..... 5-1

    5.3. Flow Control ..... 5-8

    5.4. Water Quality Treatment .....5-14

CHAPTER 6 - Alternative Compliance ..... 6-1

CHAPTER 7 - Exemptions, Adjustments, and Exceptions..... 7-1

    7.1. Exemptions ..... 7-1

    7.2. Adjustments ..... 7-1

    7.3. Exceptions ..... 7-2

## Figures

Figure 2.1	Parcel-based Project Site Definition.....	2-6
Figure 2.2.	Sidewalk-only Project Site Definition. ....	2-7
Figure 2.3.	Trail Project Definition. ....	2-8
Figure 2.4.	Roadway Project Site Definition.....	2-9
Figure 2.5.	North End Creek and Small Lake Basins. ....	2-16
Figure 2.6.	South End Creek Basins. ....	2-17
Figure 2.7.	Public Combined Sewer Basins.....	2-18
Figure 2.8.	North End Designated Receiving Water Drainage Areas. ....	2-19
Figure 2.9.	South End Designated Receiving Water Drainage Areas. ....	2-20
Figure 2.10.	Capacity-constrained Systems. ....	2-21
Figure 2.11.	Example of Existing Hard Surface to Remain with Existing Floor Joists to Remain.....	2-34
Figure 2.12.	Example of Replaced Hard Surface with Floor Joists Removed or Replaced. ...	2-35
Figure 2.13.	Example of Replaced Hard Surface with Structure Removed Down to Slab on Grade/ Footings. ....	2-36
Figure 2.14.	Example of Existing Hard Surface to Remain with Existing 1st Floor Walls Remaining. ....	2-37
Figure 2.15.	Example with New, Replaced, and Existing Hard Surfaces. ....	2-38
Figure 4.1A.	Project Minimum Requirements for Parcel-based Projects. ....	4-3
Figure 4.1B.	Project Minimum Requirements for Parcel-based Projects (continued). ....	4-4
Figure 4.1C.	Project Minimum Requirements for Parcel-based Projects (continued). ....	4-5
Figure 4.2A.	Project Minimum Requirements for Roadway Projects. ....	4-15
Figure 4.2B.	Project Minimum Requirements for Roadway Projects (continued). ....	4-16
Figure 4.2C.	Project Minimum Requirements for Roadway Projects (continued). ....	4-17

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## CHAPTER 1 – Introduction

### 1.1. Purpose of This Manual (Volumes 1 through 5 and Appendices)

In addition to meeting the specific stormwater needs of the City of Seattle (City), the Stormwater Code meets certain requirements that apply to the City from the 2024-2029 Phase I National Pollutant Discharge Elimination System (NPDES) and State Waste Discharge General Permit for Discharges from Large and Medium Municipal Separate Storm Sewer Systems, effective August 1, 2024 (referred to as the Phase I NPDES Municipal Stormwater Permit). Coverage under the general permit is issued to the City by the Washington State Department of Ecology (Ecology) pursuant to the federal Clean Water Act and state law. One of the conditions of this permit requires the City to adopt and make effective a local program to prevent and control the impacts of stormwater runoff from new development, redevelopment, and construction activities. This is accomplished, in large measure, through the Seattle Stormwater Code and its associated Directors' Rule (this Manual), which Ecology has determined meets the requirements contained in the Phase I NPDES Municipal Stormwater Permit, with reference to the *Stormwater Management Manual for Western Washington* (SWMMWW) (Ecology 2024).

Excerpts from the Stormwater Code (in *italics*) are presented throughout the manual as a reference. In cases where there is conflict between the Stormwater Manual and the Stormwater Code, the Stormwater Code governs. The City's Stormwater Code is contained in the Seattle Municipal Code (SMC), Chapters 22.800 through 22.808. The Stormwater Code contains regulatory requirements that provide for and promote the health, safety, and welfare of the general public.

### Stormwater Code Language

SMC, Section 22.800.020 — *Purpose*

- A. *The provisions of this subtitle shall be liberally construed to accomplish its remedial purposes, which are:*
1. *To protect, to the greatest extent practicable, life, property and the environment from loss, injury and damage by pollution, erosion, flooding, landslides, strong ground motion, soil liquefaction, accelerated soil creep, settlement and subsidence, and other potential hazards, whether from natural causes or from human activity;*
  2. *To protect the public interest in drainage and related functions of drainage basins, watercourses and shoreline areas;*
  3. *To protect receiving waters from pollution, mechanical damage, excessive flows and other conditions in their drainage basins which will increase the rate of downcutting, streambank erosion, and/or the degree of turbidity, siltation and other forms of pollution, or which will reduce their low flows or low levels to levels which degrade the environment, reduce recharging of groundwater, or endanger aquatic and benthic life within these receiving waters and receiving waters of the state;*
  4. *To meet the requirements of state and federal law and the City's municipal stormwater National Pollutant Discharge Elimination System (NPDES) permit;*
  5. *To protect the functions and values of environmentally critical areas as required under the state's Growth Management Act and Shoreline Management Act;*
  6. *To protect the public drainage system from loss, injury and damage by pollution, erosion, flooding, landslides, strong ground motion, soil liquefaction, accelerated soil creep, settlement and subsidence, and other potential hazards, whether from natural causes or from human activity; and*
  7. *To fulfill the responsibilities of the City as trustee of the environment for future generations.*
- B. *It is expressly the purpose of this subtitle to provide for and promote the health, safety and welfare of the general public. This subtitle is not intended to create or otherwise establish or designate any particular class or group of persons who will or should be especially protected or benefited by its terms.*
- C. *It is expressly acknowledged that water quality degradation can result either directly from one discharge or through the collective impact of many small discharges. Therefore, the water quality protection measures in this subtitle are necessary to protect the health, safety and welfare of the residents of Seattle and the integrity of natural resources for the benefit of all and for the purposes of this subtitle. Such water quality protection measures are required under the federal Clean Water Act, 33 U.S.C. Section 1251, et seq., and in response to the obligations of the City's municipal stormwater discharge permit, issued by the State of Washington under the federal NPDES program.*

To support implementation of the Stormwater Code, the Director of Seattle Public Utilities (SPU) and the Director of the Seattle Department of Construction and Inspection (SDCI) adopt rules that provide specific technical requirements, criteria, guidelines, and additional information. This Directors' Rule consists of a five-volume City Stormwater Manual and ten appendices.

## 1.2. How to Use this Manual (Volumes 1 through 5 and Appendices)

The City’s Stormwater Manual includes the following five volumes:

- *Volume 1: Project Minimum Requirements* provides information about how to apply the minimum requirements contained in the Stormwater Code. It also provides site assessment and planning steps and requirements for drainage control review submittals.
- *Volume 2: Construction Stormwater Control* contains temporary erosion and sediment control technical requirements, which are required to minimize downstream impacts and to prevent contaminants from leaving the project site during construction.
- *Volume 3: Project Stormwater Control* presents approved methods, criteria, and details for analysis and design of on-site stormwater management, flow control, and water quality treatment best management practices (BMPs).
- *Volume 4: Source Control* provides information to individuals, businesses, and public agencies in Seattle to implement BMPs for controlling pollutants at their source and preventing contamination of stormwater runoff.
- *Volume 5: Enforcement* provides standards, guidelines, and requirements for enforcing the Stormwater Code.

The City’s Stormwater Manual includes the following ten appendices:

- *Appendix A: Definitions* provides terminology from the Stormwater Code for all five volumes of the Stormwater Manual and other definitions as adopted in the Manual.
- *Appendix B: Drainage Control Report and Additional Submittal Requirements* provides supplemental information for Volume 1 (Project Minimum Requirements) related to submittal requirements including required drainage control report elements.
- *Appendix C: On-site List Infeasibility Criteria* provides a list of criteria to be evaluated for on-site stormwater management.
- *Appendix D: Subsurface Investigation and Infiltration Testing for Infiltration BMPs* describes subsurface report requirements, geotechnical explorations, four infiltration testing methods (Simple Test, Small Pilot Infiltration Test (PIT), Large PIT, and Deep Infiltration Test), infiltration rate correction factors, groundwater monitoring, and groundwater mounding analysis.
- *Appendix E: Additional BMP Design Requirements* includes additional design requirements for flow control structures, flow splitters, flow spreaders, level spreaders, pipe slope drains, outlet protection, facility liners, and geotextiles.
- *Appendix F: Hydrologic Analysis and Design* includes descriptions of acceptable methods for estimating the quantity and hydrologic characteristics of stormwater runoff, and the assumptions and data requirements of these methods.
- *Appendix G: Stormwater Control Operations and Maintenance Requirements* contains maintenance requirements for typical stormwater BMPs and components.

- *Appendix H: Financial Feasibility Documentation for Vegetated Roofs and Rainwater Harvesting* provides additional guidance on the required documentation to prove financial infeasibility of vegetated roofs or rainwater harvesting.
- *Appendix I: Landscape Management Plans and Integrated Pest Management Plans* provides supplemental information for Volume 1 (Project Minimum Requirements) and Volume 4 (Source Control).
- *Appendix J: Plant and Tree Lists for Stormwater BMPs* provides a guide for appropriate plants and trees to be in bioretention (infiltrating and non-infiltrating), biofiltration swales, sand filters, and wet ponds.

### 1.3. Purpose of Volume 1

*Volume 1 – Project Minimum Requirements* describes minimum requirements for all types of land development and redevelopment. It also provides site assessment and planning steps and drainage control review requirements.

### 1.4. How to Use This Volume

- *Chapter 1* outlines the purpose and content of the entire Stormwater Manual.
- *Chapter 2* outlines steps to determine a project’s minimum requirements.
- *Chapter 3* describes the minimum requirements for all projects.
- *Chapter 4* describes the minimum requirements for specific project types.
- *Chapter 5* describes the minimum standards for on-site stormwater management, flow control, and water quality treatment.
- *Chapter 6* describes the options for alternative compliance.
- *Chapter 7* describes exemptions, adjustments, and exceptions.

## CHAPTER 2 – Determining Minimum Requirements

There are eight basic steps used to determine which minimum requirements for on-site stormwater management, flow control, and water quality treatment apply to a project:

- **Step 1** – Define the boundaries of the project site.
- **Step 2** – Identify the type of project.
- **Step 3** – Identify the receiving water and downstream conveyance.
- **Step 4** – Perform site assessment and planning.
- **Step 5** – Calculate new plus replaced hard surface and native vegetation conversion.
- **Step 6** – Calculate new plus replaced pollution generating surface.
- **Step 7** – Determine which minimum requirements apply.
- **Step 8** – Determine drainage control review and application requirements.

Details of each of the eight steps are provided in the following subsections.

In addition to determining the applicable minimum requirements, all projects must comply with all other Stormwater Code requirements, in particular the Minimum Requirements for All Discharges and All Real Property (SMC, Chapter 22.803) and the Minimum Requirements for All Projects (SMC, Chapter 22.805).

### 2.1. Step 1 – Define the Boundaries of the Project Site

The boundaries of the project site must include all development activities as defined by “development” SMC, Section 22.801.050. The boundary of the public right-of-way typically forms the boundary between project types if more than one project type exists.

The project site may also include contiguous areas that are subject to the addition or replacement of hard surface or the undertaking of land-disturbing activity.

In the case of a subdivision, short plat, or closely related projects, including common plan of development or sale, the boundary of the project site is the full area included in the subdivision, short plat, or closely related projects. See SMC, Section 22.805.010 and *Appendix B* for specific requirements for subdivisions and short plats.

All projects, even if implemented in incremental stages or phases, must consider the total combined development at full build-out when determining Stormwater Code requirements.

<b>Stormwater Code Language</b>
<p>SMC, Subsection 22.808.010.A.1—<i>Civil violations</i></p> <p><i>g. Piecemeal of projects. It is a violation for any person to knowingly divide a larger project into a set of smaller projects specifically for the purpose of avoiding minimum requirements;</i></p>

### 2.1.1. *Definitions Related to the Project Site*

For definitions related to the project site such as “development”, “hard surface”, “project”, “project site” or “site”, refer to SMC, Chapter 22.801 and *Appendix A*.

Defining project boundaries will help identify the project type(s) in Step 2.

### 2.1.2. *Closely Related Projects*

<b>Stormwater Code Language</b>
SMC, Subsection 22.805.010.B – <i>Closely related projects, projects under a common plan of development or sale, subdivisions, and short plats are considered as one project for purposes of applying the Stormwater Code, including but not limited to determining whether the thresholds for applicability of particular Stormwater Code minimum requirements are met.</i>
SMC, Subsection 22.801.040.C – <p><i>“Closely related projects” means two or more projects that are concurrently under review, under issued permits not yet approved for final construction, or both, and share any of the following physical or functional interdependencies:</i></p> <ol style="list-style-type: none"> <li>1. <i>A feature physically spans the property lines between lots or the project sites, such as shared structures, shared driveways, shared pedestrian access (including easements to rights-of-way), shared drainage and utility designs, foundation footings, or retaining walls. For purposes of this subsection, abutting driveways or pedestrian accesses are not considered to span the property lines if the required driveway or pedestrian access width for each project independently meets development standards;</i></li> <li>2. <i>A shared driveway is proposed to access a parking area for more than one project, regardless of whether the parking is required;</i></li> <li>3. <i>Parking, including maneuvering, aisle requirements, or other parking related easements, regardless of whether the parking is required, is proposed to be provided (or partially provided) on the site of another project, even if the project sites do not abut each other;</i></li> <li>4. <i>Proposed structures are joined or share a common wall;</i></li> <li>5. <i>Proposed projects share required open space, amenity area, or both;</i></li> <li>6. <i>The design of two or more project sites are dependent on grading, construction of retaining walls or foundations, or both across the lot lines or project sites;</i></li> <li>7. <i>One site is required to permanently access, construct, and maintain the structures or development features on an abutting or adjacent site; or</i></li> <li>8. <i>Other features that create physical or functional interdependence between the projects.</i></li> </ol>

Projects submitted for review are considered “under review” once a complete project application has been made, until the applicable construction permits for the project are issued, or the permit application is withdrawn by the applicant. Final construction approval means that all final inspections are conducted and passed, all fees are paid, and the permit status is “completed.”

### 2.1.3. Common Plan of Development or Sale

<b>Stormwater Code Language</b>
<p>SMC, Subsection 22.801.040.C – “Common plan of development or sale” means a site where multiple separate and distinct construction activities may be taking place at different times on different schedules and/or by different contractors, but still under a single plan. Examples of “common plan of development or sale” include:</p> <ol style="list-style-type: none"> <li>1. Phased projects and projects with multiple filings/lots, even if the separate phases or filings/lots will be constructed under separate contract or by separate owners (e.g., a development where lots are sold to separate builders);</li> <li>2. A development plan that may be phased over multiple years, but is still under a consistent plan for long-term development;</li> <li>3. Projects in a contiguous area that may be unrelated but still under the same contract, such as construction of a building extension and a new parking lot at the same facility; and</li> <li>4. Linear projects such as roads, pipelines, or utilities.</li> </ol>

A single plan means coordinated development across one or more adjacent or abutting project sites that are planned, designed, permitted, or implemented as parts of a unified development project or phased buildout whether constructed concurrently or in phases or under separate permits.

For purposes of this section, development activities that are separate in time, ownership, permitting, or construction may nevertheless be considered part of a single plan when there is objective evidence that the activities are related or integrated, including but not limited to:

1. Shared or related planning documents;
2. Coordinated or sequential phasing intended to implement an overall development concept;
3. Common ownership or control together with coordinated timing, design, permitting, financing, marketing, or construction; or
4. Other evidence demonstrating that the activities function as components of a unified development project.

In determining whether development remains under a single plan, the Director may consider the totality of the circumstances. The Director may determine that separate actions fall within a single plan where the division of land, sequencing of permits, modification of project boundaries, or changes in ownership have the purpose or effect of avoiding applicable stormwater thresholds, minimum requirements, or review obligations.

## 2.2. Step 2 – Identify the Type of Project

For the purpose of determining applicable minimum requirements, there are nine general classifications of projects:

1. Parcel-based (*Section 2.2.1*)
2. Sidewalk (*Section 2.2.2*)

3. Trail (*Section 2.2.3*)
4. Roadway (*Section 2.2.4*)
5. Utility (*Section 2.2.5*)
6. Pavement maintenance (*Section 2.2.6*)
7. Remediation (*Section 2.2.7*)
8. Retrofit (*Section 2.2.8*)
9. Washington State Department of Transportation (WSDOT) (*Section 2.2.9*)

Each project type is described in the following subsections (*Section 2.2.1* through *2.2.9*).

In addition to the general classifications listed above, some projects are more complex than others (e.g., bridges, closed depressions, rail yards, rail stations, light rail guideways and tracks (both elevated and non-elevated), and other rail lines and railways) or include more than one project type, making it difficult to determine the applicable minimum requirements. Refer to *Section 2.7.1. Special Circumstances* for additional guidance on determining applicable minimum requirements.

### 2.2.1. Parcel-based Project

A parcel-based project (Figure 2.1) is defined in SMC, Section 22.801.170.

<b>Stormwater Code Language</b>
SMC, Section 22.801.170 - <i>"Parcel-based project" means any project that is not a roadway project, sidewalk project, or trail project. The boundary of the public right-of-way shall form the boundary between the parcel and roadway portions of a project.</i>

Examples of parcel-based projects include, but are not limited to, commercial developments, multifamily developments, apartments, carriage houses, cottage housing development, rowhouse developments, townhouse development, institutions, industrial buildings and sites, parking lots, parks and playgrounds, commercial use development, public facilities, live-work units, manufacturing facilities, storage facilities, transportation facilities, utility use facilities, subdivisions, short plats, building additions, and single-family and all other residential developments. Utility work on the parcel that is integral with and contiguous to the project area is part of the parcel-based project.

In addition, the following specific pollution-generating activities or projects are considered parcel-based projects and require drainage review. Specifically, source control BMPs must be implemented as specified in *Volume 4*, to the extent necessary to prevent prohibited discharges and to prevent contaminants from coming in contact with drainage water or being discharged to the drainage system, public combined sewer, or directly into receiving waters.

<b>Stormwater Code Language</b>
SMC, Section 22.807.020.A.2.j — <i>Applications for approvals for activities or projects for:</i>
<ol style="list-style-type: none"> <li>1. <i>Fueling at dedicated stations, for new or substantially altered fueling stations.</i></li> <li>2. <i>In-water and over-water fueling.</i></li> <li>3. <i>Maintenance and repair of vehicles and equipment.</i></li> <li>4. <i>Concrete and asphalt mixing and production.</i></li> <li>5. <i>Recycling, wrecking yard, and scrap yard operations.</i></li> <li>6. <i>Storage of liquids in aboveground tanks.</i></li> <li>7. <i>Other projects that the Director determines pose a hazard to public health, safety, or welfare; endanger any property; adversely affect the safety and operation of City right-of-way, utilities, or other property owned or maintained by the City; or adversely affect the functions and values of an environmentally critical area or buffer.</i></li> </ol>

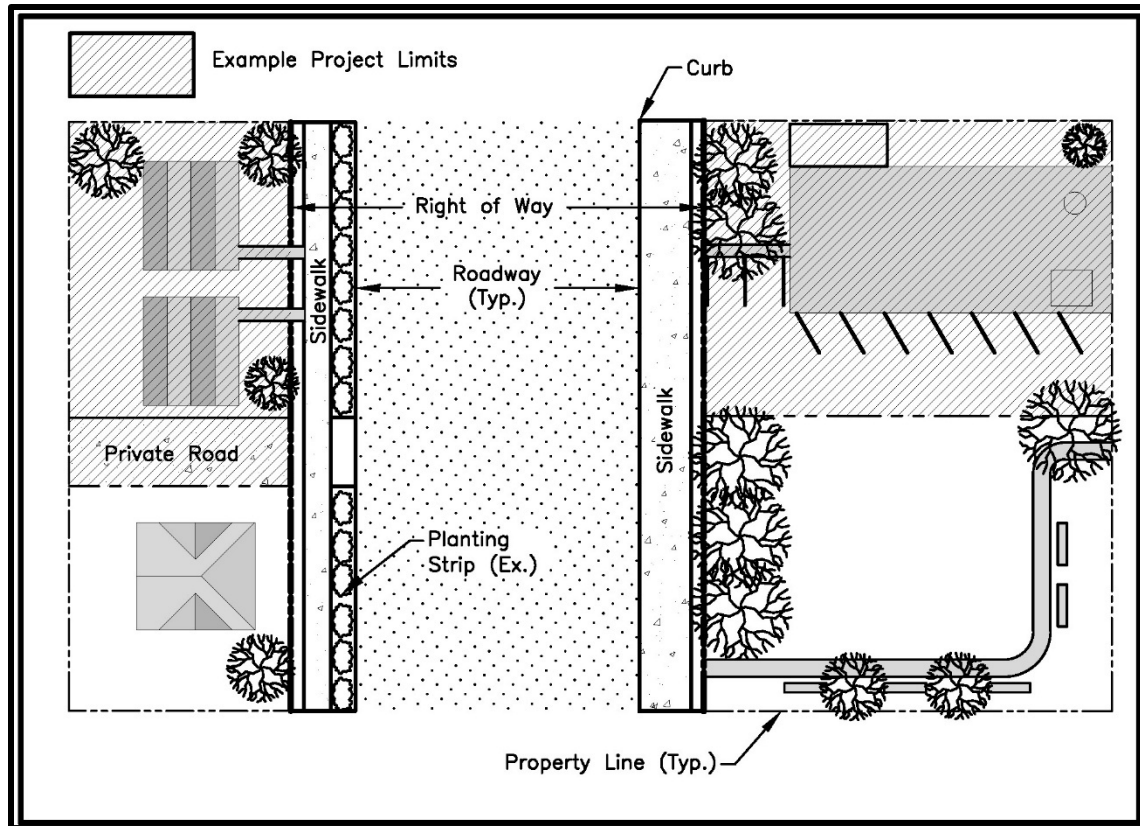


Figure 2.1 Parcel-based Project Site Definition.

### 2.2.2. Sidewalk Project

A sidewalk project (Figure 2.2) is defined in SMC, Section 22.801.200.

<b>Stormwater Code Language</b>
SMC, Section 22.801.200 - <i>"Sidewalk project" means a project for the creation of a new sidewalk or replacement of an existing sidewalk, including any associated planting strip, apron, curb ramp, curb, or gutter, and necessary roadway grading and repair. If the total new plus replaced hard surface in the roadway exceeds 10,000 square feet, the entire project is a roadway project.</i>

Projects that meet the definition of a roadway project (SMC 22.801.190) are not considered sidewalk projects and must meet the requirements of *Section 2.2.4 Roadway Project* regardless of the amount of new or replaced hard surface in the roadway or alley.

Projects whose sole purpose is to upgrade existing hard surfaces for ADA compliance are considered a sidewalk project or trail project if not otherwise exempt. Note that this designation does not extend to additional work, such as extending or altering a sidewalk, stairwell, or parking spaces beyond what is necessary to meet ADA compliance of an existing hard surface.

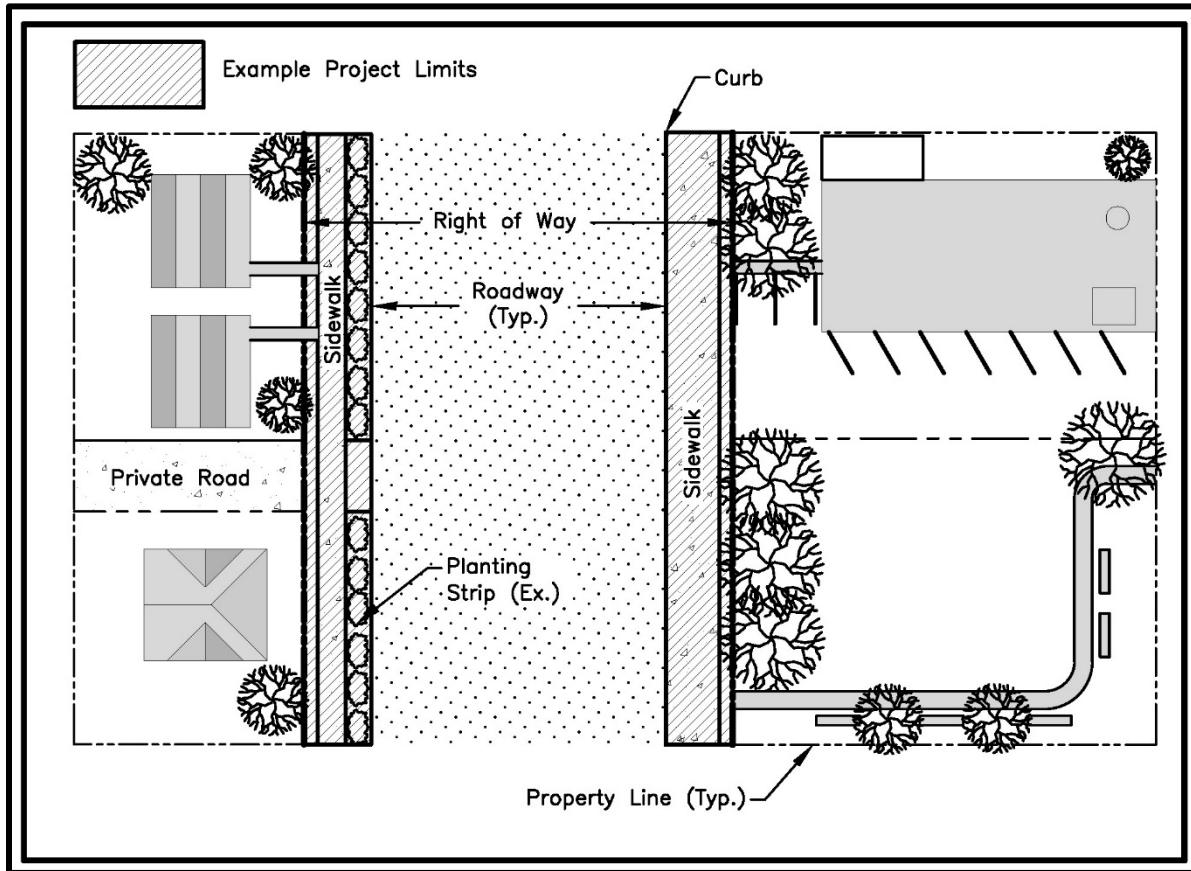


Figure 2.2. Sidewalk-only Project Site Definition.

### 2.2.3. Trail Project

A trail project (Figure 2.3) is defined in SMC, Section 22.801.210.

#### Stormwater Code Language

SMC, Section 22.801.210 - "Trail project" means a project for the creation of a new trail or replacement of an existing trail, and which does not contain pollution-generating hard surfaces.

The following trail portions of a project site may follow the requirements of *Volume 1, Section 4.2 Trail and Sidewalk Projects* if the trail portion:

1. Is not integral to the portions of the parcel-based project (i.e., the trail can function without the parcel-based project improvements), and
2. Does not have a surface discharge from a natural or constructed conveyance system from the site.

Those trails, paths, or sidewalks that are integral with and contiguous to a parcel-based project or roadway project must meet the requirements of *Volume 1, Section 4.1 Parcel-based Projects* or *Volume 1, Section 4.3. Roadway Projects*, respectively.

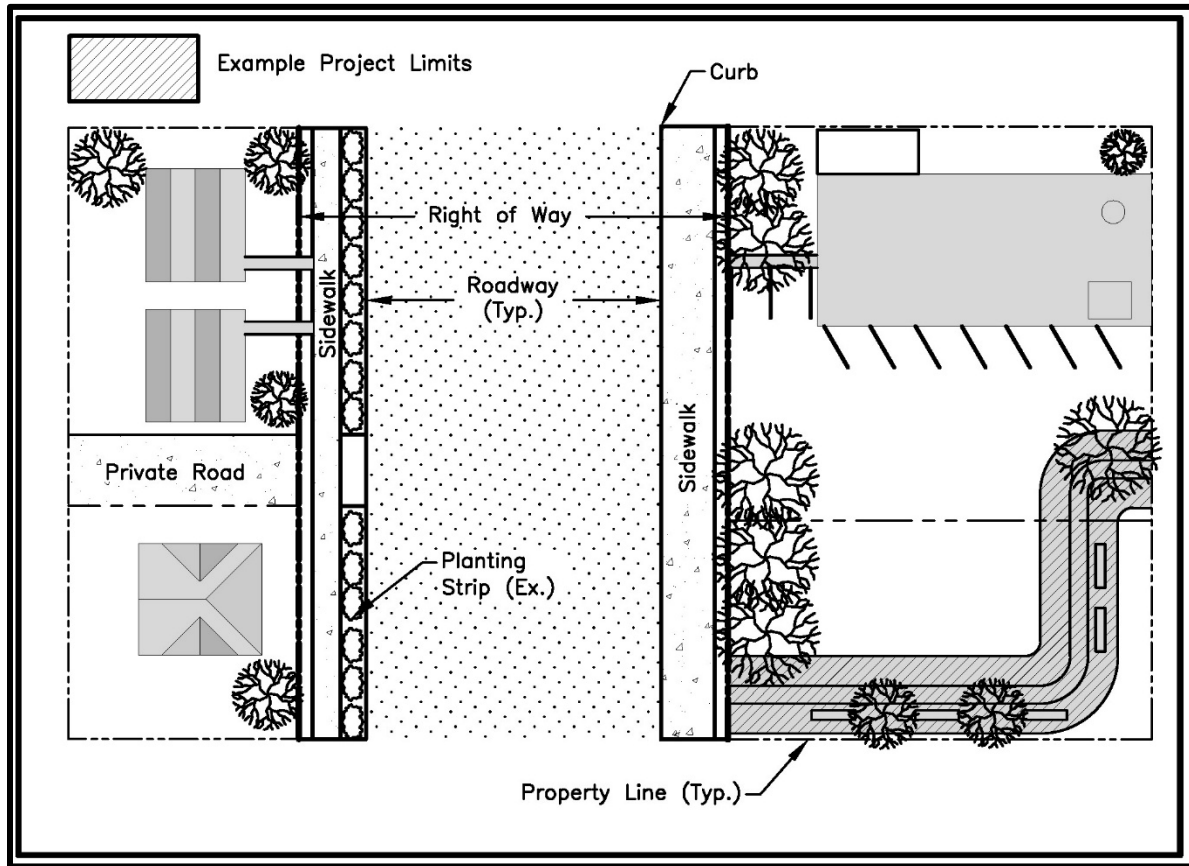


Figure 2.3. Trail Project Definition.

### 2.2.4. Roadway Project

A roadway project (Figure 2.4) is defined in SMC, Section 22.801.190.

<b>Stormwater Code Language</b>
SMC, Section 22.801.190 - "Roadway project" means a project located in the public right-of-way that involves the creation of a new or replacement of an existing roadway or alley. The boundary of the public right-of-way shall form the boundary between the parcel and roadway portions of a project

Typically, the boundary of the public right-of-way forms the boundary between the parcel and roadway portions of a project, but special circumstances may exist (refer to Section 2.7.1).

Projects that do not meet the definition of a roadway project (i.e., projects that include any development in addition to the creation of a new or replacement of an existing roadway or alley), are parcel-based projects. As an example, portions of projects that include building development and associated hard surfaces (e.g., parking lot) located in the public right-of-way are considered parcel-based projects (refer to Section 4.1 for requirements).

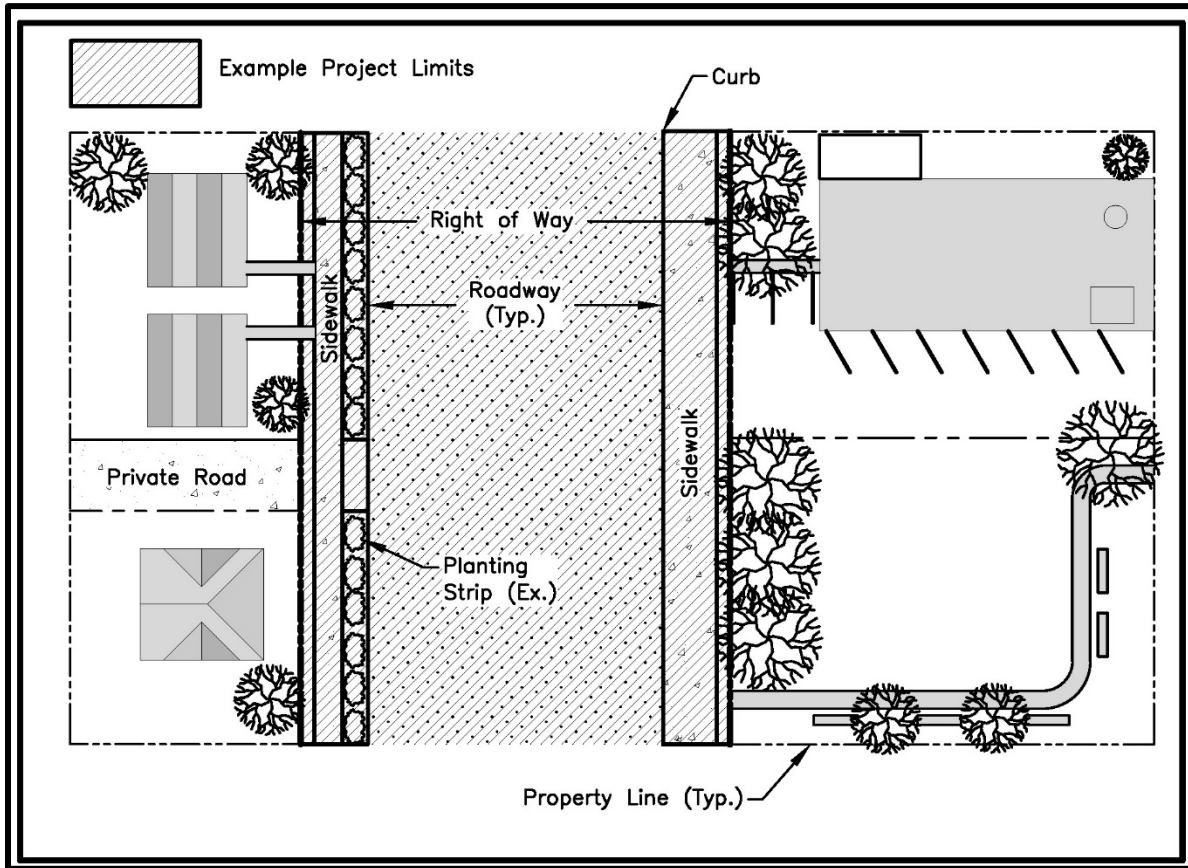


Figure 2.4. Roadway Project Site Definition.

### 2.2.5. *Utility Project*

Applicable utility projects are described in SMC, Subsection 22.800.040.A.2.a. Note that the installation of side sewers, service drains, and underdrains require a Side Sewer Permit per SMC, Section 21.16.070 (Permit and Fee Required for Connection and Repairs).

Installation of a new fuel tank is not considered a utility project. Projects that include fuel dispensing equipment, installation of underdrains for groundwater collection, parking or driveway areas for utility maintenance or operation, buildings for utility maintenance or operation, or pavement replacement or repair beyond the extent required for the utility maintenance, repair, or installation are not considered a utility project.

<b>Stormwater Code Language</b>
<p>SMC 22.800.040.A.2.a — <i>Maintenance, repair, upgrade, or installation of underground or overhead utility facilities, such as, but not limited to, pipes, conduits, and vaults, that replaces the ground surface with in-kind material or materials with similar runoff characteristics is exempt from Section 22.805.070 (Minimum requirements for on-site stormwater management), Section 22.805.080 (Minimum requirements for flow control), and Section 22.805.090 (Minimum requirements for treatment), except installation of underground or overhead utility facilities that are integral with and contiguous to a trail or sidewalk project, parcel-based project, or a road-related project must comply with Section 22.805.040 (Minimum requirements for trail and sidewalk projects), Section 22.805.050 (Minimum requirements for parcel-based projects), or Section 22.805.060 (Minimum requirements for roadway projects), respectively.</i></p>

Note that utility projects are not exempt from other Stormwater Code requirements, including SMC, Section 22.805.020 (Minimum Requirements for All Projects).

The limits of a utility project include only the area disturbed that is necessary for the utility work (including any over-excavation necessary) and required ADA updates per the federal Americans with Disabilities Act.

### 2.2.6. *Pavement Maintenance Project*

Applicable pavement maintenance projects are described in SMC, Subsection 22.800.040.A.2.b and are limited to the pavement maintenance practices identified in SMC, Section 22.801.040.

<b>Stormwater Code Language</b>
<p>SMC, 22.800.040.A.2.b – <i>Pavement maintenance practices, as defined in Section 22.801.170, are exempt from Section 22.805.070 (Minimum requirements for on-site stormwater management), Section 22.805.080 (Minimum requirements for flow control), and Section 22.805.090 (Minimum requirements for treatment) except pavement maintenance practices that are integral with and contiguous to a parcel-based project or a road-related project must comply with Section 22.805.050 (Minimum requirements for parcel-based projects) or Section 22.805.060 (Minimum requirements for roadway projects), respectively.</i></p>
<p>SMC, 22.801.170 - <i>“Pavement maintenance practices” means repair and maintenance of an existing surface including sidewalks, limited to:</i></p> <ol style="list-style-type: none"> <li>1. <i>Targeted pothole and square cut patching;</i></li> <li>2. <i>Overlaying existing asphalt, concrete, or brick pavement with asphalt or concrete, so long as the base course is not exposed;</i></li> <li>3. <i>Shoulder grading;</i></li> <li>4. <i>Reshaping or regrading drainage systems, including adding curb, gutter, or wedge curbs;</i></li> <li>5. <i>Crack sealing; and</i></li> <li>6. <i>Vegetation maintenance.</i></li> </ol> <p><i>“Pavement maintenance practices” does not include work that: increases the vehicle capacity of a roadway or parking area; adds new hard surface or results in replaced hard surface (except for pothole or square cut patching); or materially alters a roadway’s characteristics.</i></p>

Note that pavement maintenance projects are not exempt from other Stormwater Code requirements, including SMC, Section 22.805.020 (Minimum Requirements for All Projects).

The limits of a pavement maintenance project include only the area disturbed that is necessary for the pavement maintenance work and required ADA updates per the federal Americans with Disabilities Act.

### **2.2.7. Remediation Project**

Applicable remediation projects are described in SMC, Subsection 22.800.040.A.2.c.

<b>Stormwater Code Language</b>
<p>SMC, SMC 22.800.040.A.2.c – <i>Land disturbing activity that includes replacing the ground surface with in-kind material or with materials having equivalent runoff characteristics and is associated solely with soil remediation or tank removal for the purpose of removing contaminants and pollutants and not associated with other development is not required to comply with subsections 22.805.050.A and 22.805.060.A (Soil amendment), Section 22.805.070 (Minimum requirements for on-site stormwater management), or Section 22.805.080 (Minimum requirements for flow control). Projects that include any development in addition to soil remediation or tank removal are not exempt.</i></p>

Note that remediation projects are not exempt from other Stormwater Code requirements, including SMC, Section 22.805.020 (Minimum Requirements for All Projects).

### 2.2.8. *Retrofit Project*

Applicable retrofit projects are described in SMC, Subsection 22.800.040.A.2.d.

<b>Stormwater Code Language</b>
<p>SMC, 22.800.040.A.2.d – <i>Drainage control facilities that are part of a public retrofit project installed to meet Appendix 12 to the City's municipal stormwater NPDES permit or for combined sewer control, or other voluntary retrofit project, are not required to comply with Section 22.805.070 (Minimum requirements for on-site stormwater management), Section 22.805.080 (Minimum requirements for flow control), or Section 22.805.090 (Minimum requirements for treatment). This exemption does not include land disturbing activities or hard surfaces that are not integral with or are in addition to the drainage control facilities described above, or installation of drainage control facilities that are otherwise required to meet this subtitle.</i></p>

Note that retrofit projects are not exempt from other Stormwater Code requirements, including SMC, Section 22.805.020 (Minimum Requirements for All Projects).

Examples of projects that meet the criteria for retrofit projects include projects whose purpose is to reduce runoff, improve water quality, reduce flooding, reduce sanitary sewer overflows (SSOs), or combined sewer overflows (CSOs) and are not otherwise installed to meet the requirements of SMC, Chapter 22.805. Examples of retrofit projects include:

1. Installation of flow control facilities (e.g., detention tanks, pump stations).
2. Installation of water quality treatment facilities (e.g., water quality treatment pond).
3. Installation of green stormwater infrastructure (e.g., natural drainage systems, bioretention cells).
4. Retrofit of existing drainage and wastewater infrastructure.
5. Restoration of riparian buffer.
6. Restoration of forest cover.
7. Floodplain reconnection project.
8. Removal of impervious or hard surfaces not associated with other development.
9. Other actions to address stormwater runoff and water quality treatment.

As specified in SMC, Subsection 22.800.040.A.2.d, this exemption for retrofit projects does not include land disturbing activities or hard surfaces that are not integral to, are in addition to, or are otherwise required to meet the Stormwater Code. For example, community benefit amenities installed in addition to the retrofit drainage control facility (e.g., trails, playground areas) must meet the requirements (e.g., On-site Stormwater Management, Flow Control) of the applicable project type (e.g., Trail and Sidewalk Projects, Parcel-based Projects).

All retrofit projects must use on-site BMPs identified in Subsection 22.805.070.D or other infiltration BMPs per Volume 3 to the maximum extent feasible for those hard surfaces that do not drain to or are not otherwise managed by the retrofit project (e.g., drainage control facility maintenance access roads).

### 2.2.9. *WSDOT Project*

For the purposes of this Manual, a WSDOT project (that will manage stormwater as stated in SMC, Subsection 22.800.040.A.6) includes WSDOT roadway projects within state rights-of-way under WSDOT control and within the jurisdiction of the City.

In addition to the other provisions in Subsection 22.800.040.A.6, WSDOT projects must comply with Stormwater Code requirements when discharging to a public drainage system or combined sewer system as prescribed in Subsection 22.800.040.A.6.c.

Applicable WSDOT projects are described in SMC, Subsection 22.800.040.A.6.

<b>Stormwater Code Language</b>
<p>SMC, 22.800.040.A.6 – <i>With respect to all state highway right-of-way under Washington State Department of Transportation (WSDOT) control within the jurisdiction of The City of Seattle, WSDOT shall use the current, approved Highway Runoff Manual (HRM) for its existing and new facilities and rights-of-way, as addressed in WAC 173-270-030(1) and (2). Exceptions to this exemption, where more stringent stormwater management requirements apply, are addressed in WAC 173-270-030(3)(b) and (c).</i></p> <p>a. <i>When a state highway is located in the jurisdiction of a local government that is required by Ecology to use more stringent standards to protect the quality of receiving waters, WSDOT shall comply with the same standards to promote uniform stormwater management.</i></p> <p>b. <i>WSDOT shall comply with standards identified in watershed action plans for WSDOT rights-of-way, to the extent required by state law.</i></p> <p>c. <i>Other instances where more stringent local stormwater standards apply are projects subject to tribal government standards or to the stormwater management-related permit conditions imposed under Chapter 25.09 to protect environmentally critical areas and their buffers (under the Growth Management Act), an NPDES permit, or shoreline master programs (under the Shoreline Management Act). In addition, WSDOT shall comply with local jurisdiction stormwater standards when WSDOT elects, and is granted permission, to discharge stormwater runoff into a municipality's drainage system or combined sewer system.</i></p>
<b>References</b>
<ul style="list-style-type: none"> <li>• Volume 1, Section 4.3 (SMC, Section 22.805.060) – Minimum Requirements for Roadway Projects</li> <li>• WSDOT Highway Runoff Manual</li> <li>• WAC, Sections 173-270-030(1) and (2) – Best Management Practices – Approved Manual Required and Amendments to Manual</li> <li>• WAC, Sections 173-270-030(3)(b) and (c) – More Stringent Standards</li> <li>• SMC, Chapter 25.09 – Environmentally Critical Areas</li> </ul>

## 2.3. Step 3 – Identify the Receiving Water and Downstream Conveyance

For minimum requirement purposes, runoff leaving the project site is classified based on the type of system and receiving water into which the project site discharges. The project proponent must identify the receiving water or point of discharge for the stormwater runoff

from the project site (e.g., wetland, lake, creek, salt water, or combined sewer) for review and approval or disapproval by the Director. Refer to *Section 3.2* and *Section 3.12*.

The minimum requirements vary considerably by type of receiving water and downstream conveyance; therefore, it is very important to determine and specify the receiving water and type of downstream conveyance. Note: there may be multiple downstream receiving waters (e.g., a creek that flows into a small lake). In this case, the minimum requirements for all downstream receiving waters must apply.

Portions of watersheds near the City limits discharge to adjacent jurisdictions. In these cases, the more stringent requirements between the Seattle Stormwater Code and Manual and the receiving jurisdiction's requirements will be applied for determining stormwater mitigation requirements (e.g., discharges to nutrient-critical receiving waters). Refer to the Phase I and Phase II Municipal Stormwater Permits for enforceable documents that are functionally equivalent to Ecology's requirements.

Seattle has a complicated system due to historical annexations, major sewer and drainage projects, and other complexities. Therefore, prior to proceeding with project design, confirm your project discharge location through the City's Preliminary Application Report (PAR) process to determine your project requirements. For projects that are not required to go through the PAR process, contact the following review team(s) based on the project type, location, and information needed:

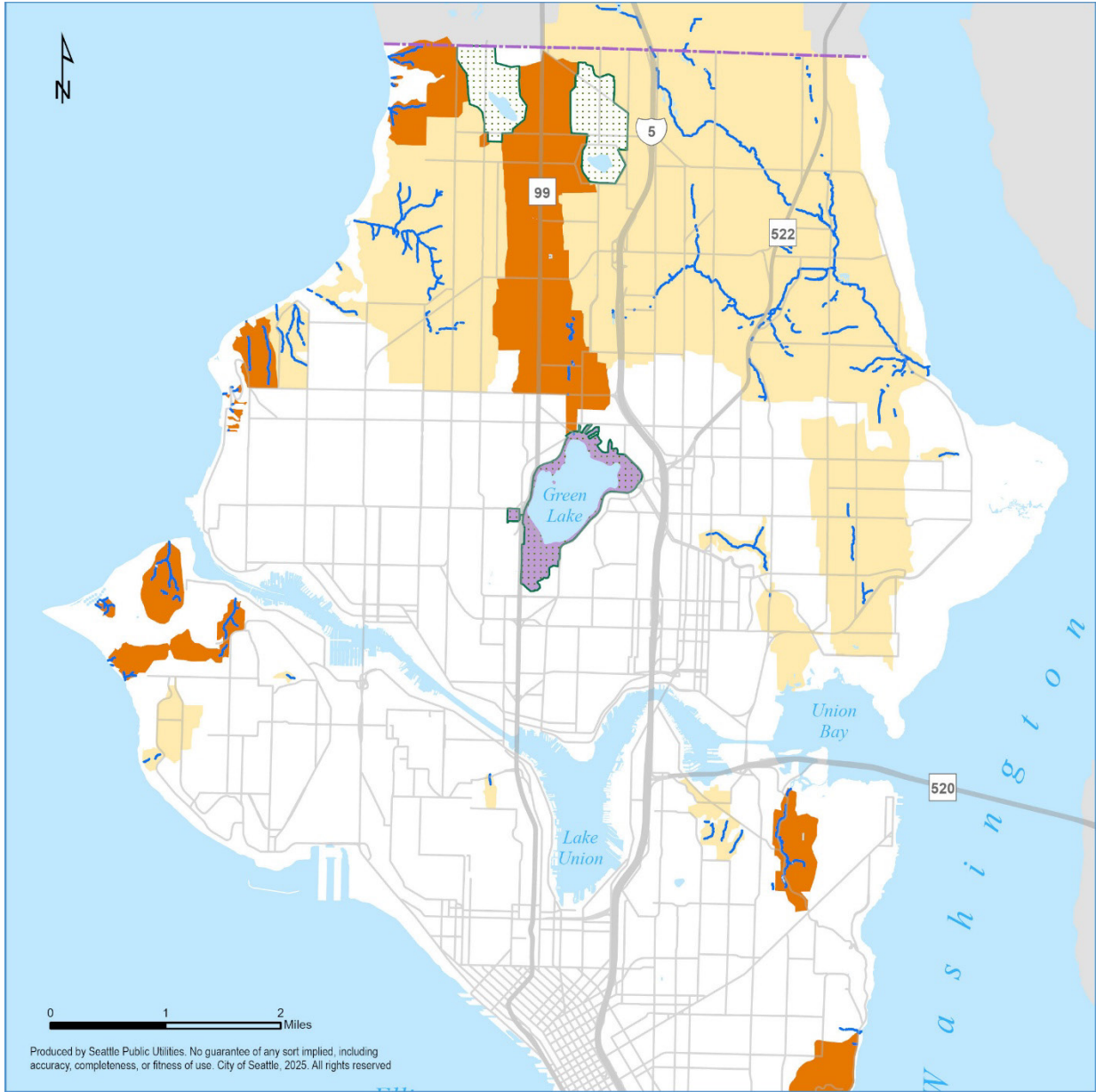
1. Projects conducted on private parcels:
  - a. Approved point of discharge: SPU Side Sewer Team at SideSewerInfo@seattle.gov
  - b. For Stormwater Code and Manual requirements: SDCI Drainage Review Team using the SDCI Contact Us-Send Us a Question website (<https://www.seattle.gov/sdci/about-us/contact-us>).
2. Developer-related projects conducted in the right-of-way:
  - a. SPU\_PlanReview@seattle.gov.
3. Capital improvement projects conducted in the right-of-way:
  - a. SPU\_CIP\_Review@seattle.gov for capital improvement projects conducted in the right-of-way.

The receiving waters and systems in Seattle include the following:

- **Wetlands:** Designated under SMC, Section 25.09.020. Discharges are to the wetland or the associated drainage basin.
- **Creek Basins:** Include stream basins throughout Seattle, generally referred to as "creek basins." Discharges are to the creek or the associated drainage basin whether or not a creek is formally typed (see Figures 2.5 and 2.6 for reference). Creeks in piped systems are considered creeks.
- **Public Combined Sewer:** Discharges are to the public combined sewer or its associated basin (see Figure 2.7 for reference).

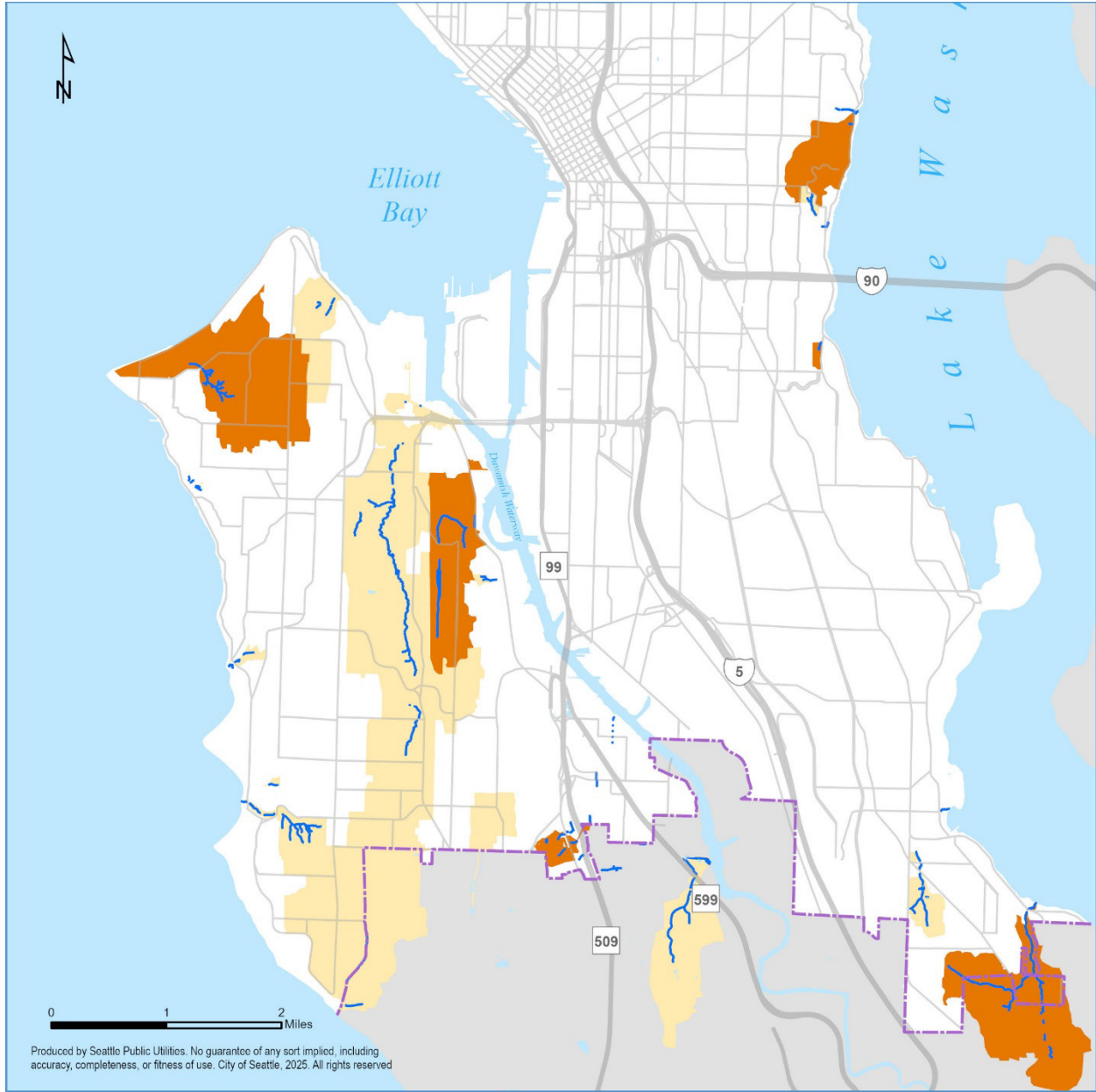
- **Small Lake Basins:** Discharges are to the small lake or the associated drainage basin (see Figure 2.5 for reference).
- **Designated Receiving Waters:** Discharges are to the designated receiving water or its associated drainage basin (see Figures 2.8 and 2.9 for reference).
- **Capacity-constrained System:** Capacity constraints in any downstream conveyance can modify the flow control requirements for discharges. This includes discharges directly to the capacity-constrained system or its associated upstream basin (see Figure 2.10 for reference). All ditch and culvert systems are capacity constrained. In addition, at the time of publication, the Director has determined the following areas to be capacity-constrained:
  - Densmore Basin
  - Portions of the Pike/Pine Corridor
  - South Park (including both separated storm and combined sewers)
- **Nutrient-critical Receiving Waters:** Discharges are to the nutrient-critical receiving water or its associated drainage basin (see Figure 2.5). At the time of publication, the Director has determined the following areas to be nutrient-critical receiving waters based on Ecology’s Water Quality Assessment:
  - Green Lake Basin

Drainage basin and system figures are provided for reference only. Refer to the SMC Chapter 22.801 definitions for determining basin limits and system types.



- Creek Watershed (Listed)
- Creek Watershed (Non-Listed)
- Small Lake Basins
- Nutrient-critical Basin
- Open Stream Channel
- Seattle City Limits

**Figure 2.5. North End Creek and Small Lake Basins.**



-  Creek Watershed (Listed)
-  Creek Watershed (Non-Listed)
-  Small Lake Basins
-  Open Stream Channel
-  Seattle City Limits

**Figure 2.6. South End Creek Basins.**

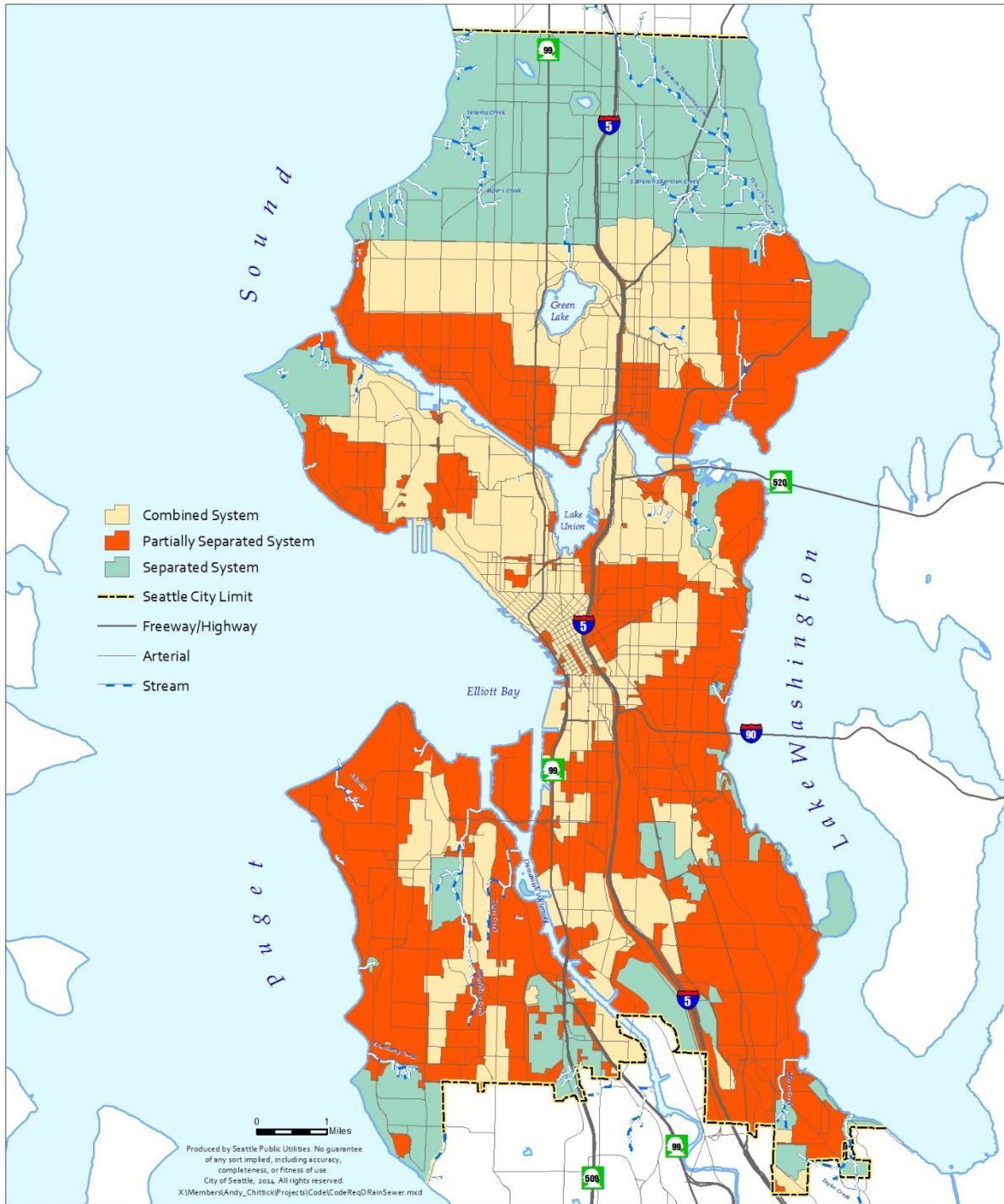
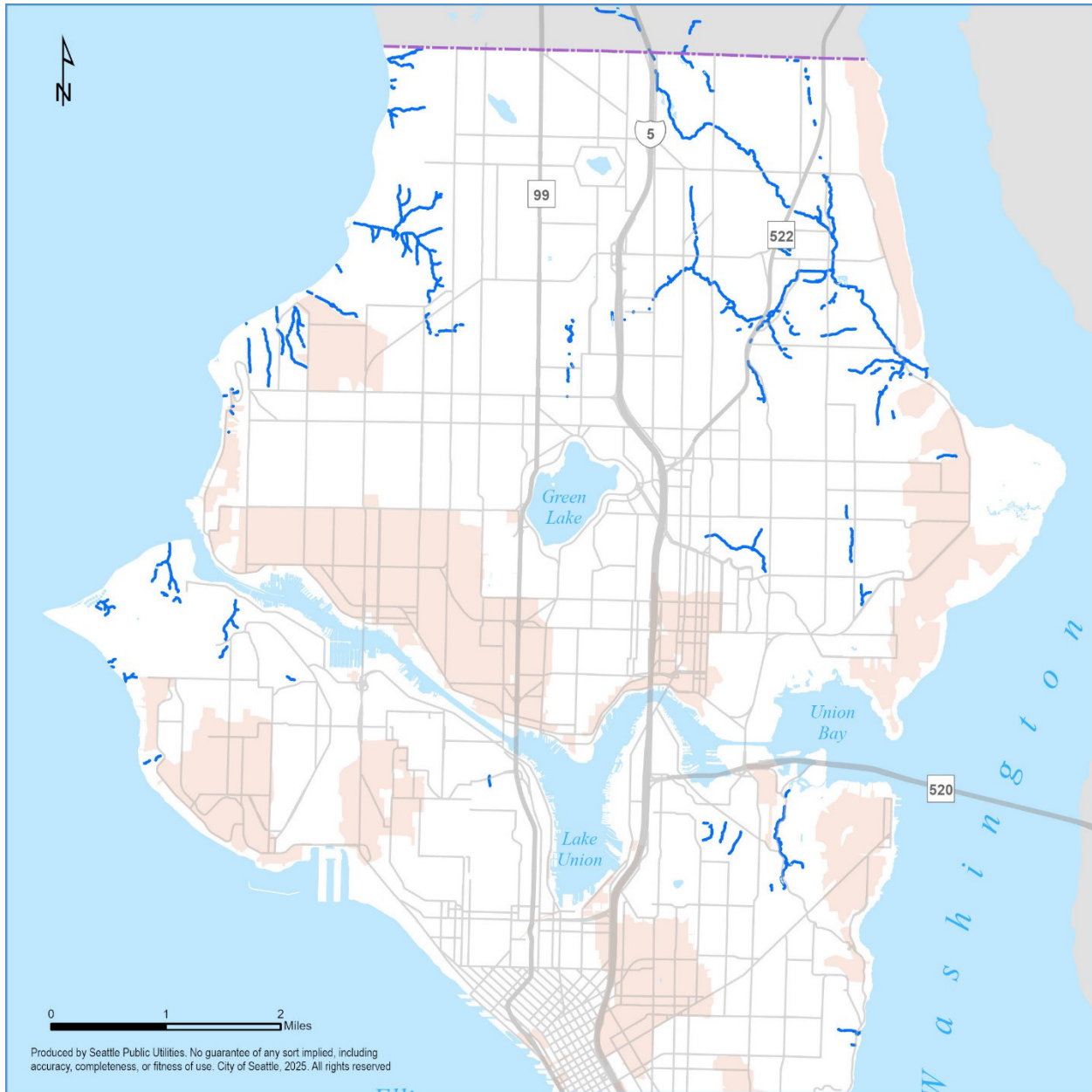
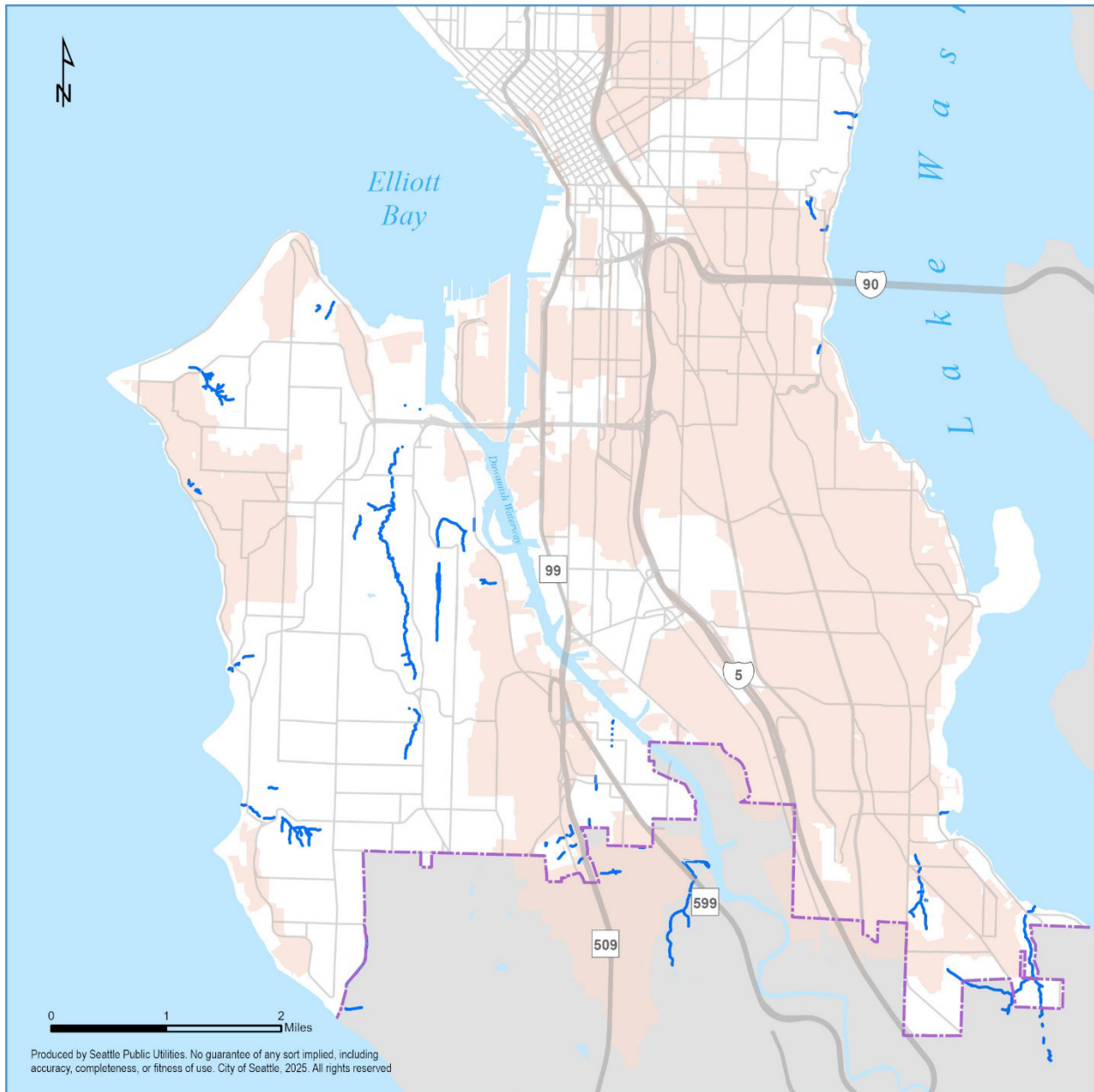


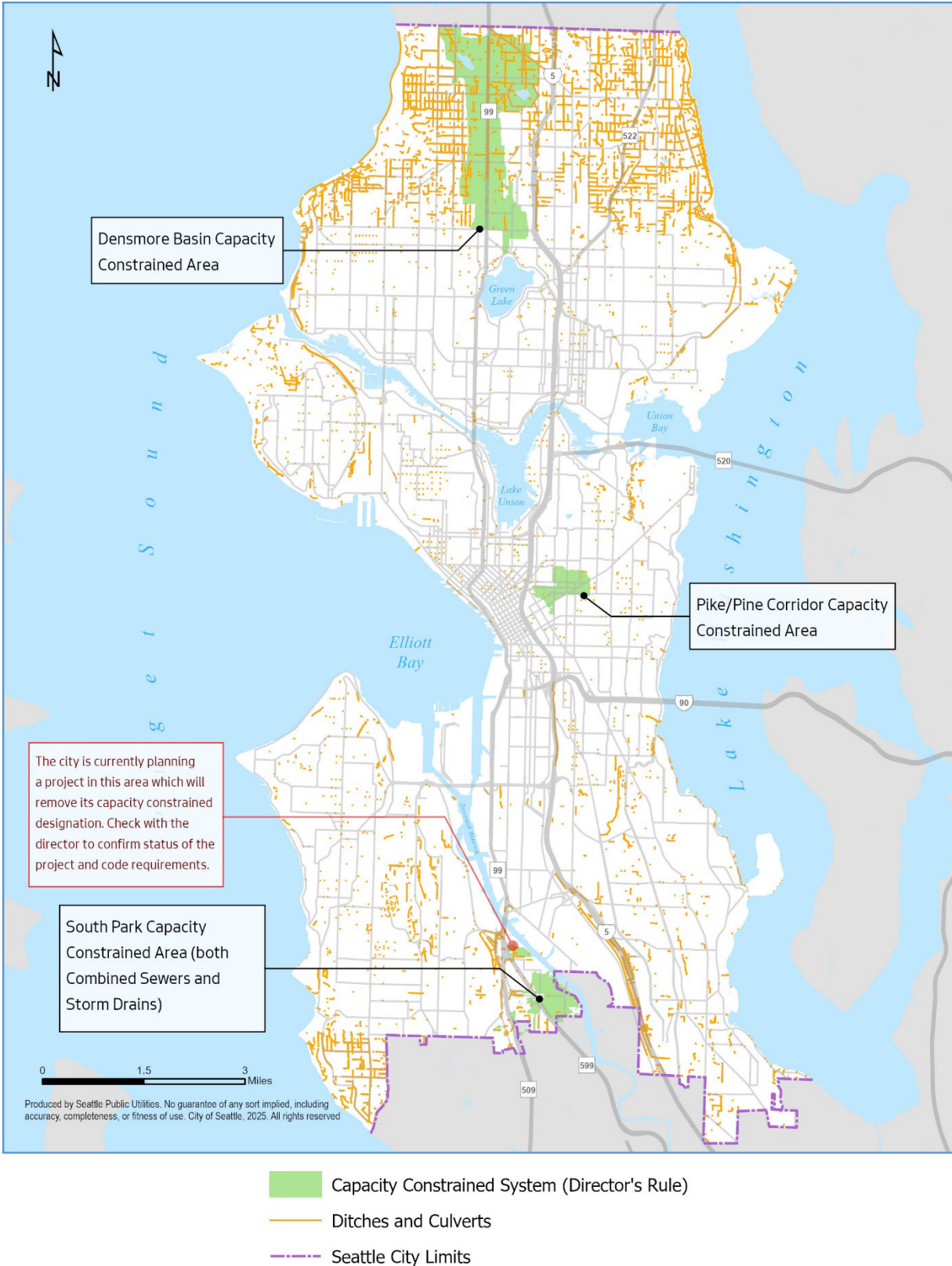
Figure 2.7. Public Combined Sewer Basins.



**Figure 2.8. North End Designated Receiving Water Drainage Areas.**



**Figure 2.9. South End Designated Receiving Water Drainage Areas.**



**Figure 2.10. Capacity-constrained Systems.**

## 2.4. Step 4 – Perform Site Assessment and Planning

After the applicable minimum requirements are identified, each project must evaluate project design considerations and perform a site assessment as outlined below. The goal of the site assessment and planning step is to identify any additional issues that must be addressed in association with stormwater management requirements. This step must be completed before any on-site stormwater management, flow control, or treatment BMPs are selected.

Site-specific factors to consider may include but are not limited to:

- Site boundaries and structures.
- Location and size of existing trees and their driplines / canopies within the site or offsite if the driplines/canopies of the trees extend onto the site.
- Site topography and dispersion feasibility (refer to *Volume 3, Section 3.1*).
- Soil conditions and infiltration capacity (refer to *Volume 3, Section 3.2*).
- Critical area issues (e.g., wetlands, streams / riparian corridors, flood plains, steep slopes, landslide-prone areas, and landfills or contaminated sites ).
- Contaminated soils or groundwater on or near the site (refer to *Section 2.4.7*).
- Groundwater elevations for temporary or permanent dewatering (refer to *Section 2.4.5*).
- Special circumstances (e.g., discharge to multiple drainage basins with differing requirements) (refer to *Section 2.7.1*).

Project proponents need to evaluate all applicable code requirements and conduct a full site assessment to characterize site opportunities and constraints before choosing and designing stormwater strategies. Additional information on drainage control reviews and required plan submittals is included in *Section 2.8*.

### 2.4.1. Identifying Key Project Components

*Chapter 3* presents steps for determining the applicable on-site stormwater management, flow control, and water quality treatment requirements. The following sections provide additional guidance on key project components that can significantly influence the project design and approach and should be considered part of the site assessment and planning step.

### 2.4.2. Project Boundaries and Structures

Project boundaries, nearby structures, and other related issues can directly affect designs for stormwater management. The following must be addressed before selecting a stormwater BMP:

- **Project Boundaries:** The project boundaries typically define the limits of disturbance and can affect the thresholds and applicable minimum requirements. Project boundaries generally coincide with the right-of-way, property line, or both but may include multiple properties. Refer to *Section 2.1*.

- **Setbacks:** Property lines, existing and proposed structures, and adjacent right-of-way boundaries must be identified and considered to evaluate project impacts on adjacent properties.
- **Location of Buildings:** All existing and proposed buildings must be identified, including all existing and proposed temporary and permanent structures (e.g., retaining walls) and hard surfaces (e.g., driveways and patios). Structures on neighboring properties can also affect stormwater BMP selection.
- **Foundations and Footing Drains:** The type of proposed foundations and footing drains, including location and extent, must be determined and include the following:
  - Conventional spread footings
  - Pile shaft
  - Basement
  - Footing drains and their associated point of discharge, where applicable (refer to *Section 3.2.1*)
  - Water-tight foundation without footing drains
  - Elevation of groundwater table in relation to the footings and basement

### ***2.4.3. Soil Condition Assessment***

The soil type and land cover types on the project site must be evaluated to assess the infiltration capacity of the site and the applicability of various stormwater BMPs. General requirements for determining infiltration feasibility, site characterization, and infiltration rate are presented in *Volume 3, Sections 3.2 and 4.5.2 and Appendix D*.

### ***2.4.4. Environmentally Critical Areas (ECAs)***

Additional regulatory requirements are placed on projects that are within or near ECAs, pursuant to SMC, Chapter 25.09. Depending on the type of ECA, additional requirements or limitations regarding stormwater management may apply.

The following information is needed to assess the impacts on and risks posed to wetlands and to determine the necessary protection level:

- Size, boundary, and characteristics of the proposed project site, wetland contributing drainage area, and the wetland and its buffer.
- Wetland type, category, and habitat score (based on the Wetland Protection Guidelines in Ecology's SWMMWW Volume I, Appendix I-C).
- Presence of rare, endangered, threatened, or sensitive species.
- Presence of breeding populations of native amphibian species.
- Legal access to the wetland.

### ***2.4.5. Temporary and Permanent Groundwater Dewatering***

It is important to have early estimates of the groundwater discharge from the project site during construction and once the project is complete. The site's distance to receiving waters or its location in areas where there may be perched, static, tidally influenced, or

hydraulically connected groundwater can have significant impacts on how the project is designed and which other minimum requirements apply. Refer to the Minimum Requirements for Flow Control (*Section 5.3*) and the Minimum Requirements to Ensure Sufficient Capacity (*Section 3.8*).

If temporary dewatering will occur, a Side Sewer Permit for Temporary Dewatering (SSPTD) may be required prior to starting dewatering at the site. The SSPTD may require compliance with a separate Temporary Dewatering Plan, water quality treatment, flow control requirements, and compliance monitoring. If the discharge is to a combined sewer system, a Discharge Authorization Letter from King County Industrial Waste will also be required and the discharge of any groundwater must be metered and billed through the SPU Sewer Submeter Program. See *Section 2.4.7* for additional requirements if the site has known or suspected soil or groundwater contamination or landfills near or within the site.

#### **2.4.6. Topography**

Because topography will influence how and where stormwater BMPs are incorporated onto the site, the existing and proposed topography must be considered. Important features to assess include the following:

- Key terrain features, such as closed depressions and grade breaks.
- Natural drainage courses, such as swales, ditches, rills, and gullies.
- Flow entering and exiting the property.
- Roadway grades and elevations.

#### **2.4.7. Site Assessment**

The following information must be evaluated as part of the site assessment:

- **Topography:** Topography within 500 feet of the site (geographic information system [GIS] topographic data may be used).
- **Steep Slope or Landslide-prone Areas:** Location of steep slope areas or landslide-prone areas within 500 feet of the site.
- **Septic Systems and Drain Fields:** Location of septic systems and drain fields in the vicinity of the site.
- **Underground Storage Tanks, Aboveground Storage Tanks, Residential Heating Oil Tanks:** Location of underground storage tanks, aboveground storage tanks, or residential heating oil tanks in the vicinity of the site.
- **Contaminated Sites and Landfills:** Location of contaminated sites and abandoned landfills within 100 feet of the site (refer to *Volume 3, Section 3.2* contaminated site requirements and resources).

For roadway projects or parcel-based projects with runoff from 5,000 square feet or more of impervious area to infiltrate, the following information must also be evaluated:

- **Site Geology:** Local site geology, including soil or rock units likely to be encountered, the groundwater regime, and geologic history of the site.
- **Water Supply Wells:** Location of water supply wells within 500 feet of the site.

- **Contaminated Sites and Landfills:** Location of contaminated sites and abandoned landfills within 500 feet of the site (refer to *Volume 3, Section 3.1 and 3.2* for restrictions for infiltration or dispersion BMPs in or near contaminated sites and landfills).
- **Groundwater Protection Areas:** Location of groundwater protection areas, or 1-, 5-, and 10-year time of travel zones for municipal well protection areas, or both.
- **Anticipated Site Use:** Street or highway, residential, commercial, or high-use site that may affect the water quality of stormwater runoff.

For projects proposing to use deep infiltration BMPs, the following information must also be reviewed and mapped:

- Regional geologic mapping.
- Publicly available geotechnical exploration data.
- Steep slope and landslide-prone areas within a quarter mile of the proposed location of the deep infiltration BMP.

Sources of data to evaluate site suitability include, but are not limited to, City of Seattle Department of Construction and Inspections (SDCI) Critical Area maps, Environmental Protection Agency (EPA), Department of Ecology (Ecology), Washington Department of Natural Resources (DNR) Subsurface GIS, Flood Hazard maps, and other mapping information available from the City of Seattle (including Seattle Public Utilities [SPU] and the Seattle Department of Transportation [SDOT]), King County, and consultant reports for other public agencies.) Any of the above information identified as part of the review must be shown on a map relative to the proposed infiltration location(s).

The following resources, in addition to field investigation, must be used to determine if soil or groundwater contamination may be present at the site or within the distance from the site that is required to be evaluated:

- EPA Superfund Program National Priorities List and Map (<https://www.epa.gov/superfund/search-superfund-sites-where-you-live>)
- EPA Resource Conservation and Recovery Act (RCRA) Program site list (<https://www.epa.gov/hwcorrectiveactioncleanups>)
- EPA mapping tool that plots the locations of Superfund and RCRA-regulated sites ([www.epa.gov/cleanups/cleanups-my-community](http://www.epa.gov/cleanups/cleanups-my-community))
- Ecology regulated contaminated sites (<https://ecology.wa.gov/Regulations-Permits/Guidance-technical-assistance/Site-Register-lists-and-data>)
- Ecology Toxics Cleanup Program website (<https://ecology.wa.gov/Spills-Cleanup/Contamination-cleanup/Cleanup-sites/Toxic-cleanup-sites>)

If contaminated soils or groundwater are expected at or near the site, plan for measures to treat contaminated construction stormwater or temporary and permanent groundwater to remove the contaminants before discharging from the site. In addition to City approvals, approvals from either Ecology, in the form of coverage under the construction stormwater

general permit or an individual permit, or King County, through a construction dewatering authorization, will be required.

If evidence of contamination is present or has been previously identified, the must reference applicable geotechnical and environmental engineering reports and, at a minimum, identify the following in the drainage control plans and, when required per *Section 2.8.3*, in the drainage report:

- Confirm the specific contaminants.
- Delineate the nature and extent of environmental contamination.
- Identify the contaminant sources.
- Demonstrate how contamination will be prevented from discharging from the site in construction stormwater runoff or dewatering discharges or from subsurface drainage such as footing drains. This may require temporary and/or permanent treatment.

Using the site assessment information, evaluate the site for infiltration and dispersion suitability based on the limitations and setbacks provided in *Volume 3, Sections 3.1 and 3.2 and Appendix D, Section D-2.2.4*. Based on this evaluation, identify all portions of the site where infiltration may be feasible. Additionally, for underground injection control (UIC) wells, setback and site restrictions must be in accordance with the UIC requirements in Volume I of Ecology’s SWMMWW. UIC wells are regulated by Ecology under federal and state laws and must comply with all federal and state requirements.

### **2.4.8. Landscaping Principles**

Before designing the site and stormwater infrastructure, consider the following:

- Maintain and use natural drainage patterns.
- Preserve and use natural features and resources, including trees.
- Preserve native vegetation (refer to BMP T5.40, Preserving Native Vegetation, in Volume V of Ecology’s SWMMWW).
- Create a multifunctional landscape using the natural site hydrology as a framework for site design.
- Confine and phase construction activities to minimize disturbed areas and impacts on ECAs and their associated buffers.
- Plant new trees in proximity to ground-level impervious surfaces for on-site stormwater management and/or flow control credit.
- Minimize or prevent compaction and protect soils.

Soil type, slope, exposure, depth to groundwater, and the selection of plants chosen for the site will all influence the proposed landscape management approach. However, five basic principles must be considered for all sites to be successful in controlling the export of soil or organic matter, fertilizers, and pesticides in stormwater runoff:

- Minimize bare soil areas.
- Reduce water demand.

- Reduce extent of turf area and manage remaining turf to reduce pollutant impact.
- Select plants with sustainability in mind.
- Reduce or eliminate fertilizers, pesticides, herbicides, and fungicides and, where required, manage application wisely.

Details of each of the five basic principles are provided in the following subsections. The recommendations discussed for each principle are intended as a framework for a variety of site situations, from individual homes to large parks and golf courses. The specific application of each of these principles will vary from site to site depending on the type of landscaping (e.g., grass lawn, planter bed) that is being managed.

#### **2.4.8.1. Principle 1: Minimize Bare Soil Areas**

Bare soil areas are one source of solids that can be mobilized and carried downstream by rainfall. Minimizing bare soil areas makes it less likely that solid particles will be dislodged by rainfall. Landscapes can be managed to minimize bare soil using one or more of the following:

- Establish dense plantings of pest-resistant groundcover to shade out weeds. Some easy-care recommendations are rock rose (*Cistus sp.*), snowberry (*Symphoricarpo albus*), salal (*Gaultheria shallon*), and kinnikinnick (*Arctostaphylos uva-ursi*).
- If bare soil areas are required, as in planting beds or ball diamonds, surround the bare area with an area of grass or groundcover to filter out solids that may be picked up by stormwater runoff.
  - The denser the grass or groundcover, the more effective it will be in capturing solids in runoff.
  - The filtering area should be as level as feasible, minimizing low spots, where runoff can concentrate and create channels.
  - In general, filtering areas should be about one-fourth as long (along the flowpath) as the area contributing flow, assuming that the slopes are gentle (less than 10 percent). For flat, level areas without dips, this length can be reduced.
- Promptly repair bare patches in lawns or groundcovers that could contribute solids to stormwater runoff.
- Do not place bark or loose mulch on slopes where it can be carried to storm drains or receiving waters.

#### **2.4.8.2. Principle 2: Reduce Water Demand**

Reducing the need for irrigation reduces the potential movement of pollutants, conserves water, and saves money.

- Use drought-tolerant or native vegetation.
- Install underground irrigation systems timed to water at night or drip irrigation systems. Systems with automatic leak detection capability will reduce inadvertent runoff due to a break in the system.
- Increase the organic content of soils to improve its water-retention capability.
- Terrace sloped areas to improve water retention.

### 2.4.8.3. *Principle 3: Reduce Turf Area and Manage Remaining Turf to Reduce Pollutant Impact*

Turf requires care to look attractive. In addition to mowing, turf areas typically require water, fertilizer, and weed and disease control. However, some practices can reduce or minimize the chemical controls needed.

- Amend soil with organic matter per *Volume 3, Section 5.1*.
- Decide whether all lawn areas need the same level of upkeep: let some areas have a less formal look, if possible, and reduce or eliminate fertilizer and pesticide use in those areas. Apply fertilizer only if the need is indicated by soil testing and apply it at rates recommended by a soil testing laboratory for current conditions.
- Rely on irrigation and lawn aeration as the primary tools for maintaining healthy turf.
- Remove thatch each year to increase water penetration to grass roots and reduce runoff.
- In shady areas, plant groundcovers rather than grass. Turf grasses usually need at least partial sun to remain vigorous.

### 2.4.8.4. *Principle 4: Select Plants with Sustainability in Mind*

Plants differ in their ability to cope with different soils, rainfall conditions, pests, diseases, and microclimates. Techniques for creating landscapes requiring less intervention include the use of resilient plant species, the selection of plants with adaptations for particular environments, and the creation of optimal microenvironments. Less watering and a reduced need for pesticide and fertilizer application means less potential for pollutants to leave the site.

- Select disease-resistant plants.
- Select drought-resistant groundcovers, shrubs, and trees in areas with poor soil or little shading.
- Group plants in clusters with tree, shrub, and groundcover layers to create a better microenvironment and to return organic matter back to the soil.
- Plant large, evergreen trees to help reduce the size of stormwater flows.
- Include plants in the landscape that are important for and sustain beneficial insects that control pests such as parasitic wasps.
- Use dense plantings or close spacing to shade out weeds rather than herbicides.
- On steep slopes or erosion-prone areas, use plants with fibrous roots, including but not limited to the following:
  - Ornamental grasses and lawn grasses
  - Dwarf rose (*Rosa gymnocarpa*) – native
  - Nootka rose (*Rosa nutkana*) – native
  - Rock rose (*Cistus* sp.)
  - Rugosa rose (*Rosa rugosa*)
  - Evergreen huckleberry – native

- Salal (*Gaultheria shallon*) – native
- Salmonberry (*Rubus spectabilis*) – native
- Snowberry (*Symphoricarpos albus* or *Symphoricarpos mollis*) – native
- Sword fern (*Polystichum munitum*) – native
- Use wetland plants in areas with seeps or a high groundwater table.
- Attend to installation details. Write enforceable planting specifications that include details such as soil preparation, plant spacing, plant condition and size, planting depth, transplant handling, and irrigation. During installation, inspect the planting to prevent the use of shortcuts such as blowing the soil mixture around root balls rather than digging the roots into amended native soils. Where possible, specify and install bare-root plants for improved adaptation to native soils.

#### **2.4.8.5. Principle 5: Reduce or Eliminate Fertilizer, Pesticide, Herbicide, and Fungicide Use and Where, Required, Manage Application Wisely**

Use of fertilizers, pesticides, and herbicides should be reduced or eliminated to the maximum extent feasible. However, if the landscape plants and turf simply will not survive without fertilizer and some amount of pest management, an Integrated Pest Management plan or landscape management plan (refer to *Appendix I*) must address when and how these actions will be taken so that the impact on water quality will be reduced.

- Keep plants healthy by building healthy soil using composted organic material. Healthy plants can better resist diseases and insect pests.
- Tailor fertilizer formulation to lawn needs. Apply fertilizer only if the need is indicated by soil testing and apply it at rates recommended by a soil testing laboratory for current conditions. Adjust the fertilizer application rate and timing of applications to avoid carry-off in stormwater runoff.
- Reduce the phosphorus (P) concentration in fertilizers when possible by using a low phosphorus formulation or formulations containing only nitrogen or potassium.
- Use an Integrated Pest Management approach to control pests (see *Appendix I*). Include non-chemical control options as a first defense against pests.
- Encourage a diverse insect community in your landscape: Beneficial insects can help control pests, especially pests of trees and shrubs.
- Target pesticide application to the specific pest of concern. Avoid pesticide “mixes” targeting generic problems (such as weed and feed) unless you need each of the formulations for a current problem.
- Apply pesticides only during the life stage when the pest is vulnerable.
- Use fungicides sparingly; they disrupt the base of aquatic food webs. If you need to use fungicides, spray formulations with faster break-down times.
- Tolerate some weeds.

### 2.4.9. *Site Design Considerations*

To manage stormwater effectively and efficiently, site design for both the construction phase and the post-development condition should coincide with the design and layout of the stormwater infrastructure. Efforts should be made, as required and encouraged by development codes, to conserve natural areas, retain native vegetation, including tree canopy, reduce impervious surfaces, and integrate stormwater controls into the existing site layout to the maximum extent feasible. With careful planning, these efforts will not only help achieve the minimum requirements contained in the Stormwater Code but can also reduce impacts from development projects and the costs of water quality treatment and flow control.

Before designing the site and stormwater infrastructure, consider the following:

- Stormwater:
  - Identify the approved point of discharge and conveyance system flowpath, both pipe and topographically.
  - Manage stormwater runoff (quantity and quality) as close to the point of origin as feasible.
  - Minimize the required quantity of stormwater collection and conveyance systems.
  - Use simple, non-structural methods for stormwater management.
  - Use dispersion, infiltration, rainwater harvesting, and alternative surface BMPs where feasible
- Impervious and Pervious Surfaces:
  - Fit development to the terrain to minimize land disturbance.
  - For sites with varied soil types, locate impervious areas over less permeable soil (e.g., till). Minimize development over more porous soils. Use areas of porous soils for bioretention and permeable pavement.
  - Cluster buildings together.
  - Minimize impervious surfaces (e.g., buildings and sidewalks).
  - Minimize pollution-generating hard surfaces (PGHS) (e.g., areas subject to vehicular use such as driveways and parking strips).
  - Minimize pollution-generating pervious surfaces (PGPS).

## 2.5. Step 5 – Calculate Land-disturbing Activity and New Plus Replaced Hard Surface

The thresholds triggering specific Minimum Requirements for Flow Control are based on the amount of the project's new hard surface, replaced hard surface, converted native and nonnative vegetation, and land-disturbing activity. Hard surface means an impervious surface, a permeable pavement, or a vegetated roof. Refer to SMC, Chapter 22.801 and *Appendix A* for detailed definitions of these key terms.

Note that open, uncovered retention or detention facilities shall not be considered as hard surfaces for the purpose of determining whether the minimum requirement thresholds are

exceeded. However, these facilities shall be considered impervious surfaces for the purposes of stormwater facility sizing.

Areas with underdrains designed to remove stormwater from the subgrade (e.g., playfields, playground areas, sports fields, athletic fields, rail yards) must be considered as hard surfaces for the purposes of determining whether the minimum requirement thresholds are exceeded. Note: refer to *Section 2.5.1* for a clarification of threshold determination for sports fields.

All areas connected to the underdrains and surrounding underdrain aggregate with free-draining subbase material or drainage layer, such as a sand or gravel layer or a manufactured drainage mat, must be counted as hard surface area regardless of the distance between the surface and the underdrain or spacing of underdrains. Natural lawn or natural turf areas that do not have a free-draining sand or gravel layer or other type of drainage layer connected to the underdrain or underdrain aggregate are hard surface areas if there are multiple rows of underdrains that are spaced closer than 25 feet apart. Artificial turf is a hard surface unless there are no underdrains, all layers used are permeable, the soil below the turf is not compacted, and the soil is compost amended per the requirements for *Volume 3, Section 5.1*. In addition, refer *Volume 3, Section 5.6.2.5 - Design of Underdrained Surfaces to be Equivalent to Permeable Pavement Surfaces*.

For the purposes of determining minimum requirements, a deck with open grating or spacing between boards that allows rainwater to pass through the deck surface is not considered a hard surface only if the entire area below the deck is a pervious surface with amended soils that meet the requirements of *Volume 3, Section 5.1 Soil Amendment BMP*. Note: this interpretation is only applicable to the Stormwater Code and Manual and not necessarily to any other City codes, Director's rules, or policies (e.g., Shoreline Master Program in the Land Use Code).

Overlaying existing asphalt, concrete, or brick pavement with asphalt or concrete without expanding the area of coverage is not a new or replaced hard surface if the existing pavement remains and any grinding does not expose the top of the base course or subgrade.

The amount of native vegetation that is removed and replaced with lawn, landscaping, and pasture groundcover must also be calculated.

New plus replaced hard surface areas and converted native vegetation must be quantified separately for work within and outside the right-of-way.

### ***2.5.1. Underdrained Sports Fields***

Underdrained sports fields are considered a hard surface for most thresholds (e.g., On-site Stormwater Management, Flow Control, Drainage Review, etc.) but also a pollution-generating pervious surface for Water Quality Treatment thresholds. Refer to the definitions in *Appendix A*.

When determining if Water Quality Treatment is required, underdrained sports fields (natural or artificial turf) are evaluated as pollution-generating pervious surfaces. Refer to *Section 2.6*.

When evaluating all other stormwater code thresholds, underdrained sports fields are evaluated as hard surfaces.

### **2.5.2.      *The Difference Between “New” and “Replaced” Hard Surfaces***

While most thresholds for requirements in the Seattle Stormwater Code and associated Director’s Rules are based on “new plus replaced hard surfaces,” there are a few thresholds based on “new hard surface.” One example is the Flow Control thresholds for Roadway or Parcel-based Projects in Creek Basins. Refer to *Sections 4.1 and 4.3*.

The following are examples of, but are not limited to, when a hard surface is “new” or “replaced” based on the Stormwater Code definitions.

#### ***Structures***

The following are examples of structures that are a “new hard surface”:

- An existing structure is removed, including the foundation, and a new structure is built, even if the new structure is in the same footprint as the structure that was removed.
- An existing structure is removed and a structure is built in a new location.
- A structure is expanded beyond the existing footing.
- An existing hard surface is upgraded or changed to a structure.
- An existing gravel surface is upgraded or changed to a structure.
- A structure is built where there was previously a pervious surface.

The following is an example of a structure that is a “replaced hard surface”:

- The existing structure is removed down to the top of the foundation, but the foundation is not removed, **and** the “replaced” structure is built on the existing foundation.

The existing foundation must remain to be considered a “replaced” hard surface. Otherwise, it is a “new” hard surface.

#### ***Non-structure Hard Surfaces***

The following are examples of “other” (non-structure) surfaces that are “new hard surface”:

- An existing hard surface is removed down to the subgrade and the subgrade is altered by grading activities, such as excavating the subgrade or filling to change the grade, and a hard surface is installed.
- An existing hard surface is removed and a new hard surface is installed in a different location.
- A surface is changed from a pervious surface to a hard surface, for example:
  - Converting lawn to permeable pavement, or

- upgrading from dirt to gravel, a bituminous surface treatment (“chip seal”), asphalt, concrete, or a hard surface structure).
- A surface is upgraded from gravel to chip seal, asphalt, concrete, or a hard surface structure.

The following is an example of an “other” (non-structure) hard surface that is a “replaced hard surface”:

- The existing hard surface is removed down to the subbase or subgrade (where there is no subbase) and replaced, but the subgrade (i.e., soils below the subbase) is not graded (excavated or backfilled).

If grading activities for the subgrade occur, such as excavating the subgrade or filling to change the grade beyond what is required to repair the existing hard surface or base course, then the hard surface is “new.”

### ***2.5.3. Remodels and Reconstruction That Maintain Existing Foundations***

The following clarifies when a remodel of an existing building or construction on an existing foundation is defined as a “replaced hard surface.” For the purposes of this definition, the “foundation” is the building footing, stem wall, and sill plate.

If the roof, walls, and any floor joists are removed, exposing the top of either the sill plate, stem wall, or footing, and the structure is re-built, then the area where the roof was removed is considered “replaced hard surface.” This is the case even if an existing slab on grade or a basement remains.

In some cases, the foundation may be replaced but the structure above remains. In these cases, these areas are not considered new or replaced hard surfaces, such as:

- Basement conversions where the basement is deepened by excavating and adding new foundation, but the structure above the basement level is retained.
- Remodels that crib the existing structure to raise it and add new structure below, and the roof, walls, or floor joists of the existing structure are retained.

Figures 2.11, 2.12, 2.13, 2.14 and 2.15 include examples of remodels and reconstruction with the new and replaced hard surfaces identified.

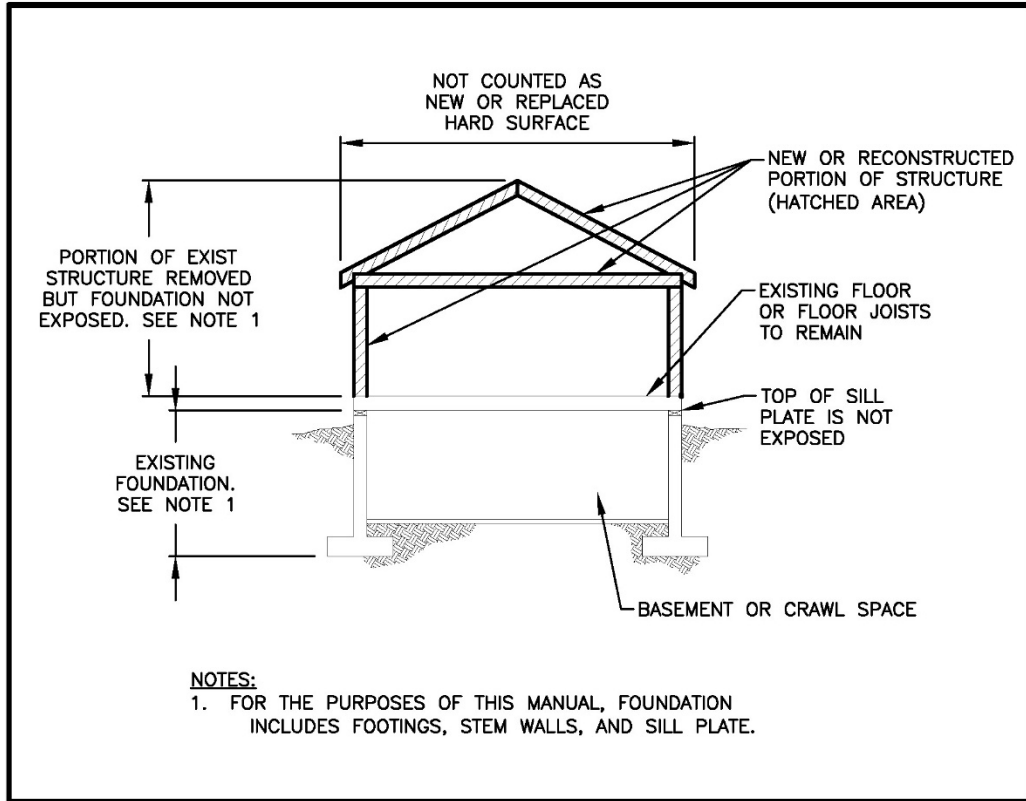


Figure 2.11. Example of Existing Hard Surface to Remain with Existing Floor Joists to Remain.

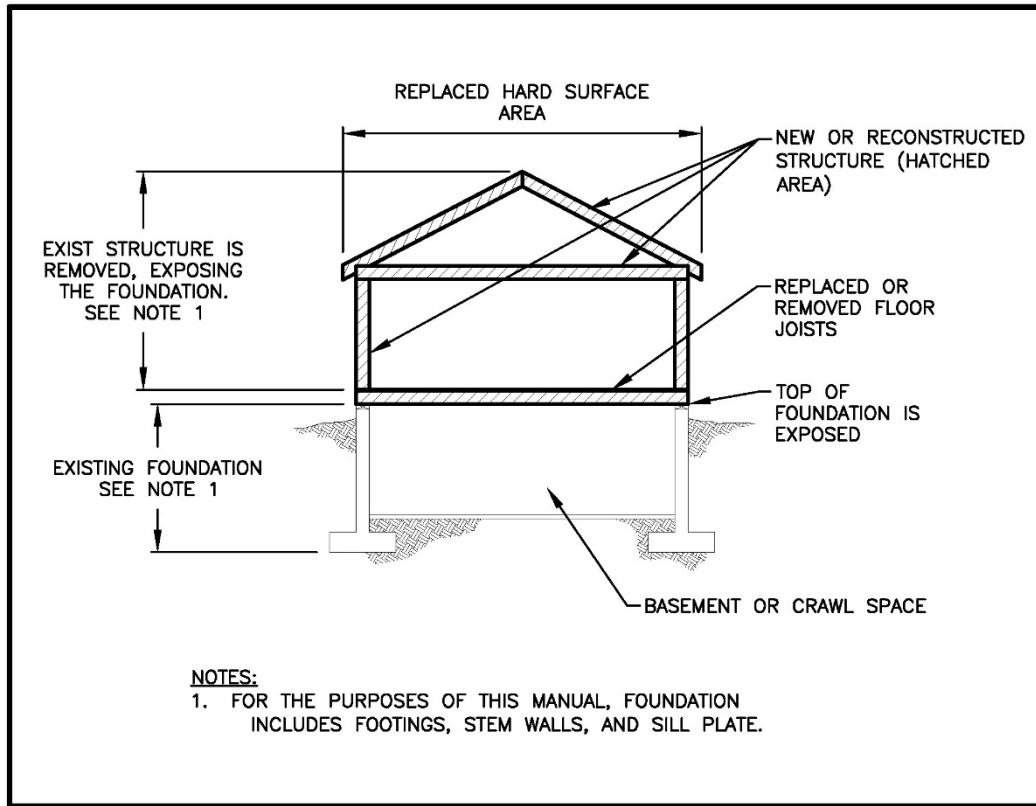
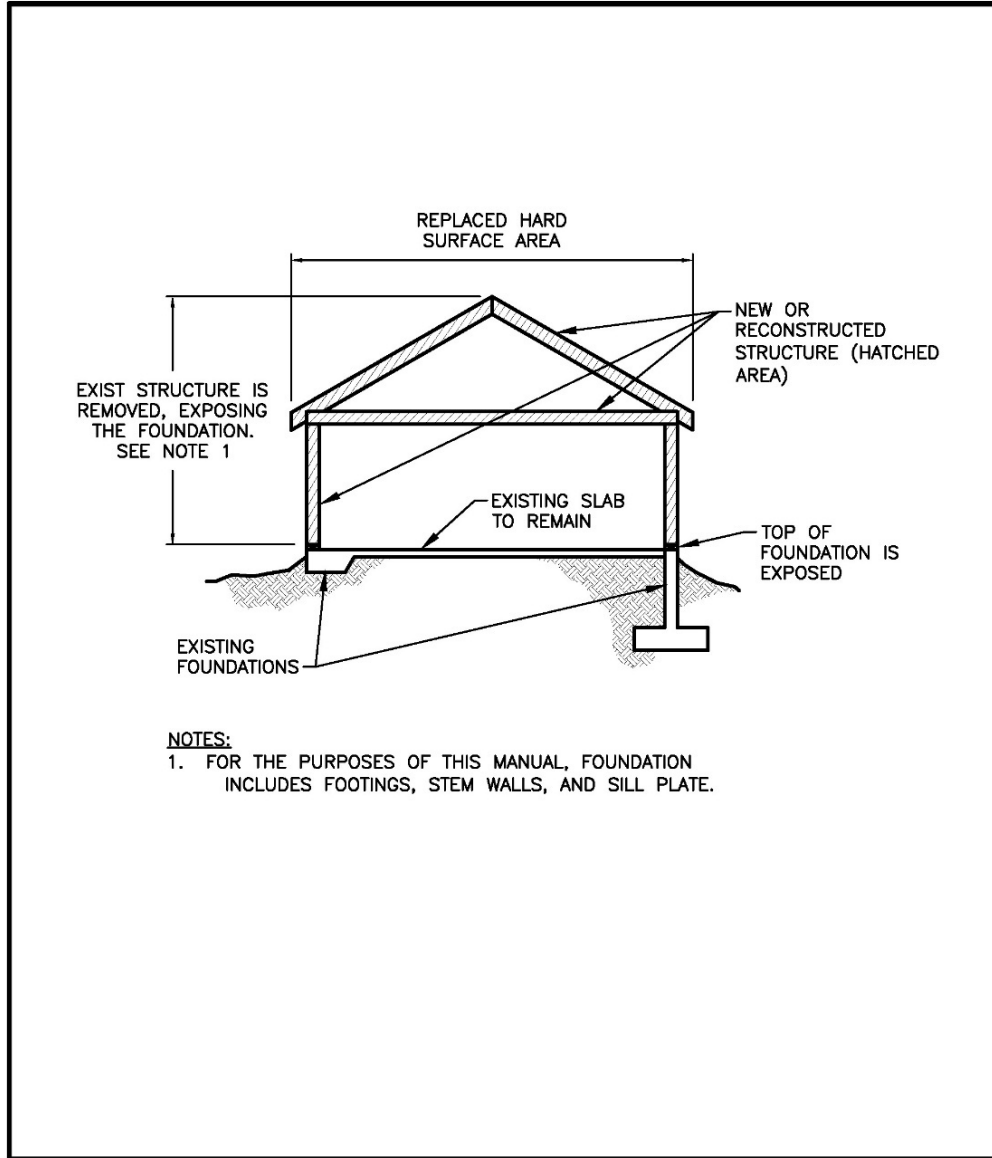


Figure 2.12. Example of Replaced Hard Surface with Floor Joists Removed or Replaced.



**Figure 2.13. Example of Replaced Hard Surface with Structure Removed Down to Slab on Grade/ Footings.**

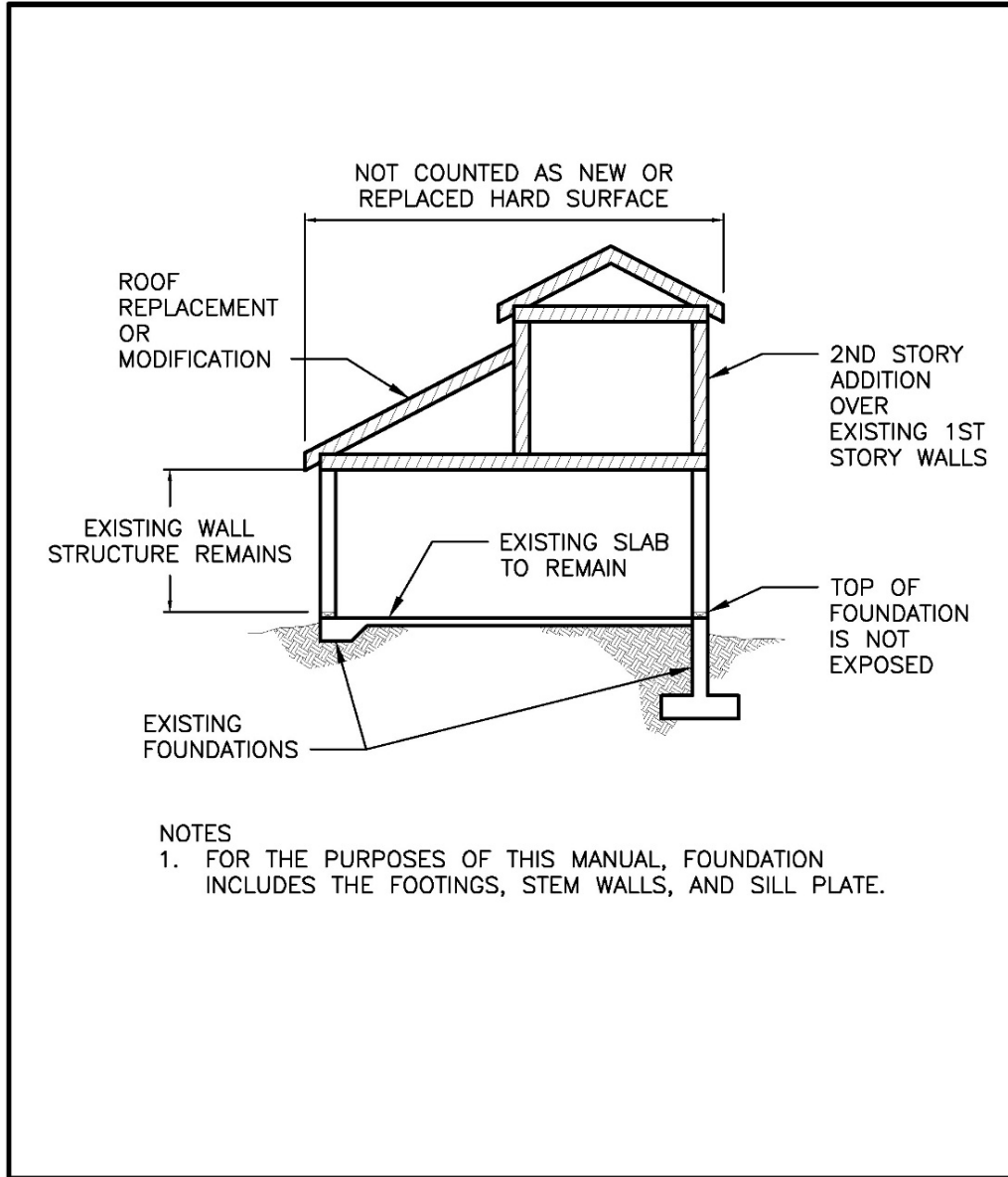


Figure 2.14. Example of Existing Hard Surface to Remain with Existing 1st Floor Walls Remaining.

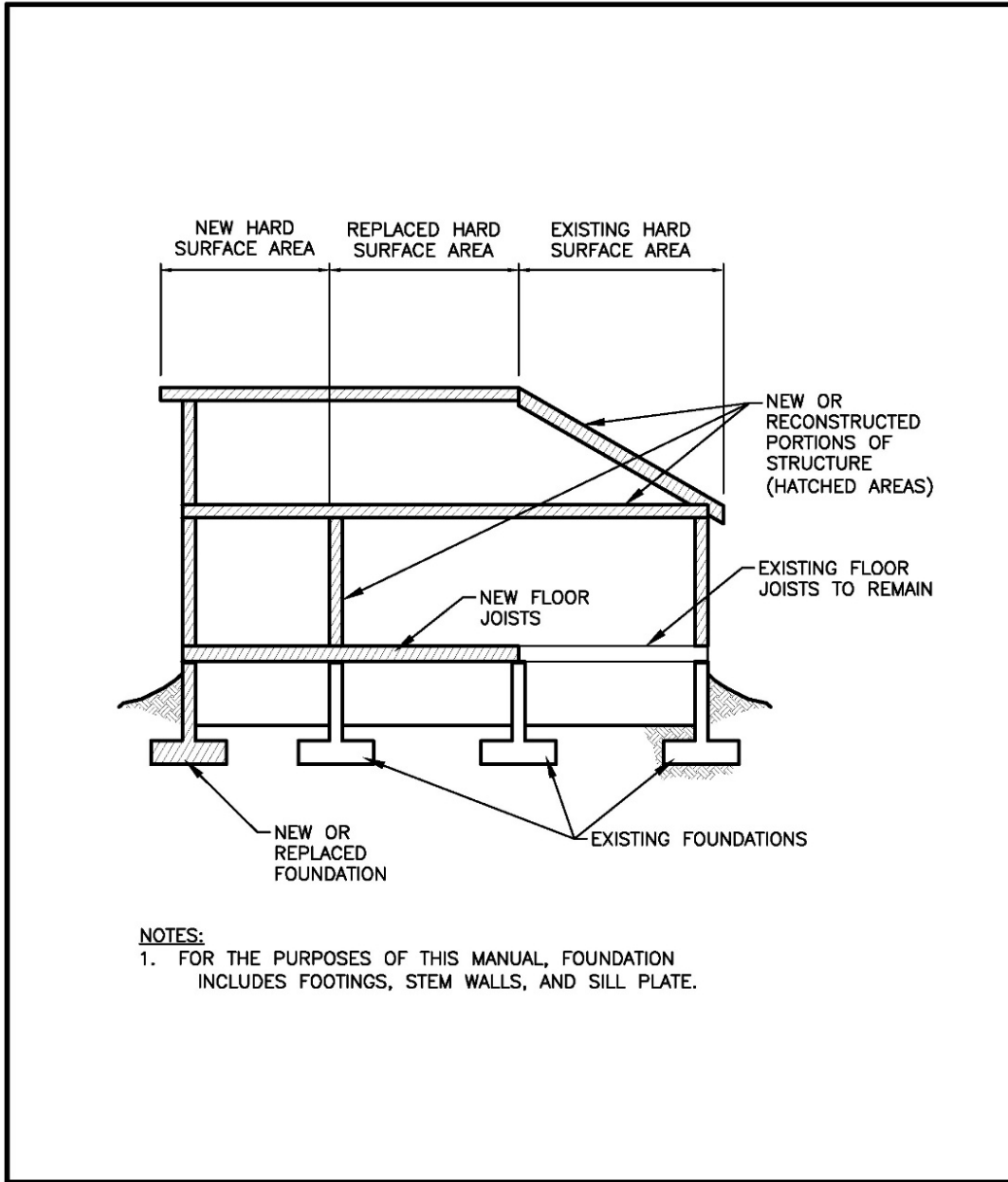


Figure 2.15. Example with New, Replaced, and Existing Hard Surfaces.

## 2.6. Step 6 – Calculate New Plus Replaced Pollution-generating Surface

The thresholds triggering specific Minimum Requirements for Water Quality Treatment are based on the total amount of the project’s new plus replaced pollution-generating hard surface (PGHS) and new plus replaced pollution-generating pervious surface (PGPS). PGHS and PGPS include areas that are considered a significant source of pollutants in stormwater runoff. Refer to SMC, Chapter 22.801 and *Appendix A* for detailed definitions of these key terms.

Examples of PGHS include areas subject to vehicular use (including permeable pavement); industrial activities; and outdoor storage of erodible or leachable materials, wastes, or chemicals. Metal roofs are considered a PGHS unless coated with an inert, non-leachable material (e.g., baked-on enamel coating).

Examples of PGPS include lawns, landscaped areas, golf courses, parks, cemeteries, and sports fields (natural and artificial turf). Note: refer to *Section 2.5.1* for a clarification about underdrained sports fields. Refer to SMC, Chapter 22.801 and *Appendix A* for detailed definitions of these key terms.

Typically, new plus replaced PGHS and PGPS must be quantified separately for work within and outside the right-of-way.

## 2.7. Step 7 – Determine Which Minimum Requirements Apply

An overview of the minimum requirements applicable to all project types is included in *Chapter 3*. In addition, an overview of the minimum requirements specific to each project type is included in *Chapter 4*.

Based on the information obtained from Step 1 through Step 6, the applicable minimum requirements for specific project types can be determined for:

- Soil amendment (*Section 5.1*)
- On-site stormwater management (*Section 5.2*)
- Flow control (*Section 5.3*)
- Water quality treatment (*Section 5.4*)

In limited cases, there may be potential Exemptions, Adjustments, or Exceptions to the minimum requirements of the Stormwater Code. Refer to Chapter 7 for more information.

In addition, certain locations in the City may be subject to additional or modified requirements based on other Director’s Rules, Policies, and Tips, such as:

- SPU Director’s Rule DWW-210 – Public Drainage System Requirements
- SPU Director’s Rule DWW-430.1 – Flow Control Requirements for Projects in Identified Public Combined Sewer Basins (SODO/Downtown Waterfront)

- SPU Director’s Rule DWW-420.1 – Yesler Terrace Community Director’s Rule: Allowable Stormwater, Groundwater, and Sewer Release Rates to the Combined Sewer System and Infiltration Zones
- SDCI Tip 505 – High Point Impervious Surface Calculation
- SDCI Director’s Rule 14-2008 – Infiltration Facilities in Peat Settlement-prone Areas
- SPU Design Standards and Guidelines - including the GSI Manual
- Streets Illustrated (Seattle Right-of-Way Improvements Manual)
- Seattle Standard Plans and Specifications

Note: Under certain circumstances, the ECA code requires Water Quality Treatment and Flow Control in some locations where it is not required per this Manual (e.g., shoreline areas, riparian corridors).

### **2.7.1. Special Circumstances**

Some projects do not closely fit defined project types or have complicating elements. These projects require a case-by-case review (no review of special circumstances sets a precedent) to determine the applicable minimum requirements. These projects must first go through a pre-permit review process to assist the proponent in identifying the specific minimum requirements to be applied. Project requirements will typically be based on requirements for parcel-based projects (refer to *Section 4.1*), roadway projects (refer to *Section 4.3*), or a combination in addition to minimum requirements for all projects (refer to *Chapter 3*).

The following list is not comprehensive but gives the proponent an indication of the complexity of the special circumstances. Examples of special circumstances projects include:

- Bridges or tunnels
- Construction over water
- Closed-contour low point basins
- Draining into more than one basin with conflicting requirements
- Multiple blocks or a subdivision
- Railroads including light rail
- Rail stations including light rail
- Work performed in more than one jurisdiction
- Land disturbing activity that includes more than one project type (e.g., utility projects and pavement maintenance projects).

Projects that propose to develop multiple blocks or a subdivision have the potential for greater impacts to the existing drainage system or public combined sewer. These projects may require a more comprehensive downstream analysis examining a larger range of flow and discharge conditions to demonstrate that the project meets the requirement to ensure sufficient capacity (SMC, Subsection 22.805.020H) and will not cause a significant adverse impact to receiving waters or up-gradient or down-gradient properties (SMC, Subsection 22.805.020A).

Similarly, projects that discharge to closed-contour low point basins may be required to demonstrate the project will not cause a significant adverse impact to down-gradient properties (SMC, Subsection 22.805.020H) and increase either the frequency or severity of flooding, including for peak flows with a 1 percent annual probability.

Projects that discharge to multiple drainage basins will be analyzed separately by drainage basin. To determine which minimum requirements apply and which part of the drainage system or public combined sewer will be analyzed to ensure sufficient capacity, the proponent must prepare exhibits showing the land-disturbing activity anticipated for each receiving water and drainage basin and downstream drainage system. Refer to *Section 2.3*.

The Director of SPU may determine that subbasins within the public combined sewer system or designated receiving waters are sufficiently distinct and separated to be analyzed independently and as separate areas. Discharges to each of the small lake basins will be analyzed independently and are considered separate areas.

Discharges to each creek basin will be analyzed independently and are considered separate areas. In addition, discharges to distinct branches of a creek or where the two points that discharge to a single creek branch are more than 1/4 mile apart will be analyzed independently and are considered separate areas.

If a project requires compliance with more than one flow control standard (e.g., the Peak Control Standard and the Pre-developed Pasture Standard), the facility must be sized to meet all applicable standards.

Once the applicable minimum requirements have been identified, proceed to *Volume 3, Chapters 3, 4, and 5* to begin the BMP selection and design process.

## 2.8. Step 8 – Determine Drainage Control Review and Submittal Requirements

Most construction and land use projects in Seattle require a permit from SDCI, SDOT, or both. Drainage Control Review types include: Preliminary Drainage Review, Standard Drainage Review, and Comprehensive Drainage Review. The type of Drainage Control Review is based on the project type and the proposed total amount of new plus replaced hard surface and the total amount of land-disturbing activity.

Forms and submittal documents for projects not conducted in the right-of-way (typically on private property) can be found on the SDCI website ([www.seattle.gov/sdci/codes/codes-we-enforce-\(a-z\)/stormwater-code](http://www.seattle.gov/sdci/codes/codes-we-enforce-(a-z)/stormwater-code)).

Forms and submittal documents for projects conducted in the right-of-way can be found on SDOT's website ([www.seattle.gov/transportation/permits-and-services/permits/street-improvement-permits](http://www.seattle.gov/transportation/permits-and-services/permits/street-improvement-permits)).

The City also has resources available on the SDCI website ([www.seattle.gov/sdci](http://www.seattle.gov/sdci)), including relevant “Tips” with detailed information for construction projects as well as SDCI forms. In addition, SDCI staff may be contacted on the SDCI website (<https://www.seattle.gov/sdci/about-us/contact-us>).

Refer to *Section 2.7.1* for additional information about complex projects.

### 2.8.1. Preliminary Drainage Review

Preliminary Drainage Review is required for Master Use Permits (MUPs) and is summarized below.

<b>Stormwater Code Language</b>
<p>SMC, 22.807.020.A – <i>Thresholds for drainage control review. Drainage control review and approval as described in subsection 22.807.020.B is required for any of the following:</i></p> <ol style="list-style-type: none"> <li>1. <i>Preliminary drainage review and approval is required for applications for the following approvals:</i> <ol style="list-style-type: none"> <li>a. <i>Subdivisions (Chapter 23.22);</i></li> <li>b. <i>Short plats (Chapter 23.24);</i></li> <li>c. <i>Unit lot subdivisions (Sections 23.22.062 and 23.24.045);</i></li> <li>d. <i>Lot boundary adjustments (Chapter 23.28); or</i></li> <li>e. <i>Master use permits that would allow development that includes 750 square feet or more of new plus replaced hard surface or 5,000 square feet of land disturbing activity where the Director has determined that a preliminary drainage review is required considering, but not limited, to the following attributes of the site:</i> <ol style="list-style-type: none"> <li>1) <i>Location within an environmentally critical area or buffer;</i></li> <li>2) <i>Proximity and tributary to an environmentally critical area or buffer; and</i></li> <li>3) <i>Proximity and tributary to an area with adequacy, erosion, water quality, or flooding problems.</i></li> </ol> </li> </ol> </li> </ol>

The submittals required for Preliminary Drainage Review must include the following at a minimum. Refer to *Appendix B* for additional requirements for specific types of MUPs:

- Preliminary Drainage Control Plan\*. The required elements for a Preliminary Drainage Control Plan are the same as for a Drainage Control Plan for Standard or Comprehensive Review with the following differences:
  - On-site Stormwater Management BMPs for proposed lots or parcels where the future development is unknown must show conceptual BMPs.
  - Tables for estimated new and replaced hard surface area for each proposed lot, parcel, tract, etc.
- Preliminary Site Plan (elements can be incorporated within Drainage Control Plan).\* The required elements for a Preliminary Site Plan are the same as for a Site Plan.
- Preliminary On-site Stormwater Management Documentation.\*
- Preliminary Drainage Report or Flow Control and Water Quality Documentation.\*

\*All submittals for Preliminary Drainage Review must be identified as “Preliminary.” Preliminary Drainage Review approval does not permit construction. Standard or Comprehensive Drainage Review approval will be required for all associated construction permits.

Note: Refer to *Appendix B* for instances when some of the listed items may be deferred to the construction permits rather than being submitted with the MUP application.

### **2.8.2.      *Standard Drainage Review***

Standard Drainage Review typically applies to projects that include:

- 750 square feet or more but less than 10,000 square feet of land disturbing activity;
- Less than 5,000 square feet of new plus replaced hard surface .
- An approved off-site point of discharge,
- No new outfalls to receiving waters.

For a project with no off-site discharge point as determined by the Director (refer to *Volume 3, Section 4.3.2*) or that includes installation of a new receiving water outfall, the drainage control plan must be prepared by a licensed engineer (SMC 22.807.020.B.2.b).

Refer to SMC, Subsection 22.807.020.A for other scenarios when Standard Drainage Review applies.

### Stormwater Code Language

SMC, 22.807.020.A — *Thresholds for drainage control review. Drainage control review and approval as described in subsection 22.807.020.B is required for any of the following:*

2. *Standard drainage review and approval is required for the following:*
  - a. *Applications other than those listed in subsection 22.807.020.A.1 that include any land disturbing activity encompassing an area of 5,000 square feet or more, including demolition permits;*
  - b. *Applications for a building permit or other construction permit that authorizes the construction or installation of 750 square feet or more of new plus replaced hard surface;*
  - c. *Applications for which a grading permit or approval is required pursuant to Chapter 22.170 [Grading Code];*
  - d. *Applications for street use permits for the cumulative addition of 750 square feet or more of new plus replaced hard surface and land disturbing activity;*
  - e. *City public works projects or construction contracts, including contracts for day labor and other public works purchasing agreements, for the cumulative addition of 750 square feet or more of new plus replaced hard surface and/or land disturbing activity to the site, except for work performed for the operation and maintenance of park lands under the control or jurisdiction of the Department of Parks and Recreation;*
  - f. *Applications for approvals and contracts that include any new or replaced hard surface or any land disturbing activity on a site deemed a potentially hazardous location, as specified in Section 22.800.050 (Potentially Hazardous Locations);*
  - g. *Applications for approvals that include any new hard surface in a Category I peat settlement-prone area delineated pursuant to Section 25.09.012 [Designations and Definitions of Environmentally Critical Areas];*
  - h. *Whenever an exception to a requirement set forth in this Subtitle VIII or in a rule promulgated under this Subtitle VIII is desired, whether or not review and approval would otherwise be required, including, but not limited to, alteration of natural drainage patterns or the obstruction of watercourses;*
  - i. *Whenever roadway project infeasibility pursuant to subsection 22.805.060.E is applied, whether or not review and approval would otherwise be required; or*
  - j. *Applications for approvals for activities or projects for:*
    - 1) *Fueling at dedicated stations, for new or substantially altered fueling stations.*
    - 2) *In-water and over-water fueling.*
    - 3) *Maintenance and repair of vehicles and equipment.*
    - 4) *Concrete and asphalt mixing and production.*
    - 5) *Recycling, wrecking yard, and scrap yard operations.*
    - 6) *Storage of liquids in aboveground tanks.*
    - 7) *Other projects that the Director determines pose a hazard to public health, safety, or welfare; endanger any property; adversely affect the safety and operation of City right-of-way, utilities, or other property owned or maintained by the City; or adversely affect the functions and values of an environmentally critical area or buffer.*

The submittals required for Standard Drainage Review must include the following at a minimum:

- Construction Stormwater Control and Soil Management Plan (refer to *Volume 2 and Volume 3, Section 5.1*) including a dewatering plan if groundwater dewatering (e.g. trench dewatering, wellpoint dewatering, mass excavation dewatering) will occur.
- Standard Drainage Control Plan:
  - Site and drainage control summary.
  - Existing drainage infrastructure.
  - Location of drainage discharge from the site.
  - Drainage collection and conveyance measures (e.g., inlets, catch basins, maintenance holes, downspouts, drain lines, subgrade drainage, pumps, etc.).
  - Identification of uphill run-on areas (i.e., areas that may contribute stormwater runoff onto the project site).
  - On-site Stormwater Management BMPs and hard surface identification (refer to On-site Stormwater Management documentation below).
  - Flow Control BMPs.
  - Water Quality Treatment BMPs.
  - Source Control BMPs.
  - Identification of which of the following standards are met with each BMP using the following abbreviations:
    - On-site Stormwater Management (OSM)
    - Flow Control (FC)
    - Water Quality (WQ)
    - Source Control (SC)
  - Maintenance instructions.
- Site Plan (elements can be incorporated within Drainage Control Plan)
  - Address of project and permit number.
  - Limits of disturbance, including all clearing, grading, and other land-disturbing activity.
  - Creeks, streams, shorelines, and any other Environmentally Critical Areas (ECAs) or their buffers.
  - Areas to be protected.
  - Names, widths, and improvement types of adjacent streets and alleys.
  - Type, location, and dimension of curbs, sidewalks, and street trees.
  - All other trees at least 6 inches in diameter or larger measured 4.5 feet above the ground.
  - Location of all existing and proposed driveways, parking areas, and other paved areas and hard surfaces.

- Size and shape of current and proposed buildings (including overhangs) and all other structures (retaining walls, etc.).
- Entrances.
- Building identifiers (for sites with more than one building).
- Existing grades, ground elevations, or both including contours; flow lines, slope arrows, or both; tops and bottoms of slopes; and retaining walls, etc.
- Proposed grades, ground elevations, or both including contours; spot elevations; flow lines, slope arrows, or both; tops and bottoms of slopes; and retaining walls, etc. with enough information to identify drainage patterns.
- Existing and proposed retaining walls.
- Existing and proposed below grade and above grade utilities and infrastructure.
- Property line dimensions.
- Existing and proposed easements.
- Setbacks.
- On-site Stormwater Management Documentation:
  - Hard surface identification (e.g., roofs, driveways, sidewalks, patios).
  - On-site Stormwater Management BMP selection and sizing (refer to *Volume 3, Section 3.3*, and *Chapter 5*).
  - Documentation of On-site Stormwater Management BMPs determined to be infeasible (refer to *Appendix C*).
  - Where dispersion is not feasible, documentation demonstrating infeasibility (refer to *Volume 3, Section 3.1*).
  - Where infiltration is not feasible, documentation demonstrating infeasibility (refer to *Volume 3, Section 3.2*).
  - Subsurface investigation, infiltration test results, or groundwater analysis, as required per *Volume 3, Sections 3.2 and 5.4.1*, and *Appendix D*.
- Flow control documentation, if triggered. Required documentation may include:
  - Flow control BMP selection and sizing (refer to *Volume 3, Section 3.4*, and *Chapter 5*).
  - Details of any flow control device assembly, including orifice and weir sizing and elevations, if used.
  - Modeling documentation (refer to *Appendix F*).
  - Subsurface investigation, infiltration test results, or groundwater analysis as required per *Volume 3, Sections 3.2 and 5.4.1*, and *Appendix D*.
- Memorandum of Drainage Control for projects not located in the right-of-way, including at a minimum (SMC, Subsection 22.807.020.B.1.d):
  - The legal description of the site.
  - A summary of the terms and limitations of the drainage control plan.

- Identify all stormwater BMPs specific to the project (e.g., catch basins, permeable pavement surfaces, detention pipes, biofiltration swales, wash pads).
- An agreement to inform future purchasers, successors, or assignees of the existence, limitations, and inspection and maintenance requirements of the stormwater BMPs.
- Landscape management plan (if applicable).
- The side sewer permit number, date, and name.
- Permission for the City to enter the property for inspection, monitoring, correction, and abatement purposes.
- Acknowledgment by the owner(s) that the City is not responsible for the adequacy or performance of the drainage control plan, and a waiver of any and all claims against the City for any harm, loss, or damage related to the plan or to drainage or erosion on the property, except for claims arising from the City's sole negligence.
- The owner(s)' signatures acknowledged by a notary public.
- Operations and maintenance (O&M) plan for stormwater BMPs or include reference to the O&M requirements in *Appendix G* on the Drainage Control Plan.

### 2.8.3. *Comprehensive Drainage Review*

#### Stormwater Code Language

SMC, 22.807.020.A — *Thresholds for drainage control review. Drainage control review and approval as described in subsection 22.807.020.B is required for any of the following:*

3. *Comprehensive drainage review and approval is required for applications other than those listed in subsection 22.807.020.A.1 that include:*
  - a. *5,000 square feet or more of new plus replaced hard surface;*
  - b. *10,000 square feet or more of land disturbing activity;*
  - c. *A project that has no available off-site point of discharge for stormwater as determined by the Director;*
  - d. *An infiltration facility that is designed to fully infiltrate all stormwater runoff directed to it;*
  - e. *An installation of a new outfall to a receiving water; or*
  - f. *Demolition of a building with a roof area of 5,000 square feet or greater, even if the existing building slab remains.*

A Comprehensive Drainage Plan must be prepared by an engineer licensed in the State of Washington.

In addition to the requirements of the Standard Drainage Review, the following information is required for the Comprehensive Drainage Review:

- Comprehensive Drainage Control Plan consisting of:
  - A Comprehensive Drainage Control Construction Drawing including all elements of a Standard Drainage Control Plan.
  - A Comprehensive Construction Stormwater Control and Soil Management Plan narrative, supporting calculations, and supporting documents, including the Checklist to Select Large Project Construction BMPs (refer to Table 1b in *Volume 2, Chapter 3*. This may be prepared by a qualified professional other than an engineer (e.g., landscape architect), but when the plan includes engineering calculations, it must be stamped and signed by an engineer licensed in the State of Washington.
  - A Comprehensive Drainage Control Report, including but not limited to (refer to *Appendix B* for other required elements and recommended format):
    - A narrative detailing the proposed project, summary of minimum requirements, and proposed stormwater management.
    - Narrative of existing conditions, including drainage basins, existing surface types, soil conditions, groundwater conditions, Environmentally Critical Areas (ECAs), and known contamination.
    - Dispersion feasibility analysis and documentation (refer to *Volume 3, Section 3.1*).
    - Infiltration feasibility analysis and documentation (refer to *Volume 3, Section 3.2*).

- On-site Stormwater Management Documentation and supporting calculations (if triggered). Refer to *Section 2.8.2*.
  - Flow control documentation and supporting calculations (if triggered). Refer to *Section 2.8.2*.
  - Water quality documentation and supporting calculations (if triggered).
  - Landscape management plan (if applicable). Refer to *Appendix I*.
  - Source control documentation and calculations (if required).
  - Drainage basin maps.
  - Inspection and O&M requirements and schedule for stormwater BMPs and for any applicable landscape management plans.
- Refer to *Volume 3, Section 4.3.2* for specific requirements for projects with no off-site point of discharge. In some cases, projects with less than 1,500 square feet of new plus replaced hard surface will not require preparation by a licensed engineer.

#### **2.8.4. Additional Documentation**

Additional information may be required by the Director based on project specifics (e.g., infeasibility evaluation, existing conditions) to allow adequate evaluation of a project for compliance with the requirements and purpose of the Stormwater Code and other laws and regulations.

Such information includes, but is not limited to:

- Soils analysis
- Geotechnical report
- Survey of existing native vegetation cover (SMC, Section 25.11.050)
- Topographic or boundary survey (SMC, Section 25.09.330)
- Environmental assessment for potentially contaminated sites.
- Special Inspections for contaminated sites. Sites with contaminated soils or groundwater may require special inspections by a third-party during construction at the developer's/owner's expense to ensure that contaminated stormwater or groundwater does not leave the site without treatment or is disposed at a facility that is permitted and authorized to accept the type of discharges present, as determined by the Director.
- Downstream analysis
- Upstream analysis
- Basin analysis
- Landscape management plan (See *Appendix I* for submittal requirements)
- Closed contour analysis
- Adjustment requests substantiating the requirements of SMC, Subsection 22.800.040.B.
- Exception requests meeting the requirements of SMC, Subsection 22.800.040.C.



## CHAPTER 3 – Minimum Requirements for All Projects

All projects are required to comply with the minimum requirements listed in SMC, Chapter 22.805, even when drainage control review is not required. The specifics of the minimum requirements applicable to all projects per SMC, Section 22.805.020 are summarized in the following subsections.

Note that this section summarizes but does not replace or alter Stormwater Code requirements.

### 3.1. Maintaining Natural Drainage Patterns

<b>Stormwater Code Language</b>
SMC, 22.805.020.A – <i>Minimum requirements for maintaining natural drainage patterns. For all projects, natural drainage patterns shall be maintained and discharges shall occur at the natural location to the maximum extent feasible and consistent with subsection 22.805.020.B. Drainage water discharged from the site shall not cause a significant adverse impact to receiving waters or down-gradient properties. Drainage water retained or infiltrated on the site shall not cause significant adverse impact to up-gradient or down-gradient properties.</i>
<b>References</b>
<ul style="list-style-type: none"> <li>• Volume 1, Section 3.2 (SMC, Section 22.805.020.B) – Minimum Requirements for Discharge Point</li> <li>• Public Drainage System Requirements Director's Rule DWW-210</li> </ul>

Discharges from the project site must not cause a significant adverse impact to downstream receiving waters and down-gradient properties or systems. All concentrated discharge locations (i.e., discharges from pipe systems, culverts, and ditches) must address energy dissipation.

### 3.2. Discharge Point

#### 3.2.1. *Approved Point of Discharge*

All projects must convey stormwater flow to an approved point of discharge and include overflows for all stormwater BMPs.

<b>Stormwater Code Language</b>
SMC, 22.805.020.B – <i>Minimum requirements for discharge point. The discharge point for drainage water from each site shall be selected using criteria that shall include, but not be limited to, preservation of natural drainage patterns and whether the capacity of the drainage system is adequate for the flow rate and volume. For those projects meeting the drainage review threshold, the proposed discharge point shall be identified in the drainage control plan required by this subtitle, for review and approval or disapproval by the Director.</i>
<b>References</b>
<ul style="list-style-type: none"> <li>• Public Drainage System Requirements Director's Rule DWW-210</li> </ul>

A project’s approved point of discharge as determined by the Director, in order of priority, includes:

1. Receiving waters
2. Piped public drainage system (also known as Pipe Storm Drain [PSD])
3. Ditch and culvert system
4. Public combined sewer system
5. Infiltration on site

Extension of the **piped** public drainage system may be required even if a ditch and culvert system or a public combined sewer abuts a project (refer to *Section 3.12* and the Public Drainage System Requirements Director’s Rule (SPU Director’s Rule DWW210)).

Note: Stormwater and groundwater must not be conveyed to or enter a sanitary sewer (SMC, Section 21.16.220), including those systems that were permitted as a formerly combined system.

Refer to SPU’s Water & Sewer Map for “Permitted Use” in determining if a system is classified as a public sanitary sewer: <https://www.seattle.gov/utilities/construction-resources/water-and-sewer-map>.

### **3.2.2. Conveyance Systems to Point of Discharge**

The types of conveyance systems to the approved point of discharge, in order of priority, include:

1. Direct pipe connections
2. Ditch (also known as conveyance swale) and culvert system
3. Gutter or street flow line
4. Surface dispersal

## **3.3. Flood-prone Areas**

<b>Stormwater Code Language</b>
<p>SMC, 22.805.020.C – <i>Minimum requirements for flood-prone areas. On sites within flood-prone areas, responsible parties are required to employ procedures to minimize the potential for flooding on the site and to minimize the potential for the project to increase the risk of floods on adjacent or nearby properties. Flood control measures shall include those set forth in other titles of the Seattle Municipal Code and rules promulgated thereunder, including, but not limited to, Chapter 23.60A (Seattle Shoreline Master Program Regulations), Chapter 25.06 (Floodplain Development), and Chapter 25.09 (Regulations for Environmentally Critical Areas).</i></p>

## 3.4. Construction Site Stormwater Pollution Prevention Control

The Construction Stormwater Control and Soil Management Plan applies best management practices (BMPs) that fall within the following 19 elements of water quality, air quality, and downstream resource protection and are required by the Stormwater Code (SMC, Subsection 22.805.020.D).

<b>Stormwater Code Language</b>
<p>Excerpt from SMC, 22.805.020.D – Minimum Requirements for Construction Stormwater Pollution Prevention Plan. Temporary and permanent construction controls shall be used to accomplish [the 19 construction site stormwater pollution prevention control requirements outlined in SMC 22.805.020.D and Volume 2, Construction Stormwater Control]. All projects are required to meet each of the elements below or document why an element is not applicable. Additional controls may be required by the Director when minimum controls are not sufficient to prevent erosion or transport of sediment or other pollutants from the site.</p> <ol style="list-style-type: none"> <li>1. Mark Clearing Limits and Environmentally Critical Areas</li> <li>2. Retain Top Layer</li> <li>3. Establish Construction Access</li> <li>4. Protect Downstream Properties and Receiving Waters</li> <li>5. Prevent Erosion and Sediment Transport from the Site</li> <li>6. Prevent Erosion and Sediment Transport from the Site by Vehicles</li> <li>7. Stabilize Soils</li> <li>8. Protect Slopes</li> <li>9. Protect Storm Drains</li> <li>10. Stabilize Channels and Outlets</li> <li>11. Control Pollutants</li> <li>12. Control Dewatering</li> <li>13. Maintain BMPs</li> <li>14. Inspect BMPs</li> <li>15. Execute Construction Stormwater Control and Soil Management Plan</li> <li>16. Minimize Open Trenches</li> <li>17. Phase the Project</li> <li>18. Install Flow Control and Water Quality Facilities</li> <li>19. Protect Stormwater BMPs</li> </ol>

Refer to the Stormwater Code or *Volume 2, Chapter 3* for full code text.

These 19 elements cover protection strategies, including:

- Limiting project site impacts.
- Protecting the public drainage system, combined and sanitary sewers, and downstream receiving waters.
- Preventing erosion and sedimentation.
- Managing activities and sources.

Project designers must review the applicable elements in Volume 2, Chapter 2 and ensure the specific requirements under each of the 19 elements are fully addressed by the project site stormwater pollution prevention controls.

Refer to *Volume 1, Section 2.8.3* (Comprehensive Drainage Plan) to determine when a Construction Stormwater Control Plan must be prepared by an engineer licensed in the State of Washington.

### 3.5. Protect Wetlands

<b>Stormwater Code Language</b>
SMC, 22.805.020.E – <i>Protect wetlands. All projects discharging into a wetland or its buffer, either directly or indirectly through a drainage system, shall prevent impacts to wetlands that would result in a net loss of functions or values.</i>
SMC, 22.801.240 – <i>"Wetland function" means the physical, biological, chemical, and geologic interactions among different components of the environment that occur within a wetland. Wetland functions can be grouped into three categories: functions that improve water quality; functions that change the water regime in a watershed, such as flood storage; and functions that provide habitat for plants and animals.</i>
SMC, 22.801.240 – <i>"Wetland values" means wetland processes, characteristics, or attributes that are considered to benefit society.</i>

All wetlands (Categories I, II, III, and IV) must receive the following general protections:

1. Comply with regulations issued under federal and state laws that regulate the discharge of pollutants to surface waters, including the Construction Stormwater General NPDES Permit.
2. Comply with Seattle ECA Code SMC 25.09 - Regulations for Environmentally Critical Areas. Refer to SMC 25.09.160.C for allowed and prohibited activities in wetland and wetland buffers. Development is prohibited and includes but is not limited to grading, filling, draining, or any alteration to the functions and values of the wetland (including but not limited to negative impacts on trees and vegetation, habitat, flood control, and water quality unless an ECA exception is granted or as provided in the ECA Code. Note: installation of drainage systems or other utilities is considered "development," which is prohibited in wetlands and wetland buffers.
3. Protect the wetland buffer as required by all local and state regulations.

4. Retain areas of native vegetation connecting the wetland and its buffer with nearby wetlands and other abutting areas of native vegetation, if possible.
5. Consider installing wetland protection-related signage.
6. Any stormwater management practices, such as On-site Stormwater Management, Water Quality Treatment, and Flow Control BMP implementation or construction of stormwater conveyance facilities (e.g., piped, ditches, culverts, etc.), must be done outside of the wetland buffer boundary unless an ECA exception is granted or as provided in the ECA Code.
7. Discharge from a BMP or project site must be dispersed using a method to spread out the flow before entering the wetland buffer. Preferably use Dispersion BMP from *Volume 3, Section 5.3*. If that is not feasible, then use a level spreader sized for permanent discharges.
8. Consider fences to restrict human access without interfering with wildlife movement.

In addition, Flow Control, per *Section 5.3.1 - Wetland Protection Standards*, is required for certain Parcel-based and Roadway Projects as identified in *Section 4.1.3.1 and 4.3.3.1*.

### 3.6. Protect Streams and Creeks

#### Stormwater Code Language

SMC, 22.805.020.F – *Protect Streams and creeks. All projects, including projects discharging directly to a stream or creek, or to a drainage system that discharges to a stream or creek, shall maintain the water quality in any affected stream or creek by selecting, designing, installing, and maintaining temporary and permanent controls.*

### 3.7. Protect Shorelines

#### Stormwater Code Language

SMC, 22.805.020.G – *Protect shorelines. All projects discharging directly or indirectly through a drainage system into the shoreline district as defined in Chapter 23.60A (Seattle Shoreline Master Program Regulations) shall prevent impacts to water quality and stormwater quantity that would result in a net loss of shoreline ecological functions as defined in WAC 173-26-020(13).*

### 3.8. Ensure Sufficient Capacity

#### Stormwater Code Language

SMC, 22.805.020.H – *Ensure sufficient capacity. All projects with 5,000 square feet or more of new plus replaced hard surface or one acre of land disturbing activity, all projects with an excavation depth of 12 feet or more below the existing grade, all projects with an excavation depth of less than 12 feet located in an area expected to have shallow groundwater depths, and all projects that alter the drainage pattern from 5,000 square feet or more of an existing, new, or replaced hard surface or 3/4 of an acre or more of a pervious surface from a site to a downstream system not previously connected via discrete conveyance shall ensure that sufficient capacity exists in the drainage system and public combined sewer to carry existing and anticipated loads, including any flows from dewatering activities. Capacity analysis shall extend to at least 1/4-mile from the discharge point of the site. Sites at which there is insufficient capacity may be required to install a flow control facility or improve the drainage system or public combined sewer to accommodate flow from the site. Unless approved otherwise by the Director as necessary to meet the purposes of this subtitle:*

1. *Capacity analysis for discharges to the drainage system shall be based on peak flows with a 4 percent annual probability (25-year recurrence interval); and*
2. *Capacity analysis for discharges to the public combined sewer shall be based on peak flows with a 20 percent annual probability (5-year recurrence interval).*

#### References

- Volume 3, Section 4.3 – Conveyance and Overflow General Design Requirements
- Appendix F – Hydrologic Analysis and Design
- SMC, Section 22.805.020.N – Public Drainage System Requirements
- Public Drainage System Requirements Director’s Rule DWW-210

### 3.9. Install Source Control BMPs

<b>Stormwater Code Language</b>
<p>SMC, 22.805.020.I – <i>Install source control BMPs. Source control BMPs shall be installed for discharges, properties, and by businesses and public entities for specific pollution-generating activities as specified in Chapter 22.803 and in the joint SPU/SDCI Directors' Rule titled "Seattle Stormwater Manual" at "Volume 4—Source Control," to the extent necessary to prevent prohibited discharges as described in Section 22.802.020 [Prohibited Discharges] and to prevent contaminants from coming in contact with drainage water. This requirement applies to the pollution-generating activities that are stationary or occur in one primary location and to the portion of the site being developed. Examples of installed source controls include, but are not limited to, the following:</i></p> <ol style="list-style-type: none"> <li>1. <i>A roof, awning, or cover erected over the pollution-generating activity area;</i></li> <li>2. <i>Ground surface treatment in the pollution-generating activity area to prevent interaction with, or breakdown of, materials used in conjunction with the pollution-generating activity;</i></li> <li>3. <i>Containment of drainage from the pollution-generating activity to a closed sump or tank. Contents of such a sump or tank must be pumped or hauled by a waste handler, or treated prior to discharge to a public drainage system;</i></li> <li>4. <i>Construct a berm or dike to enclose or contain the pollution-generating activities;</i></li> <li>5. <i>Direct drainage from containment area of pollution-generating activity to a closed sump or tank for settling and appropriate disposal, or treat prior to discharging to a public drainage system;</i></li> <li>6. <i>Pave, treat, or cover the containment area of pollution-generating activities with materials that will not interact with or break down in the presence of other materials used in conjunction with the pollution-generating activity; and</i></li> <li>7. <i>Prevent precipitation from flowing or being blown onto containment areas of pollution-generating activities.</i></li> </ol>

### 3.10. Do Not Obstruct Watercourses

<b>Stormwater Code Language</b>
<p>SMC, 22.805.020.J – <i>Do not obstruct watercourses. Watercourses shall not be obstructed.</i></p>
<p>SMC, 22.808.010.A.1.d – <i>Obstruction of watercourse or public drainage system. It is a violation to obstruct a watercourse or public drainage system without authorization or approval by the Director.</i></p>

### 3.11. Comply with Side Sewer Code

A side sewer permit is required for any repair, replacement, or alteration of the sewer or drainage system. Any change to the point of discharge must be approved. A change of use that introduces contaminants or process water to the drainage system, public combined sewer, or public sanitary sewer must also be approved and may require pretreatment. For information on side sewer permits, contact the SPU Side Sewer Program at (206) 684-5362 or sidesewerinfo@seattle.gov. For information on King County discharge requirements, contact the Industrial Waste Program at (206) 477-5300 or Info.KCIW@kingcounty.gov.

### Stormwater Code Language

SMC, 22.805.020.K – *Comply with Side Sewer Code*

1. *All privately owned and operated drainage control facilities or systems, whether or not they discharge to a public drainage system or public combined sewer, shall be considered side sewers and subject to Chapter 21.16 (Side Sewer Code), SPU Director's Rules promulgated under Title 21, and the design and installation specifications and permit requirements of SPU for side sewer and drainage systems.*
2. *Side sewer permits and inspections shall be required for constructing, capping, altering, or repairing privately owned and operated drainage systems as provided for in Chapter 21.16. When the work is ready for inspection, the permittee shall notify the Director of SPU. If the work is not constructed according to the plans approved under this Subtitle VIII, Chapter 21.16, the SPU Director's Rules promulgated under Title 21, and SPU design and installation specifications, then the Director may issue a stop work order under Chapter 22.808 [Stormwater Code Enforcement] and require modifications as provided for in this Subtitle VIII and Chapter 21.16.*

## 3.12. Extension of Public Drainage System

### 3.12.1. *Projects Not Constructed in the Right-of-Way*

#### Stormwater Code Language

SMC, 22.805.020.L – *Extension of the public drainage system for projects not constructed in the public right-of-way. For projects not constructed in the public right-of-way, extension of the piped public drainage system across the full extent of the parcel boundary in the abutting public place shall be required for any of the following:*

1. *All projects where the Director has determined an extension is required considering, but not limited to, the following attributes of the project:*
  - a. *Poses a hazard to public health, safety, or welfare;*
  - b. *Endangers any property;*
  - c. *Adversely affects the safety and operation of public right-of-way, utilities, or other property owned or maintained by the City;*
  - d. *Adversely affects the functions and values of an environmentally critical area or buffer;*
  - e. *Adversely affects an area with known erosion or flooding problems; or*
  - f. *Adversely affects receiving waters, any properties, or right-of-way.*
2. *All projects with 5,000 square feet or more of new plus replaced hard surface, unless:*
  - a. *The piped public drainage system is already accessible within an abutting public place to each existing, proposed, or adjusted parcel; or*
  - b. *The project is otherwise not required to extend by rules promulgated by the Director.*

#### References

- Public Drainage System Requirements Director's Rule DWW-210

### 3.12.2. *Projects Constructed in the Right-of-Way*

<b>Stormwater Code Language</b>
<p>SMC, 22.805.020.M – <i>Extension of the public drainage system for projects constructed in the public right-of-way. For projects constructed in the public right-of-way, extension of the piped public drainage system across the full extent of the site shall be required for any of the following:</i></p> <ol style="list-style-type: none"> <li>1. <i>All projects where the Director has determined an extension is required considering, but not limited to, the following attributes of the project:</i> <ol style="list-style-type: none"> <li>a. <i>Poses a hazard to public health, safety, or welfare;</i></li> <li>b. <i>Endangers any property;</i></li> <li>c. <i>Adversely affects the safety and operation of City right-of-way, utilities, or other property owned or maintained by the City;</i></li> <li>d. <i>Adversely affects the functions and values of an environmentally critical area or buffer;</i></li> <li>e. <i>Adversely affects an area with known erosion or flooding problems; or</i></li> <li>f. <i>Adversely affects receiving waters, any properties, or right-of-way.</i></li> </ol> </li> <li>2. <i>The project's total new plus replaced hard surface is 50 percent or more of the existing hard surfaces within the project limits. The project limits are defined by the length of the project and the width of the right-of-way. If a project encompasses more than one intersection, the project limits are further defined by one intersection to the other and blocks may vary in length, unless:</i> <ol style="list-style-type: none"> <li>g. <i>The piped public drainage system is already accessible within the site across the full extent of the site; or</i></li> <li>h. <i>The project is otherwise not required to extend by rules promulgated by the Director.</i></li> </ol> </li> </ol>
<b>References</b>
<ul style="list-style-type: none"> <li>• Public Drainage System Requirements Director's Rule DWW-210</li> </ul>

### 3.13. **Public Drainage System Requirements**

<b>Stormwater Code Language</b>
<p>SMC, 22.805.020.N – <i>Public drainage system requirements. Public drainage systems shall be constructed in accordance with the City's Standard Plans and Specifications, SPU's Design Standards and Guidelines, and as specified in rules promulgated by the Director of SPU.</i></p>
<b>References</b>
<ul style="list-style-type: none"> <li>• City of Standard Specifications for Road, Bridge, and Municipal Construction</li> <li>• City of Seattle Standard Plans for Municipal Construction</li> <li>• SPU Design Standards and Guidelines</li> <li>• Public Drainage System Requirements Director's Rule DWW-210</li> </ul>

### 3.14. Maintenance and Inspection

Projects that construct on-site stormwater management, flow control, and water quality treatment BMPs must comply with the maintenance and inspection requirements specified in SMC, Section 22.807.090. Refer to *Appendix G - Stormwater Control Operations and Maintenance Requirements* and *Appendix I - Landscape Management Plans and Integrated Pest Management Plans* for additional maintenance and inspection requirement information.

**Stormwater Code Language****SMC, 22.807.090 – Maintenance and inspection**

- A. Responsibility for Maintenance and Inspection. The owner and other responsible parties shall maintain drainage control facilities, source controls, and other facilities and implement landscape management plans required by this subtitle and by rules adopted hereunder to keep these facilities in continuous working order. The owner and other responsible parties shall inspect permanent drainage control facilities, temporary drainage control facilities, and other temporary best management practices or facilities on a schedule consistent with this subtitle and sufficient for the facilities to function at design capacity. The Director may require the responsible party to conduct more frequent inspections and/or maintenance when necessary to ensure functioning at design capacity. The owner(s) shall inform future purchasers and other successors and assignees to the property of the existence of the drainage control facilities and the elements of the drainage control plan, the limitations of the drainage control facilities, and the requirements for continued inspection and maintenance of the drainage control facilities and for implementation of a landscape management plan, if applicable.*
- B. Inspection by City. The Director of SPU may establish inspection programs to evaluate and, when required, enforce compliance with the requirements of this subtitle and accomplishment of its purposes. Inspection programs may be established on any reasonable basis, including, but not limited to: routine inspections; random inspections; inspections based upon complaints or other notice of possible violations; inspection of drainage basins or areas identified as higher than typical sources of sediment or other contaminants or pollutants; inspections of businesses or industries of a type associated with higher than usual discharges of contaminants or pollutants or with discharges of a type more likely than the typical discharge to cause violations of state or federal water or sediment quality standards or the City's NPDES stormwater permit; and joint inspections with other agencies inspecting under environmental or safety laws. Inspections may include, but are not limited to: reviewing maintenance and repair records; sampling discharges, surface water, groundwater, and material or water in drainage control facilities; and evaluating the condition of drainage control facilities and other best management practices.*
- C. Entry for inspection and abatement purposes*
- 1. New installations and connections. When any new drainage control facility is installed on private property, and when any new connection is made between private property and a public drainage system, sanitary sewer or combined sewer, the property owner shall grant, pursuant to subsection 22.807.020.B.1.c (Memorandum of drainage control), the City the right to enter the property at reasonable times and in a reasonable manner pursuant to an inspection program established pursuant to subsection 22.807.090.B, and to enter the property when the City has a reasonable basis to believe that a violation of this subtitle is occurring or has occurred, and to enter when necessary for abatement of a public nuisance or correction of a violation of this subtitle.*
  - 2. Existing real property and discharges. Owners of property with existing discharges or land uses subject to this subtitle who are not installing a new drainage control facility or making a new connection between private property and a public drainage system, sanitary sewer, or combined sewer shall have the option to execute a permission form for the purposes described above when provided with the form by the Director of SPU.*



## CHAPTER 4 – Minimum Requirements Based on Project Type

In addition to the minimum requirements for all projects presented in *Chapter 3*, additional requirements apply based on project type and are summarized in this chapter. Project types are defined in *Chapter 2, Step 2*.

Flow charts are included in the parcel-based and roadway project sections (*Sections 4.1 and 4.3*) to summarize the key minimum requirements.

The key project type minimum requirements include:

- Soil Amendment
- On-site Stormwater Management
- Flow Control
  - Wetland Protection Standard
  - Pre-developed Forested Standard
  - Pre-developed Pasture Standard
  - Peak Control Standard
- Water Quality Treatment
  - Basic Treatment
  - Oil Treatment
  - Phosphorus Treatment
  - Metals Treatment (previously known as Enhanced Treatment)

The standards are described in more detail in *Chapter 5*. For each project type, the minimum requirements are a function of the following factors (refer to *Chapter 2*):

- The receiving water, type of downstream conveyance, or both.
- The amount of new plus replaced hard surface (Note: permeable pavement, vegetated roof systems, and areas with underdrains count toward determining this threshold.).
- The amount of converted native vegetation.
- The amount of new plus replaced pollution-generating hard surface (PGHS).
- The amount of new plus replaced pollution-generating pervious surface (PGPS).

In addition, certain locations in the City may be subject to additional or modified requirements based on additional Director's Rules, Policies, other Codes (e.g., ECA Code), or past agreements. For example, such areas include parts of the SODO and Downtown waterfront areas, the Yesler Terrace Development, the High Point Re-development, Peat Settlement-prone ECAs. Refer to Step 7 (*Section 2.7*) for more information.

## 4.1. Parcel-based Projects

Parcel-based projects must meet the minimum requirements for soil amendment (SMC, Subsection 22.805.050.A), on-site stormwater management (SMC, Section 22.805.070), flow control (SMC, Section 22.805.080), and water quality treatment (SMC, Section 22.805.090) when applicable. Key minimum requirements for parcel-based projects are summarized in Figures 4.1a through 4.1c. Refer to *Volume 1, Section 5.1. Soil Amendment* for more information.

### 4.1.1. Soil Amendment

<b>Stormwater Code Language</b>
<p>SMC, 22.805.050 - Minimum requirements for parcel-based projects</p> <p><i>A — Soil amendment. Retain and protect undisturbed soil in areas not being developed, and prior to completion of the project, amend all new, replaced, and disturbed topsoil (including construction lay-down areas) with organic matter to the extent required by and in compliance with the rules promulgated by the Director.</i></p>
<b>References</b>
<ul style="list-style-type: none"> <li>• Volume 1, Section 2.2.1 – Parcel-based Project</li> <li>• Volume 1, Section 5.1 – Soil Amendment</li> <li>• Volume 3, Section 5.1 – Soil Amendment BMP</li> </ul>

### 4.1.2. On-site Stormwater Management

<b>Stormwater Code Language</b>
<p>SMC, 22.805.050 - Minimum requirements for parcel-based projects</p> <p><i>B — On-site stormwater management. Parcel-based projects shall meet the minimum requirements for on-site stormwater management contained in Section 22.805.070, to the extent allowed by law, if:</i></p> <ol style="list-style-type: none"> <li><i>1. For a project on a lot most recently created, adjusted, altered, or otherwise amended by a plat or other lawful document recorded with the King County Recorder on or after January 1, 2016, and where that document either created the lot or altered the size of the lot, either the total new plus replaced hard surface is 750 square feet or more or land disturbing activity is 7,000 square feet or more; or</i></li> <li><i>2. For any other project, either the total new plus replaced hard surface is 1,500 square feet or more or the land disturbing activity is 7,000 square feet or more.</i></li> </ol>
<b>References</b>
<ul style="list-style-type: none"> <li>• Volume 1, Section 2.2.1 – Parcel-based Project</li> <li>• Volume 1, Section 5.2 (SMC, Section 22.805.070) – On-site Stormwater Management</li> <li>• Volume 3, Section 3.3 – BMP Selection for On-site Stormwater Management</li> </ul>

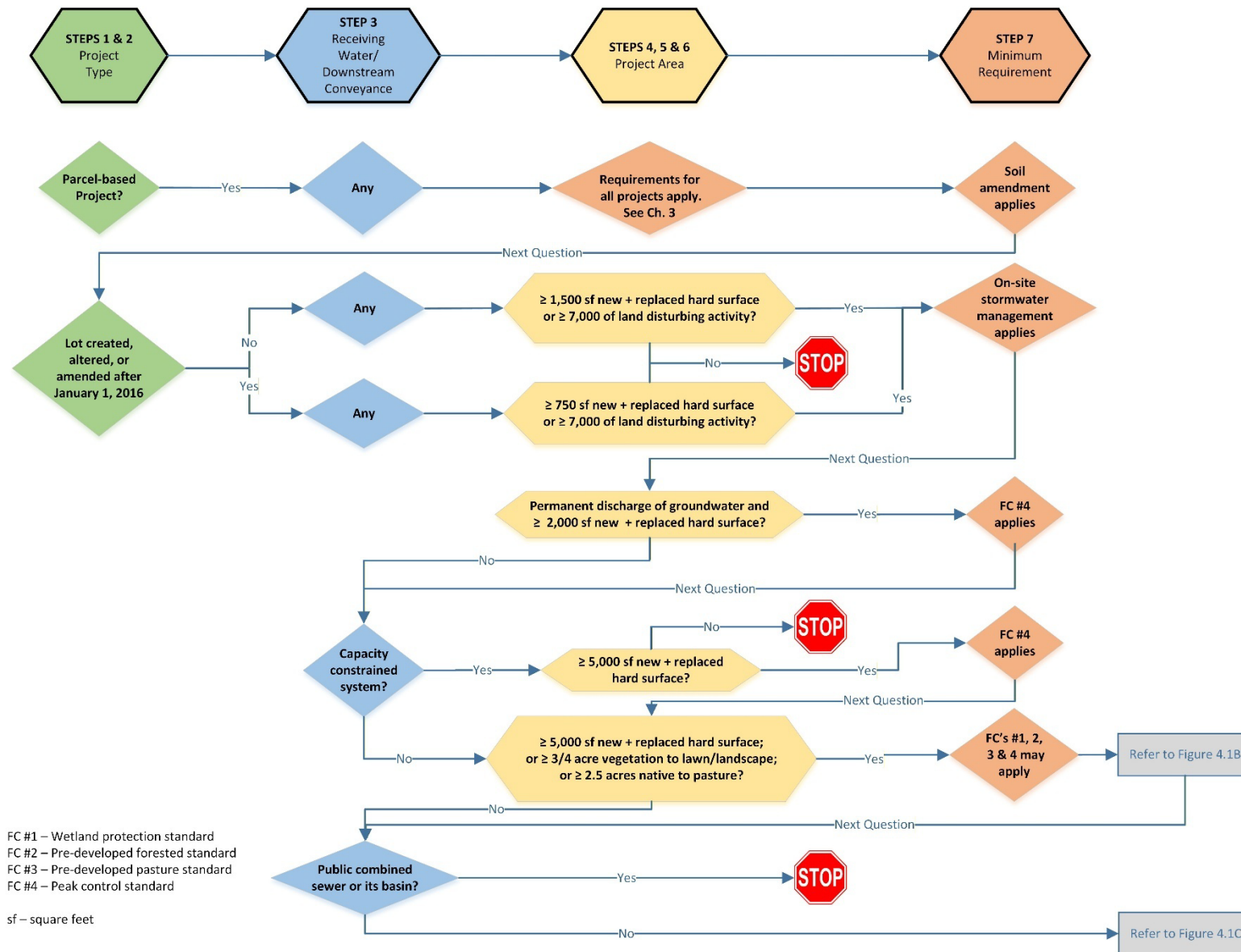


Figure 4.1A. Project Minimum Requirements for Parcel-based Projects.

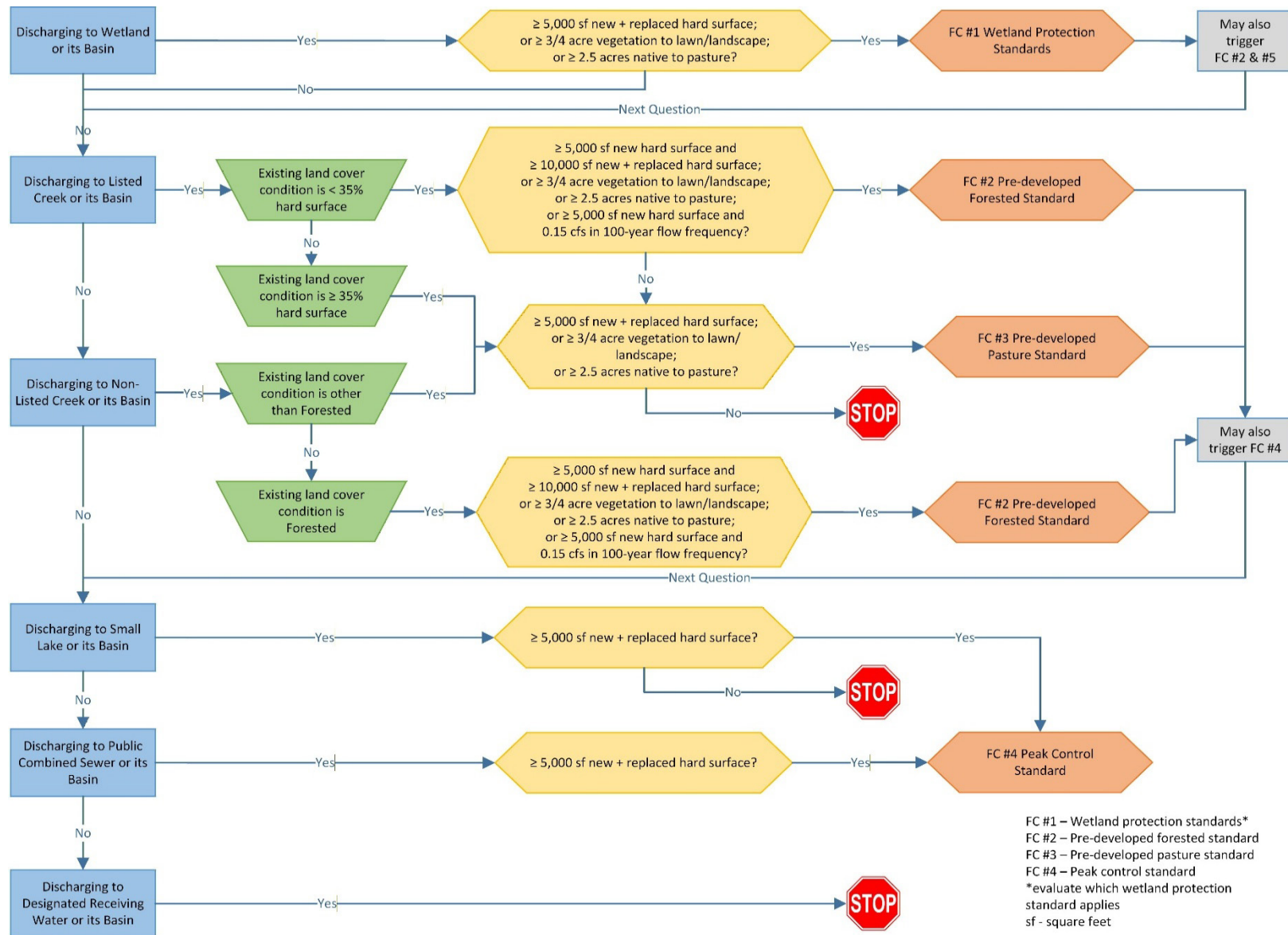


Figure 4.1B. Project Minimum Requirements for Parcel-based Projects (continued).

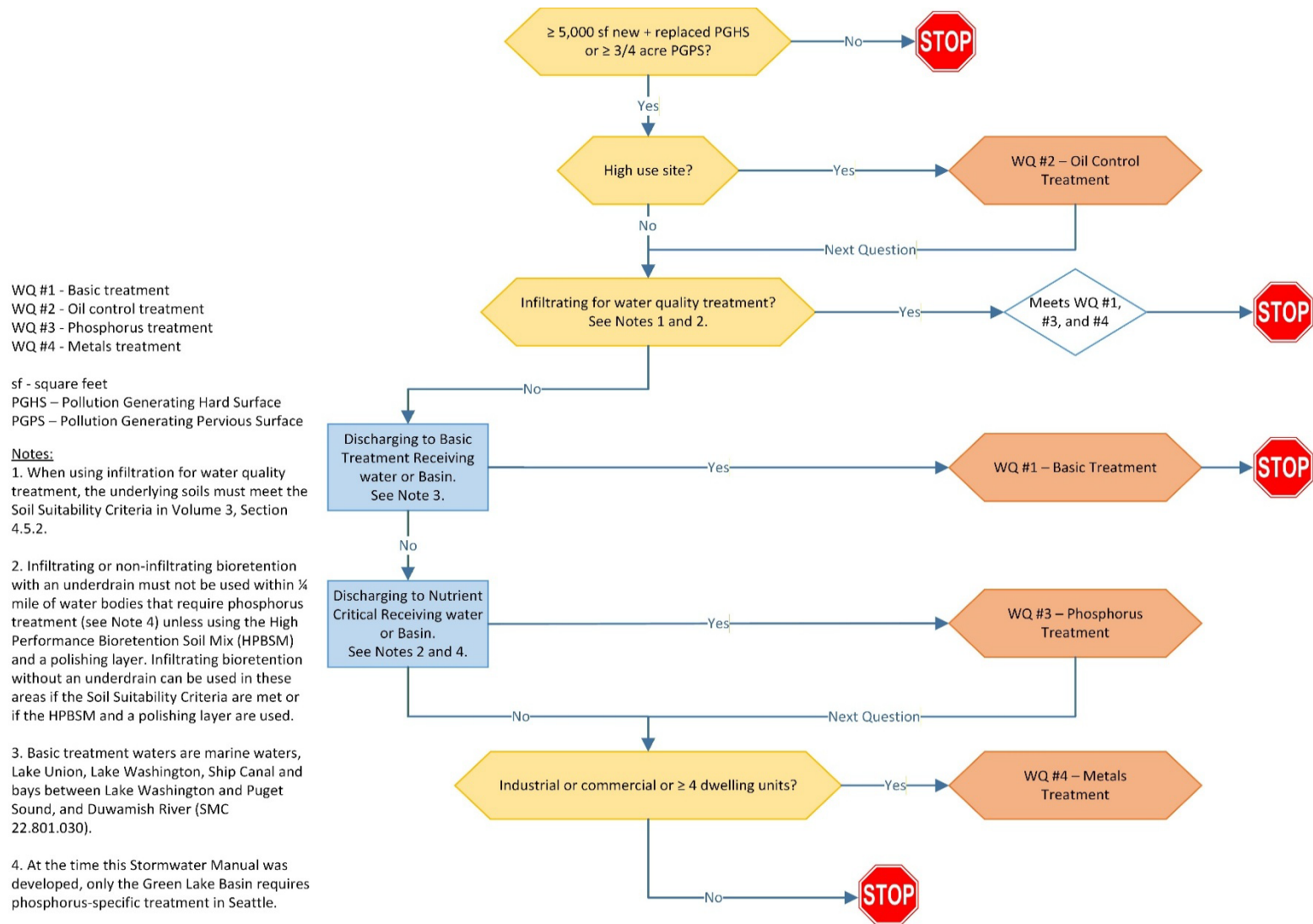


Figure 4.1C. Project Minimum Requirements for Parcel-based Projects (continued).

### 4.1.3. *Flow Control*

In addition to meeting a forested, pasture, or wetland protection standard, parcel-based projects discharging to a capacity-constrained system (SMC, Section 22.801.040) will also be required to meet the peak control standard (SMC, Subsection 22.805.080.B.5) if required per *Section 4.1.3.6 Parcel-based Projects Discharging to a Capacity-constrained System - Flow Control*.

#### 4.1.3.1. *Parcel-based Projects Discharging to Wetlands – Flow Control*

<b>Stormwater Code Language</b>
<p>SMC, 22.805.050 - Minimum requirements for parcel-based projects</p> <p>C.1 — <i>Discharges to wetlands. Parcel-based projects discharging into a wetland, or to the drainage basin of a wetland, shall:</i></p> <p>a. <i>Comply with Section 22.805.020 (Minimum requirements for all projects), including, but not limited to subsection 22.805.020.E (Protect wetlands).</i></p> <p>b. <i>Comply with the minimum requirements for wetland protection contained in subsection 22.805.080.C (Wetland protection standards) if:</i></p> <ol style="list-style-type: none"> <li>1) <i>The total new plus replaced hard surface is 5,000 square feet or more; or</i></li> <li>2) <i>The project converts 3/4 acres or more of vegetation to lawn or landscaped areas, and from the project there is a surface discharge into a natural or constructed conveyance system from the site; or</i></li> <li>3) <i>The project converts 2.5 acres or more of native vegetation to pasture and from the project there is a surface discharge into a natural or constructed conveyance system from the site.</i></li> </ol>
<b>References</b>
<ul style="list-style-type: none"> <li>• Volume 1, Section 2.2.1 – Parcel-based Project</li> <li>• Volume 1, Section 3.5 – Protect Wetlands</li> <li>• Volume 1, Section 5.3.1 (SMC, Section 22.805.080.C.1) – Wetland Protection Standards</li> <li>• SWMMWW Volume I, Appendix I-C (Ecology 2024)</li> </ul>

### 4.1.3.2. Parcel-based Projects Discharging to Listed Creek Basins – Flow Control

<b>Stormwater Code Language</b>
<p>SMC, 22.805.050 - Minimum requirements for parcel-based projects</p> <p><i>C. Flow control. Parcel-based projects shall meet the minimum requirements for flow control contained in Section 22.805.080, to the extent allowed by law, as prescribed below.</i></p> <p><i>2 — Discharges to listed creek basins. Parcel-based projects discharging into Blue Ridge Creek, Broadview Creek, Discovery Park Creek, Durham Creek, Frink Creek, Golden Gardens Creek, Kiwanis Ravine/Wolfe Creek, Licton Springs Creek, Madrona Park Creek, Mee-Kwa-Mooks Creek, Mount Baker Park Creek, Puget Creek, Riverview Creek, Schmitz Creek, Taylor Creek, or Washington Park Creek, or to the drainage basin of such creek, shall:</i></p> <p><i>a. Comply with subsection 22.805.080.D (Pre-developed forested standard) if the existing hard surface coverage is less than 35 percent and one or more of the following apply:</i></p> <ol style="list-style-type: none"> <li><i>1) The project adds 5,000 square feet or more of new hard surface and the total new plus replaced hard surface is 10,000 square feet or more; or</i></li> <li><i>2) The project converts 3/4 acres or more of vegetation to lawn or landscaped areas, and from the project there is a surface discharge into a natural or constructed conveyance system from the site; or</i></li> <li><i>3) The project converts 2.5 acres or more of native vegetation to pasture, and from the project there is a surface discharge into a natural or constructed conveyance system from the site; or</i></li> <li><i>4) The project adds 5,000 square feet or more of new hard surface and, through a combination of effective hard surfaces and converted pervious surfaces, causes a 0.15 cubic feet per second increase in the 100-year recurrence interval flow frequency as estimated using a continuous model approved by the Director.</i></li> </ol> <p><i>b. Comply with subsection 22.805.080.E (Pre-developed pasture standard) if the criteria in subsection 22.805.050.C.2.a do not apply and one or more apply:</i></p> <ol style="list-style-type: none"> <li><i>1) The total new plus replaced hard surface is 5,000 square feet or more; or</i></li> <li><i>2) The project converts 3/4 acres or more of vegetation to lawn or landscaped areas, and from the project there is a surface discharge into a natural or constructed conveyance system from the site; or</i></li> <li><i>3) The project converts 2.5 acres or more of native vegetation to pasture, and from the project there is a surface discharge into a natural or constructed conveyance system from the site.</i></li> </ol>
<b>References</b>
<ul style="list-style-type: none"> <li>• Volume 1, Section 2.2.1 – Parcel-based Project</li> <li>• Volume 1, Section 2.3 – Figures 2.5 and 2.6</li> <li>• Volume 1, Section 5.3.2 (SMC, Section 22.805.080.D) – Pre-developed Forested Standard</li> <li>• Volume 1, Section 5.3.3 (SMC, Section 22.805.080.E) – Pre-developed Pasture Standard</li> <li>• Volume 3, Section 3.4 – BMP Selection for Flow Control</li> <li>• Volume 3, Section 4.1 – Sizing Approach</li> </ul>

Note: The 0.15 cfs increase is a comparison of the post-project runoff to the existing condition runoff. The post-project runoff calculations may account for proposed BMPs.

### 4.1.3.3. Parcel-based Projects Discharging to Non-listed Creek Basins – Flow Control

<b>Stormwater Code Language</b>
<p>SMC, 22.805.050 - Minimum requirements for parcel-based projects</p> <p><i>C. Flow control. Parcel-based projects shall meet the minimum requirements for flow control contained in Section 22.805.080, to the extent allowed by law, as prescribed below.</i></p> <p><b>3 — Discharges to non-listed creek basins. Parcel-based projects discharging into a creek not listed in subsection 22.805.050.C.2, or to the drainage basin of such creek, shall:</b></p> <p><b>a. Comply with subsection 22.805.080.D (Pre-developed forested standard) if the existing land cover is forested and one or more of the following apply:</b></p> <ol style="list-style-type: none"> <li>1) <i>The project adds 5,000 square feet or more of new hard surface and the total new plus replaced hard surface is 10,000 square feet or more; or</i></li> <li>2) <i>The project converts 3/4 acres or more of vegetation to lawn or landscaped areas, and from the project there is a surface discharge into a natural or constructed conveyance system from the site; or</i></li> <li>3) <i>The project converts 2.5 acres or more of native vegetation to pasture, and from the project there is a surface discharge into a natural or constructed conveyance system from the site; or</i></li> <li>4) <i>The project adds 5,000 square feet or more of new hard surface and, through a combination of effective hard surfaces and converted pervious surfaces, causes a 0.15 cubic feet per second increase in the 100-year recurrence interval flow frequency as estimated using a continuous model approved by the Director.</i></li> </ol> <p><b>b. Comply with subsection 22.805.080.E (Pre-developed pasture standard) if the criteria in subsection 22.805.050.C.3.a do not apply and one or more of the following apply:</b></p> <ol style="list-style-type: none"> <li>1) <i>The total new plus replaced hard surface is 5,000 square feet or more; or</i></li> <li>2) <i>The project converts 3/4 acres or more of vegetation to lawn or landscaped areas, and from the project there is a surface discharge into a natural or constructed conveyance system from the site; or</i></li> <li>3) <i>The project converts 2.5 acres or more of native vegetation to pasture, and from the project there is a surface discharge into a natural or constructed conveyance system from the site.</i></li> </ol>
<b>References</b>
<ul style="list-style-type: none"> <li>• Volume 1, Section 2.2.1 – Parcel-based Project</li> <li>• Volume 1, Section 2.3 – Figures 2.5 and 2.6</li> <li>• Volume 1, Section 5.3.2 (SMC, Section 22.805.080.D) – Pre-developed Forested Standard</li> <li>• Volume 1, Section 5.3.3 (SMC, Section 22.805.080.E) – Pre-developed Pasture Standard</li> <li>• Volume 3, Section 3.4 – BMP Selection for Flow Control</li> <li>• Volume 3, Section 4.1 – Sizing Approach</li> </ul>

Note: The 0.15 cfs increase is a comparison of the post-project runoff to the existing condition runoff. The post-project runoff calculations may account for proposed BMPs.

**4.1.3.4. Parcel-based Projects Discharging to Small Lake Basins – Flow Control**

<b>Stormwater Code Language</b>
<p>SMC, 22.805.050 - Minimum requirements for parcel-based projects</p> <p><i>C. Flow control. Parcel-based projects shall meet the minimum requirements for flow control contained in Section 22.805.080, to the extent allowed by law, as prescribed below.</i></p> <p><i>4 — Discharges to small lake basins. Parcel-based projects discharging into Bitter Lake, Green Lake, or Haller Lake, or to the drainage basin of such lake, shall comply with subsection 22.805.080.G (Peak control standard) if the total new plus replaced hard surface is 5,000 square feet or more.</i></p>
<b>References</b>
<ul style="list-style-type: none"> <li>• Volume 1, Section 2.2.1 – Parcel-based Project</li> <li>• Volume 1, Section 2.3 – Figures 2.5 and 2.6</li> <li>• Volume 1, Section 5.3.5 (SMC, Section 22.805.080.G) – Peak Control Standard</li> <li>• Volume 3, Section 3.4 – BMP Selection for Flow Control</li> <li>• Volume 3, Section 4.1 – Sizing Approach</li> </ul>

**4.1.3.5. Parcel-based Projects Discharging to Public Combined Sewer – Flow Control**

At the time this Manual was developed, one public combined sewer basin was determined to have sufficient capacity to carry existing and anticipated loads. Parcel-based projects are not required to provide peak flow control in this basin. Refer to the SDCI website to determine which basins are included in this category ([www.seattle.gov/sdci/codes/codes-we-enforce-\(a-z\)/stormwater-code](http://www.seattle.gov/sdci/codes/codes-we-enforce-(a-z)/stormwater-code)).

<b>Stormwater Code Language</b>
<p>SMC, 22.805.050 - Minimum requirements for parcel-based projects</p> <p><i>C. Flow control. Parcel-based projects shall meet the minimum requirements for flow control contained in Section 22.805.080, to the extent allowed by law, as prescribed below.</i></p> <p><i>5 — Discharges to public combined sewer. Unless the Director of SPU has determined that the public combined sewer has sufficient capacity to carry existing and anticipated loads, parcel-based projects discharging into the public combined sewer or its basin shall comply with subsection 22.805.080.G (Peak control standard) if the total new plus replaced hard surface is 5,000 square feet or more.</i></p>
<b>References</b>
<ul style="list-style-type: none"> <li>• Volume 1, Section 2.2.1 – Parcel-based Project</li> <li>• Volume 1, Section 2.3 - Figure 2.7 – Public Combined Sewer Basins</li> <li>• Volume 1, Section 5.3.5 (SMC, Section 22.805.080.G) – Peak Control Standard</li> <li>• Volume 3, Section 3.4 – BMP Selection for Flow Control</li> <li>• Volume 3, Section 4.1 – Sizing Approach</li> </ul>

#### 4.1.3.6. Parcel-based Projects Discharging to a Capacity-constrained System – Flow Control

<b>Stormwater Code Language</b>
<p>SMC, 22.805.050 - Minimum requirements for parcel-based projects</p> <p><i>C. Flow control. Parcel-based projects shall meet the minimum requirements for flow control contained in Section 22.805.080, to the extent allowed by law, as prescribed below.</i></p> <p><i>6 — Discharges to a capacity-constrained system. In addition to applicable minimum requirements for flow control in subsection 22.805.050.C.1 through subsection 22.805.050.C.5, parcel-based projects discharging into a capacity-constrained system or its basin shall also comply with subsection 22.805.080.G (Peak control standard) if the total new plus replaced hard surface is 5,000 square feet or more unless the downstream system only includes ditches or culverts and the system has been determined to have sufficient capacity as specified in subsection 22.805.020.H (Ensure sufficient capacity).</i></p>
<b>References</b>
<ul style="list-style-type: none"> <li>• Volume 1, Section 2.2.1 – Parcel-based Project</li> <li>• Volume 1, Section 2.3 – Figures 2.10</li> <li>• Volume 1, Section 3.8 – (SMC, Section 22.805.020.H) - Ensure Sufficient Capacity</li> <li>• Volume 1, Section 4.1.3.1 (SMC, Section 22.805.050.C.1) – Discharges to Wetlands</li> <li>• Volume 1, Section 4.1.3.2 (SMC, Section 22.805.050.C.2) – Discharges to Listed Creek Basins</li> <li>• Volume 1, Section 4.1.3.3 (SMC, Section 22.805.050.C.3) – Discharges to Non-listed Creek Basins</li> <li>• Volume 1, Section 4.1.3.4 (SMC, Section 22.805.050.C.4) – Discharges to Small Lake Basins</li> <li>• Volume 1, Section 4.1.3.5 (SMC, Section 22.805.050.C.5) – Discharges to Public Combined Sewer</li> <li>• Volume 1, Section 4.1.3.6 (SMC, Section 22.805.050.C.6) – Discharges to Capacity-constrained System</li> <li>• Volume 1, Section 4.1.3.7 (SMC, Section 22.805.050.C.7) – Discharges from Groundwater</li> <li>• Volume 1, Section 5.3.5 (SMC, Section 22.805.080.G) – Peak Control Standard</li> <li>• Volume 3, Section 3.4 – BMP Selection for Flow Control</li> <li>• Volume 3, Section 4.1 – Sizing Approach</li> </ul>

#### 4.1.3.7. Parcel-based Projects Discharging Groundwater – Flow Control

<b>Stormwater Code Language</b>
<p>SMC, 22.805.050 - Minimum requirements for parcel-based projects</p> <p><i>C. Flow control. Parcel-based projects shall meet the minimum requirements for flow control contained in Section 22.805.080, to the extent allowed by law, as prescribed below.</i></p> <p><i>7 — Discharges from groundwater. In addition to applicable minimum requirements for flow control in subsection 22.805.050.C.1 through subsection 22.805.050.C.6, parcel-based projects that will permanently discharge groundwater to a public drainage system or to a public combined sewer shall also comply with subsection 22.805.080.G (Peak control standard) if the total new plus replaced hard surface is 2,000 square feet or more.</i></p>
<p>SMC, 22.801.080 "G" — "Groundwater" means "groundwater" as defined in chapter 173-200 WAC (Water Quality Standards for Groundwaters of the State of Washington) and includes water, perched or otherwise, in a saturated zone or stratum beneath the surface of land or below a surface water body.</p>

<b>References</b>
<ul style="list-style-type: none"> <li>• Volume 1, Section 2.2.1 – Parcel-based Project</li> <li>• Volume 1, Section 4.1.3.1 (SMC, Section 22.805.050.C.1) – Discharges to Wetlands</li> <li>• Volume 1, Section 4.1.3.2 (SMC, Section 22.805.050.C.2) – Discharges to Listed Creek Basins</li> <li>• Volume 1, Section 4.1.3.3 (SMC, Section 22.805.050.C.3) – Discharges to Non-listed Creek Basins</li> <li>• Volume 1, Section 4.1.3.4 (SMC, Section 22.805.050.C.4) – Discharges to Small Lake Basins</li> <li>• Volume 1, Section 4.1.3.5 (SMC, Section 22.805.050.C.5) – Discharges to Public Combined Sewer</li> <li>• Volume 1, Section 4.1.3.6 (SMC, Section 22.805.050.C.6) – Discharges to Capacity-constrained System</li> <li>• Volume 1, Section 4.1.3.7 (SMC, Section 22.805.050.C.7) – Discharges from Groundwater</li> <li>• Volume 1, Section 5.3.5 (SMC, Section 22.805.080.B.5) – Peak Control Standard</li> </ul>

Note: If the subsurface drainage for a project (e.g., footing drains, wall drains) extends into a zone containing groundwater, perched or otherwise, evaluation of groundwater discharge is required.

If the total estimated groundwater discharge rate from the project site during the wet season is less than 5 gallons per minute for sites less than 1 acre or less than 5 gallons per minute per acre for sites 1 acre or greater, then the groundwater discharge is de minimis and will not trigger Peak Control Standard. However, if the flow control is triggered by another condition, the estimated groundwater discharge rate must be considered in the sizing of the flow control BMPs. Estimates of groundwater discharge must be made by a licensed geotechnical engineer or hydrogeologist.

#### **4.1.4. Water Quality Treatment**

<b>Stormwater Code Language</b>
<p>SMC, 22.805.050 - Minimum requirements for parcel-based projects</p> <p><i>D — Treatment. Parcel-based projects not discharging to the public combined sewer shall comply with the minimum requirements for treatment contained in Section 22.805.090 for flows from the total new plus replaced pollution-generating hard surface and the new plus replaced pollution-generating pervious surface, to the extent allowed by law, if:</i></p> <ol style="list-style-type: none"> <li>1. <i>The total new plus replaced pollution-generating hard surface is 5,000 square feet or more; or</i></li> <li>2. <i>The total new plus replaced pollution-generating pervious surfaces is 3/4 acres or more, and from which there is a surface discharge in a natural or constructed conveyance system from the site.</i></li> </ol>
<b>References</b>
<ul style="list-style-type: none"> <li>• Volume 1, Section 2.2.1 – Parcel-based Project</li> <li>• Volume 1, Section 5.4 (SMC, Section 22.805.090) – Water Quality Treatment</li> <li>• Volume 3, Section 3.5 – BMP Selection for Water Quality Treatment</li> <li>• Volume 3, Section 4.1 – Sizing Approach</li> </ul>

## 4.2. Trail and Sidewalk Projects

The applicable code language and references for trail and sidewalk projects are summarized below. Note that trail and sidewalk projects are not required to install flow control or water quality treatment BMPs if the project meets the definition of a trail or sidewalk project.

### 4.2.1. Soil Amendment

<b>Stormwater Code Language</b>
<p>SMC, 22.805.040 — <i>Minimum requirements for trail and sidewalk projects</i></p> <p>A. <i>Soil amendment. Retain and protect undisturbed soil in areas not being developed, and prior to completion of the project, amend all new, replaced, and disturbed topsoil (including construction lay-down areas) with organic matter to the extent required by and in compliance with the rules promulgated by the Director.</i></p>
<b>References</b>
<ul style="list-style-type: none"> <li>• Volume 1, Section 2.2.2 – Sidewalk Project</li> <li>• Volume 1, Section 2.2.3 – Trail Project</li> <li>• Volume 1, Section 5.1 – Soil Amendment</li> <li>• Volume 3, Section 5.1 – Soil Amendment BMP</li> </ul>

### 4.2.2. On-site Stormwater Management

<b>Stormwater Code Language</b>
<p>SMC, 22.805.040 — <i>Minimum requirements for trail and sidewalk projects</i></p> <p>B. <i>On-site stormwater management. All trail and sidewalk projects with 2,000 square feet or more of new plus replaced hard surface or 7,000 square feet or more of land disturbing activity shall meet the minimum requirements for on-site stormwater management contained in Section 22.805.070, to the extent allowed by law.</i></p>
<b>References</b>
<ul style="list-style-type: none"> <li>• Volume 1, Section 2.2.2 – Sidewalk Project</li> <li>• Volume 1, Section 2.2.3 – Trail Project</li> <li>• Volume 1, Section 5.2 (SMC, Section 22.805.070)– On-site Stormwater Management</li> <li>• Volume 3, Section 3.3 – BMP Selection for On-site Stormwater Management</li> </ul>

## 4.3. Roadway Projects

Roadway projects must meet the minimum requirements for soil amendment (SMC, Subsection 22.805.060.A), on-site stormwater management (SMC, Subsection 22.805.020.F), flow control (SMC, Section 22.805.080), and water quality treatment (SMC, Section 22.805.090) when applicable. Key minimum requirements for roadway projects are summarized in Figures 4.2a through 4.2c.

### 4.3.1. Soil Amendment

<b>Stormwater Code Language</b>
<p>SMC, 22.805.060- <i>Minimum requirements for roadway projects</i></p> <p><i>A — Soil amendment. Retain and protect undisturbed soil in areas not being developed, and prior to completion of the project, amend all new, replaced, and disturbed topsoil (including construction lay-down areas) with organic matter to the extent required by and in compliance with the rules promulgated by the Director.</i></p>
<b>References</b>
<ul style="list-style-type: none"> <li>• Volume 1, Section 2.2.4 – Roadway Project</li> <li>• Volume 1, Section 5.1 – Soil Amendment</li> <li>• Volume 3, Section 5.1 – Soil Amendment BMP</li> </ul>

### 4.3.2. On-site Stormwater Management

<b>Stormwater Code Language</b>
<p>SMC, 22.805.060- <i>Minimum requirements for roadway projects</i></p> <p><i>B — On-site stormwater management. All roadway projects with 2,000 square feet or more of new plus replaced hard surface or 7,000 square feet or more of land disturbing activity shall meet the requirements for on-site stormwater management contained in Section 22.805.070, to the extent allowed by law, except as provided in subsection 22.805.060.E.</i></p>
<b>References</b>
<ul style="list-style-type: none"> <li>• Volume 1, Section 2.2.4 – Roadway Project</li> <li>• Volume 1, Section 5.2 (SMC, Section 22.805.070) – On-site Stormwater Management</li> <li>• Volume 3, Section 3.3 – BMP Selection for On-site Stormwater Management</li> </ul>

### 4.3.3. Flow Control

In addition to meeting a forested, pasture, or wetland protection standard, roadway projects discharging to a capacity-constrained system (SMC, Section 22.801.040) will also be required to meet the existing condition standard (SMC, Subsection 22.805.080.B.4) if required per *Section 4.3.3.5 Roadway Projects Discharging to a Capacity-Constrained System - Flow Control*.

### 4.3.3.1. Roadway Projects Discharging to Wetlands – Flow Control

<b>Stormwater Code Language</b>
<p>SMC, 22.805.060 - <i>Minimum requirements for roadway projects</i></p> <p><i>C. Flow control. Roadway projects shall meet the minimum requirements for flow control contained in Section 22.805.080, to the extent allowed by law, as prescribed below, except as provided in subsection 22.805.060.E.</i></p> <p><i>1 — Discharges to wetlands. Roadway projects discharging into a wetland or to the drainage basin of a wetland, shall:</i></p> <p><i>a. Comply with Section 22.805.020 (Minimum requirements for all projects), including, but not limited to subsection 22.805.020.E (Protect wetlands).</i></p> <p><i>b. Comply with the minimum requirements for wetland protection contained in subsection 22.805.080.C (Wetland protection standards) if the existing hard surface coverage is less than 35 percent and one or more of the following apply:</i></p> <ol style="list-style-type: none"> <li><i>1) The total new plus replaced hard surface is 5,000 square feet or more; or</i></li> <li><i>2) The project converts 3/4 acres or more of vegetation to lawn or landscaped areas, and from the project there is a surface discharge into a natural or constructed conveyance system from the site; or</i></li> <li><i>3) The project converts 2.5 acres or more of native vegetation to pasture and from the project there is a surface discharge into a natural or constructed conveyance system from the site.</i></li> </ol> <p><i>c. Comply with the minimum requirements for wetland protection contained in subsection 22.805.080.C (Wetland protection standards) if the existing hard surface coverage is greater than or equal to 35 percent and one or more of the following apply:</i></p> <ol style="list-style-type: none"> <li><i>1) The total new plus replaced hard surface is 10,000 square feet or more. If the new plus replaced hard surfaces total 50 percent or more of the existing hard surfaces within the project limits, comply with subsection 22.805.080.C for the flows from the total new plus replaced hard surfaces; if the new plus replaced hard surfaces total less than 50 percent, comply with subsection 22.805.080.C for the flows from the total new hard surfaces. The project limits are defined by the length of the project and the width of the right-of-way; or</i></li> <li><i>2) The project converts 3/4 acres or more of vegetation to lawn or landscaped areas, and from the project there is a surface discharge into a natural or constructed conveyance system from the site; or</i></li> <li><i>3) The project converts 2.5 acres or more of native vegetation to pasture and from the project there is a surface discharge into a natural or constructed conveyance system from the site.</i></li> </ol>
<b>References</b>
<ul style="list-style-type: none"> <li>• Volume 1, Section 2.2.4 – Roadway Project</li> <li>• Volume 1, Section 3.5 (SMC, Section 22.805.020.E) – Protect Wetlands</li> <li>• Volume 1, Section 5.3.1 (SMC, Section 22.805.080.B.1) – Wetland Protection Standards</li> <li>• SWMMWW Volume I, Appendix I-C (Ecology 2024)</li> </ul>

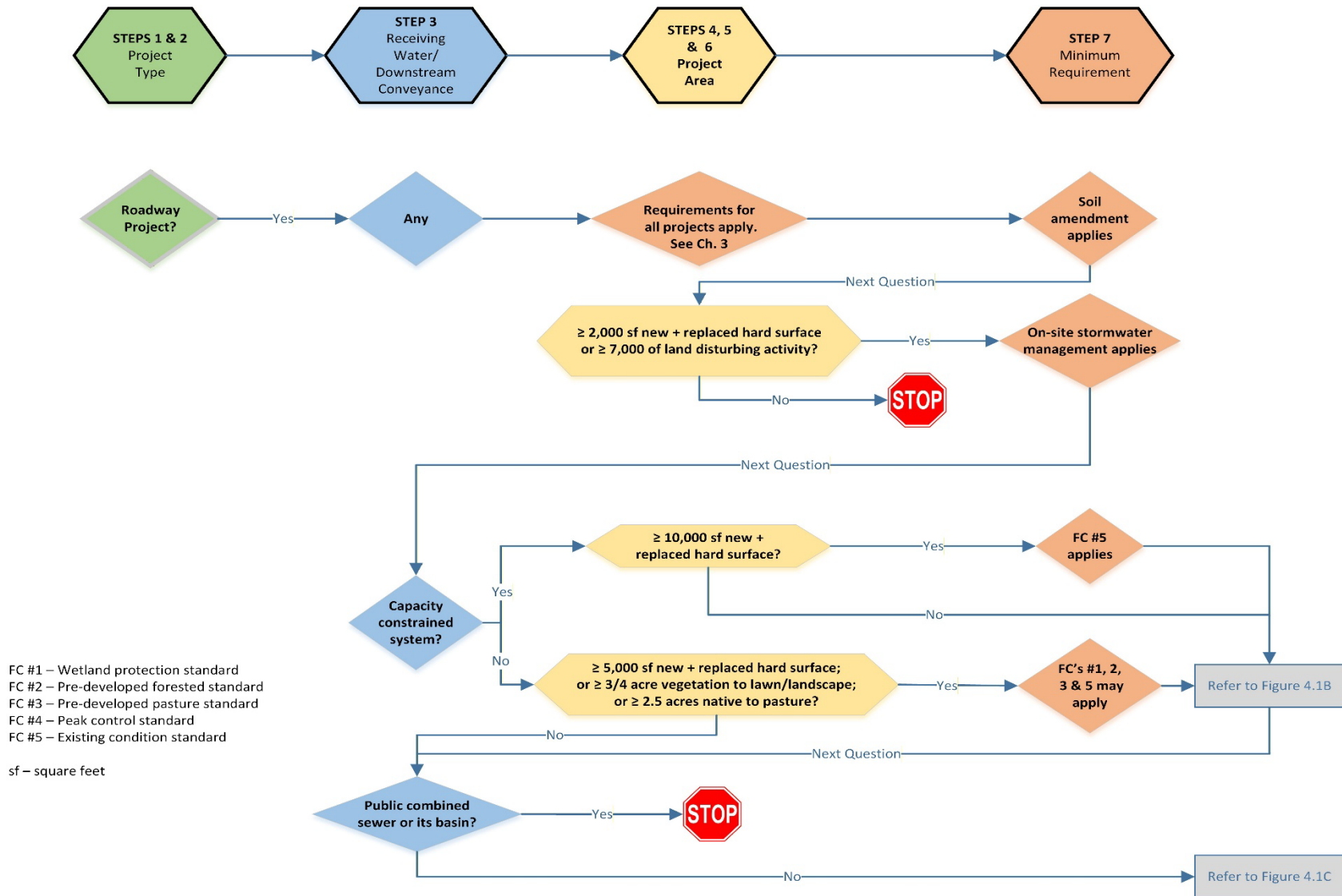


Figure 4.2A. Project Minimum Requirements for Roadway Projects.

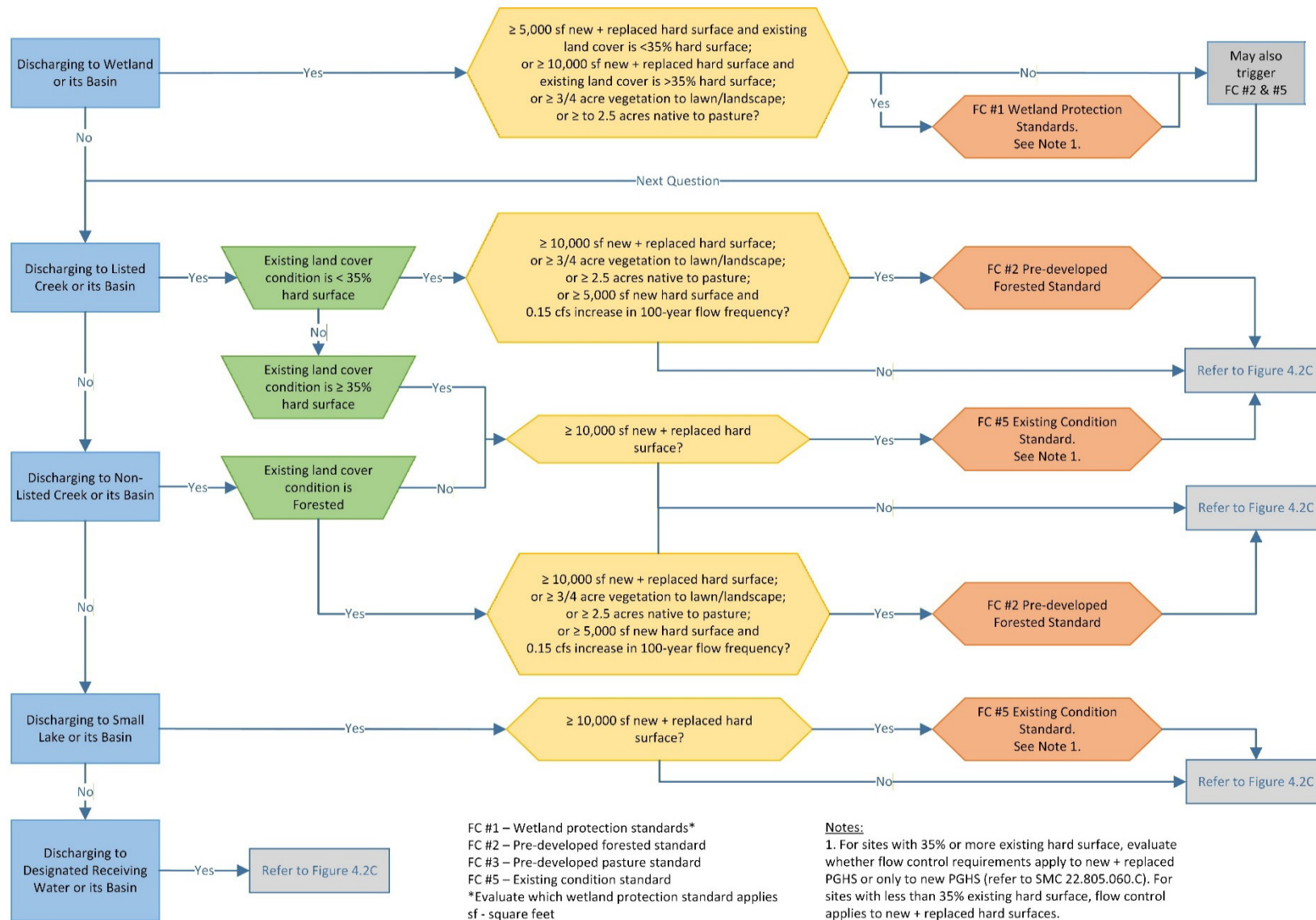


Figure 4.2B. Project Minimum Requirements for Roadway Projects (continued).

WQ #1 - Basic treatment  
 WQ #2 - Oil control treatment  
 WQ #3 - Phosphorus treatment  
 WQ #4 - Metals treatment

sf – square feet  
 PGHS – Pollution Generating Hard Surface  
 PGPS – Pollution Generating Pervious Surface  
 AADT – Annual Average Daily Traffic

**Notes:**

1. For sites with 35% or more existing hard surface, evaluate whether water quality treatment requirements apply to new + replaced PGHS or only to new PGHS. For sites with less than 35% existing hard surface, water quality treatment applies to new + replaced PGHS (refer to SMC 22.805.060.D).

2. When using infiltration for water quality treatment, the underlying soils must meet the Soil Suitability Criteria in Volume 3, Section 4.5.2.

3. Infiltrating or non-infiltrating bioretention with an underdrain must not be used within ¼ mile of water bodies that require phosphorus treatment (see Note 5) unless using the High Performance Bioretention Soil Mix (HPBSM) and a polishing layer. Infiltrating bioretention without an underdrain can be used these areas if the Soil Suitability Criteria are met or is the HPSNM and a polishing layer are used.

4. Basic treatment waters are marine waters, Lake Union, Lake Washington, Ship Canal and bays between Lake Washington and the Puget Sound, and Duwamish (SMC 22.801.030).

5. At the time this Stormwater Manual was developed, only the Green Lake basin requires phosphorus-specific treatment in Seattle.

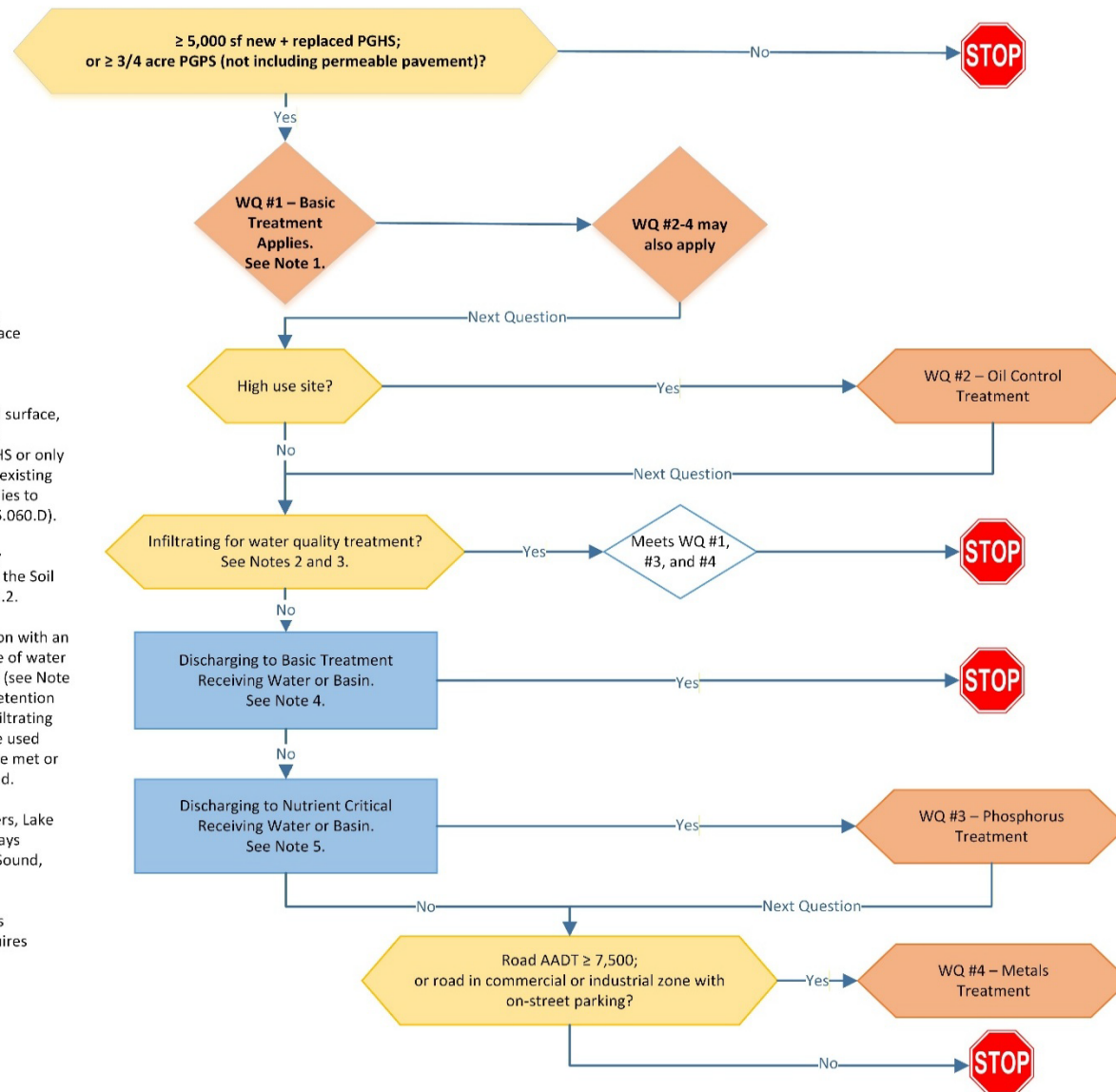


Figure 4.2C. Project Minimum Requirements for Roadway Projects (continued).

### 4.3.3.2. Roadway Projects Discharging to Listed Creek Basins – Flow Control

<b>Stormwater Code Language</b>
<p>SMC, 22.805.060- <i>Minimum requirements for roadway projects</i></p> <p><i>C. Flow control. Roadway projects shall meet the minimum requirements for flow control contained in Section 22.805.080, to the extent allowed by law, as prescribed below, except as provided in subsection 22.805.060.E.</i></p> <p><i>2 — Discharges to listed creek basins. Roadway projects discharging into Blue Ridge Creek, Broadview Creek, Discovery Park Creek, Durham Creek, Frink Creek, Golden Gardens Creek, Kiwanis Ravine/Wolfe Creek, Licton Springs Creek, Madrona Park Creek, Mee-Kwa-Mooks Creek, Mount Baker Park Creek, Puget Creek, Riverview Creek, Schmitz Creek, Taylor Creek, or Washington Park Creek, or to the drainage basin of such creek, shall:</i></p> <p><i>a. Comply with subsection 22.805.080.D (Pre-developed forested standard) if the existing hard surface coverage is less than 35 percent and one or more of the following apply:</i></p> <ol style="list-style-type: none"> <li><i>1) The project adds 10,000 square feet or more of new plus replaced hard surface; or</i></li> <li><i>2) The project converts 3/4 acres or more of vegetation to lawn or landscaped areas, and from the project there is a surface discharge into a natural or constructed conveyance system from the site; or</i></li> <li><i>3) The project converts 2.5 acres or more of native vegetation to pasture, and from the project there is a surface discharge into a natural or constructed conveyance system from the site; or</i></li> <li><i>4) The project adds 5,000 square feet or more of new hard surface and, through a combination of effective hard surfaces and converted pervious surfaces, causes a 0.15 cubic feet per second increase in the 100-year recurrence interval flow frequency as estimated using a continuous model approved by the Director.</i></li> </ol> <p><i>b. Comply with subsection 22.805.080.F (Existing condition standard) if the criteria in subsection 22.805.060.C.2.a do not apply and the total new plus replaced hard surface is 10,000 square feet or more, and:</i></p> <ol style="list-style-type: none"> <li><i>1) If the new plus replaced hard surfaces total 50 percent or more of the existing hard surfaces within the project limits, comply with subsection 22.805.080.F (Existing condition standard) for the flows from the total new plus replaced hard surfaces. The project limits are defined by the length of the project and the width of the right-of-way; or</i></li> <li><i>2) If the new plus replaced hard surfaces total less than 50 percent of the existing hard surfaces within the project limits, comply with subsection 22.805.080.F (Existing condition standard) for the flows from the total new hard surfaces. The project limits are defined by the length of the project and the width of the right-of-way.</i></li> </ol>
<b>References</b>
<ul style="list-style-type: none"> <li>• Volume 1, Section 2.2.4 – Roadway Project</li> <li>• Volume 1, Section 2.3 – Figures 2.5 and 2.6</li> <li>• Volume 1, Section 5.3.2 (SMC, Section 22.805.080.D) – Pre-developed Forested Standard</li> <li>• Volume 1, Section 5.3.4 (SMC, Section 22.805.080.F) – Existing Condition Standard</li> <li>• Volume 3, Section 3.4 – BMP Selection for Flow Control</li> <li>• Volume 3, Section 4.1 – Sizing Approach</li> </ul>

### 4.3.3.3. Roadway Projects Discharging to Non-listed Creek Basins – Flow Control

<b>Stormwater Code Language</b>
<p>SMC, 22.805.060 - <i>Minimum requirements for roadway projects</i></p> <p><i>C. Flow control. Roadway projects shall meet the minimum requirements for flow control contained in Section 22.805.080, to the extent allowed by law, as prescribed below, except as provided in subsection 22.805.060.E.</i></p> <p><i>3 – Discharges to non-listed creek basins. Roadway projects discharging into a creek not listed in subsection 22.805.060.C.2, or to the drainage basin of such creek, shall:</i></p> <p><i>a. Comply with subsection 22.805.080.D (Pre-developed forested standard) if the existing land cover is forested and one or more of the following apply:</i></p> <ol style="list-style-type: none"> <li><i>1) The project adds 10,000 square feet or more of new plus replaced hard surface; or</i></li> <li><i>2) The project converts 3/4 acres or more of vegetation to lawn or landscaped areas, and from the project there is a surface discharge into a natural or constructed conveyance system from the site; or</i></li> <li><i>3) The project converts 2.5 acres or more of native vegetation to pasture, and from the project there is a surface discharge into a natural or constructed conveyance system from the site; or</i></li> <li><i>4) The project adds 5,000 square feet or more of new hard surface and, through a combination of effective hard surfaces and converted pervious surfaces, causes a 0.15 cubic feet per second increase in the 100-year recurrence interval flow frequency as estimated using a continuous model approved by the Director.</i></li> </ol> <p><i>b. Comply with subsection 22.805.080.F (Existing condition standard) if the criteria in subsection 22.805.060.C.3.a do not apply and the total new plus replaced hard surface is 10,000 square feet or more, and:</i></p> <ol style="list-style-type: none"> <li><i>1) If the new plus replaced hard surfaces total 50 percent or more of the existing hard surfaces within the project limits, comply with subsection 22.805.080.F (Existing condition standard) for the flows from the total new plus replaced hard surfaces. The project limits are defined by the length of the project and the width of the right-of-way; or</i></li> <li><i>2) If the new plus replaced hard surfaces total less than 50 percent of the existing hard surfaces within the project limits, comply with subsection 22.805.080.F (Existing condition standard) for the flows from the total new hard surfaces. The project limits are defined by the length of the project and the width of the right-of-way.</i></li> </ol>
<b>References</b>
<ul style="list-style-type: none"> <li>• Volume 1, Section 2.2.4 – Roadway Project</li> <li>• Volume 1, Section 2.3 – Figures 2.5 and 2.6</li> <li>• Volume 1, Section 5.3.2 (SMC, Section 22.805.080.D) – Pre-developed Forested Standard</li> <li>• Volume 1, Section 5.3.4 (SMC, Section 22.805.080.F) – Existing Condition Standard</li> <li>• Volume 3, Section 3.4 – BMP Selection for Flow Control</li> <li>• Volume 3, Section 4.1 – Sizing Approach</li> </ul>

#### 4.3.3.4. Roadway Projects Discharging to Small Lake Basins – Flow Control

<b>Stormwater Code Language</b>
<p>SMC, 22.805.060 - <i>Minimum requirements for roadway projects</i></p> <p><i>C. Flow control. Roadway projects shall meet the minimum requirements for flow control contained in Section 22.805.080, to the extent allowed by law, as prescribed below, except as provided in subsection 22.805.060.E.</i></p> <p><i>4 – Discharges to small lake basins. Roadway projects discharging into Bitter Lake, Green Lake, or Haller Lake, or to the drainage basin of such lake, shall comply with subsection 22.805.080.F (Existing condition standard) if the total new plus replaced hard surface is 10,000 square feet or more, and:</i></p> <p><i>a. If the new plus replaced hard surfaces total 50 percent or more of the existing hard surfaces within the project limits, comply with subsection 22.805.080.F (Existing condition standard) for the flows from the total new plus replaced hard surfaces. The project limits are defined by the length of the project and the width of the right-of-way; or</i></p> <p><i>b. If the new plus replaced hard surfaces total less than 50 percent of the existing hard surfaces within the project limits, comply with subsection 22.805.080.F (Existing condition standard) for the flows from the total new hard surfaces. The project limits are defined by the length of the project and the width of the right-of-way.</i></p>
<b>References</b>
<ul style="list-style-type: none"> <li>• Volume 1, Section 2.2.4 – Roadway Project</li> <li>• Volume 1, Section 2.3 – Figures 2.5 and 2.6</li> <li>• Volume 1, Section 5.3.4 (SMC, Section 22.805.080.F) – Existing Condition Standard</li> <li>• Volume 3, Section 3.4 – BMP Selection for Flow Control</li> <li>• Volume 3, Section 4.1 – Sizing Approach</li> </ul>

#### 4.3.3.5. **Roadway Projects Discharging to a Capacity-constrained System – Flow Control**

<b>Stormwater Code Language</b>
<p>SMC, 22.805.060- <i>Minimum requirements for roadway projects</i></p> <p><i>C. Flow control. Roadway projects shall meet the minimum requirements for flow control contained in Section 22.805.080, to the extent allowed by law, as prescribed below, except as provided in subsection 22.805.060.E.</i></p> <p><i>5 – Discharges to a capacity-constrained system. In addition to applicable minimum requirements for flow control in subsection 22.805.060.C.1 through subsection 22.805.060.C.4, roadway projects discharging into a capacity-constrained system or its basin shall also comply with subsection 22.805.080.F (Existing condition standard) if the total new hard surface is 10,000 square feet or more unless the downstream system only includes ditches or culverts and has been determined to have sufficient capacity as specified in 22.805.020.H (Ensure sufficient capacity).</i></p>
<p>SMC, 22.801.040 – <i>"Capacity-constrained system" means a drainage system or public combined sewer that the Director of SPU has determined to have inadequate capacity to carry existing and anticipated loads, or a drainage system that includes ditches or culverts.</i></p>
<b>References</b>
<ul style="list-style-type: none"> <li>• Volume 1, Section 2.2.4 – Roadway Project</li> <li>• Volume 1, Section 2.3 – Figures 2.10</li> <li>• Volume 1, Section 3.8 – (SMC, Section 22.805.020.H) - Ensure Sufficient Capacity</li> <li>• Volume 1, Section 5.3.4 (SMC, Section 22.805.080.F) – Existing Condition Standard</li> <li>• Volume 3, Section 3.4 – BMP Selection for Flow Control</li> <li>• Volume 3, Section 4.1 – Sizing Approach</li> </ul>

### 4.3.4. *Water Quality Treatment*

<b>Stormwater Code Language</b>
<p>See SMC, 22.805.060. – <i>Minimum requirements for roadway projects</i></p> <p><b>D.</b> <i>Treatment. Roadway projects not discharging to the public combined sewer shall, to the extent allowed by law, except as provided in subsection 22.805.060.E:</i></p> <ol style="list-style-type: none"> <li>1. <i>If the site has less than 35 percent existing hard surface coverage, and the project's total new plus replaced pollution-generating hard surface is 5,000 square feet or more, comply with the minimum requirements for treatment contained in Section 22.805.090 for flows from the total new plus replaced pollution-generating hard surface and new plus replaced pollution-generating pervious surface; and</i></li> <li>2. <i>If the site has greater than or equal to 35 percent existing hard surface coverage and the project's total new plus replaced pollution-generating hard surface is 5,000 square feet or more, and</i> <ol style="list-style-type: none"> <li>a. <i>If the new plus replaced pollution-generating hard surfaces total 50 percent or more of the existing hard surfaces within the project limits, comply with the minimum requirements for treatment contained in Section 22.805.090 for flows from the total new plus replaced pollution-generating hard surface and new plus replaced pollution-generating pervious surface. The project limits are defined by the length of the project and the width of the right-of-way; or</i></li> <li>b. <i>If the new plus replaced pollution-generating hard surfaces total less than 50 percent of the existing hard surfaces within the project limits, comply with the minimum requirements for treatment contained in Section 22.805.090 for flows from the total new pollution-generating hard surface and new pollution-generating pervious surface. The project limits are defined by the length of the project and the width of the right-of-way; and</i></li> </ol> </li> <li>3. <i>If the total new plus replaced pollution-generating pervious surfaces is 3/4 acres or more, and from which there is a surface discharge in a natural or constructed conveyance system from the site, comply with the minimum requirements for treatment contained in Section 22.805.090 for flows from the total new plus replaced pollution-generating pervious surface and the new plus replaced pollution-generating hard surface.</i></li> </ol>
<b>References</b>
<ul style="list-style-type: none"> <li>• Volume 1, Section 2.2.4 – Roadway Project</li> <li>• Volume 1, Section 5.4 (SMC, Section 22.805.090) – Water Quality Treatment</li> <li>• Volume 3, Section 3.5 – BMP Selection for Water Quality Treatment</li> <li>• Volume 3, Section 4.1 – Sizing Approach</li> </ul>

## CHAPTER 5 – Minimum Requirement Standards

This chapter summarizes the standards related to the following minimum requirements:

- Soil amendment (*Section 5.1*)
- On-site stormwater management (*Section 5.2*)
- Flow control (*Section 5.3*)
- Water quality treatment (*Section 5.4*)

### 5.1. Soil Amendment

Projects triggering this minimum requirement must retain and protect undisturbed soil in areas not being developed and, prior to completion of the project, amend all new, replaced, and disturbed topsoil with organic matter. General soil amendment requirements included in the Stormwater Code are summarized below. Refer to *Volume 3, Section 5.1 - Soil Amendment BMP* for soil amendment requirements.

<b>Stormwater Code Language</b>
See SMC, Subsection 22.805.040.A; SMC, Subsection 22.805.050.A; SMC, Subsection 22.805.060.A – <i>Soil amendment. Retain and protect undisturbed soil in areas not being developed, and prior to completion of the project, amend all new, replaced, and disturbed topsoil (including construction lay-down areas) with organic matter to the extent required by and in compliance with the rules promulgated by the Director.</i>

### 5.2. On-site Stormwater Management

Projects triggering this minimum requirement must evaluate on-site stormwater management to meet the applicable design requirements for the specific project type and discharge location. On-site stormwater management includes BMPs that can be used to meet flow control and water quality treatment requirements. General on-site stormwater management requirements included in SMC, Section 22.805.070 are summarized below. Refer to *Section 5.2.1* and *5.2.2* for the On-site Performance Standard and the On-site List Approach.

<b>Stormwater Code Language</b>
<p>SMC, 22.805.070 - <i>Minimum requirements for on-site stormwater management</i></p> <p>A. <i>Applicability. The requirements of this Section 22.805.070 apply as required in Section 22.805.040 to Section 22.805.060.</i></p> <p>B. <i>Requirements. On-site stormwater management shall be installed to the extent allowed by law and maintained in compliance with the rules promulgated by the Director to receive flows from that portion of the site being developed and shall:</i></p> <ol style="list-style-type: none"> <li>1. <i>Comply with either:</i> <ol style="list-style-type: none"> <li>a. <i>Subsection 22.805.070.C (On-site performance standard); or</i></li> <li>b. <i>Subsection 22.805.070.D (On-site lists).</i></li> </ol> </li> </ol>
<b>References</b>
<ul style="list-style-type: none"> <li>• Volume 1, Section 4.1 – On-site Stormwater Management for Parcel-based Projects</li> <li>• Volume 1, Section 4.2.2 – On-site Stormwater Management for Trail and Sidewalk Projects</li> <li>• Volume 1, Section 4.3.2 – On-site Stormwater Management for Roadway Projects</li> <li>• Volume 1, Section 5.2.1 (SMC, Section 22.805.070.C) – On-site Performance Standard</li> <li>• Volume 1, Section 5.2.2 (SMC, Section 22.805.070.D) – On-site Lists</li> <li>• Volume 3, Section 3.3 – BMP Selection for On-site Stormwater Management</li> <li>• Volume 3, Section 4.1.1 – Sizing Approach - On-site List</li> <li>• Appendix C – On-site List Infeasibility Criteria</li> </ul>

Projects triggering this minimum requirement must evaluate on-site stormwater management to meet the applicable design requirements for the given project type, size, and discharge location as summarized in *Chapter 2*. Two approaches that can be used for evaluating Minimum Requirements for On-site Stormwater Management include:

- On-site Performance Standard per *Section 5.2.1*
- On-site Lists per *Section 5.2.2*

### **5.2.1. On-site Performance Standard**

<b>Stormwater Code Language</b>
<p>SMC, 22.805.070.C – <i>On-site performance standard:</i></p> <ol style="list-style-type: none"> <li>1. <i>If the existing hard surface coverage is less than 35 percent and the project discharges to a listed creek, or to the drainage basin of such creek:</i> <ol style="list-style-type: none"> <li>a. <i>The post-development discharge durations shall match the discharge durations of a pre-developed forested condition for the range of pre-developed discharge rates from 8 percent of the 2-year peak flow to 50 percent of the 2-year peak flow.</i></li> </ol> </li> <li>2. <i>For all other projects:</i> <ol style="list-style-type: none"> <li>a. <i>The post-development discharge durations shall match the discharge durations of a pre-developed pasture condition for the range of pre-developed discharge rates between the 1 percent and 10 percent exceedance values.</i></li> </ol> </li> </ol>

### References

- Volume 3, Section 3.3.2 – On-site Performance Standard Approach
- Volume 3, Section 4.1.3 – Modeling Approach
- Appendix F – Hydrologic Analysis and Design

Refer to *Volume 3, Section 3.3.2* and *Appendix F, Section F-4*, subsection “On-site Performance Standard BMP Design” for guidance about applying the performance standard.

## 5.2.2. *On-site Lists*

### Stormwater Code Language

SMC, 22.805.070.D – *On-site lists*

1. *For each project surface, follow the appropriate project table in this subsection 22.805.070.D to evaluate on-site BMPs shown for that type of surface, by category. The project tables apply to roofs and other hard (non-roof) surfaces. All on-site BMPs used must comply with the rules promulgated by the Director. For each surface, consider all the applicable on-site BMPs in the first category. Use any that is considered feasible. If none is feasible for that surface, move on to each successive category and repeat the selection process as necessary. Once one on-site BMP is used for a surface, no other on-site BMP is necessary for that surface. If no BMP in the appropriate categories is feasible, then no further evaluation is required for that surface under this subsection 22.805.070.D.1. Feasibility shall be determined by evaluation against:*
  - a. *Design criteria, minimum size, limitations, and infeasibility criteria identified for each BMP in this subsection 22.805.070.D and the rules promulgated by the Director; and*
  - b. *Competing needs. This subsection 22.805.070.D may be superseded or reduced by the Director if the installation of the BMPs is in conflict with:*
    - 1) *Any of the following federal or state laws, rules, and standards, as may be amended or superseded: Historic Preservation and Archaeology Laws identified in subsection 22.805.070.E (Historic preservation and archaeology laws), Federal Superfund or Washington State Model Toxics Control Act, Federal Aviation Administration requirements for airports, the Americans with Disabilities Act, and related rules and standards; or*
    - 2) *Special zoning district design criteria adopted and being implemented pursuant to a community planning process. Special zoning districts include, for example, historic and preservation districts, pedestrian zone overlays, station area overlays, special review districts, multifamily residential zones, urban centers and urban villages, and master planned communities. Specific criteria in these areas include, but are not limited to, minimum Floor Area Ratio standards; zero lot line development; usable open space requirements; minimum sidewalk width and required bicycle facilities; alley, loading, and access requirements; pitched roof standards; and street-level development standards for modulation and projections; or*
    - 3) *Public health and safety standards; or*
    - 4) *Transportation regulations to maintain the option for future expansion or multi-modal use of public rights-of-way; or*
    - 5) *Chapter 15.43 (Tree and Vegetation Management in Public Places); Chapter 25.09 (Regulations for Environmentally Critical Areas); Chapter 25.11 (Tree Protection); and Chapter 23.60A (Standards for Vegetation in the Shoreline Master Plan).*
2. *For parcel-based projects, Table A for 22.805.070 applies.*
3. *For trail and sidewalk projects, Table B for 22.805.070 applies.*
4. *For roadway projects, Table C for 22.805.070 applies.*

**References**

- Volume 1, Section 5.2.2.1 – Parcel-based Projects On-site List
- Volume 1, Section 5.2.2.2 – Trail and Sidewalk Projects On-site List
- Volume 1, Section 5.2.2.3 – Roadway Projects On-site List
- Volume 3, Section 3.3.1 – On-site List Approach
- Volume 3, Section 4.1.1 – On-site List Approach
- Appendix C – On-site List Infeasibility Criteria

### 5.2.2.1. Parcel-based Projects

**Table A for 22.805.070 On-site List for Parcel-based Projects**

Category	BMPs	Projects Discharging to a Receiving Water Not Designated by Section 22.801.050, Public Combined Sewer, or Capacity-constrained System, or its Basin	Projects Discharging to a Designated Receiving Water or its Basin
1	Full Dispersion	R, S	R, S
	Infiltration Trenches	R, S <sup>g</sup>	R, S <sup>g</sup>
	Drywells	R, S <sup>g</sup>	R, S <sup>g</sup>
	Rainwater Harvesting—Category 1 Sizing	X <sup>e</sup>	X <sup>e</sup>
2	Rain Gardens With or Without Tree	R <sup>a</sup> , S <sup>a</sup>	R <sup>a</sup> , S <sup>a</sup>
	Infiltrating Bioretention With or Without Tree	R, S	R, S
	Infiltrating Soil Cell Bioretention With Tree	X	X
	Permeable Pavement Facilities or approved equivalent	R, S	R, S
	Permeable Pavement Surfaces or approved equivalent <sup>h</sup>	S	S
	Sidewalk/Trail Compost-Amended Strip <sup>h</sup>	S	S
3	Infiltrating Soil Cell Bioretention Without Tree	X	X
	Sheet Flow Dispersion	R, S	R, S
	Concentrated Flow Dispersion	S	S
	Splashblock Downspout Dispersion	R	R
	Trench Downspout Dispersion	R	R
4	Non-infiltrating Bioretention	R <sup>d</sup> , S <sup>d</sup>	R <sup>d</sup> , S <sup>d</sup>
	Non-Infiltrating Soil Cell Bioretention With Tree	X	X
	Rainwater Harvesting—Category 4 Sizing	R <sup>b, f</sup>	X <sup>f</sup>
	Vegetated Roofs	R <sup>c</sup>	R <sup>c</sup>
	Residential Cistern	X	X
5	Perforated Stub-out Connections	R	R
	Trees	S	S

Note that subsection 22.805.070.D.1 requires consideration of all on-site BMPs in a category for feasibility before moving on to each successive category as necessary. Within a category, BMPs may be considered in any order.

#### Key to Table C for 22.805.070

R = Evaluation is required for all roof runoff from parcel-based projects.

S = Evaluation is required for all other hard (non-roof) surfaces of parcel-based projects, unless otherwise noted below.

X = Evaluation is not required but is allowed.

<sup>a</sup> Rain gardens cannot be used to meet Section 22.805.080 (Minimum Requirements for Flow Control) or Section 22.805.090 (Minimum Requirements for Treatment) or for areas of 5,000 square feet or more hard surface infiltrating on the project site.

<sup>b</sup> Evaluation is not required for projects with less than 20,000 square feet of new plus replaced rooftop surface.

<sup>c</sup> Evaluation is not required for projects with less than 5,000 square feet of new plus replaced rooftop surface.

<sup>d</sup> Water quality treatment BMPs sized to meet Section 22.805.090 (Minimum Requirements for Treatment) may be installed in lieu of non-infiltrating bioretention unless the project discharges to a public combined sewer basin.

<sup>e</sup> Category 1 rainwater harvesting shall be sized to meet the on-site performance standard, subsection 22.805.070.C.

<sup>f</sup> Category 4 rainwater harvesting shall be sized to reduce the runoff volume by 25 percent or more on an annual average basis.

<sup>g</sup> Evaluation of other hard (non-roof) surfaces is not required but is allowed.

<sup>h</sup> Infiltration testing is not required to use for the on-site list approach; it is only necessary to prove infeasibility.

### 5.2.2.2. Trail and Sidewalk Projects

Table B for 22.805.070 On-site List for Trail and Sidewalk Projects

Category	BMPs	Projects Discharging to a Receiving Water Not Designated by Section 22.801.050, or its Basin	Projects Discharging to a Public Combined Sewer or Capacity-constrained System, <sup>c</sup> or its Basin	Projects Discharging to a Designated Receiving Water, or its Basin
1	Full Dispersion	S	S	S
2	Rain Gardens With or Without Tree	S	S	X
	Infiltrating Soil Cell Bioretention With Tree <sup>d</sup>	X	X	X
	Permeable Pavement Facilities	X	X <sup>a</sup>	X <sup>a, b</sup>
	Permeable Pavement Surfaces <sup>e</sup>	S	S <sup>a</sup>	X <sup>a, b</sup>
	Sidewalk/Trail Compost-Amended Strip <sup>e</sup>	S	S	X
3	Sheet Flow Dispersion	S	S	S
	Concentrated Flow Dispersion	S	S	S
4	Trees	S	S	S

Note that subsection 22.805.070.D.1 requires consideration of all on-site BMPs in a category for feasibility before moving on to each successive category as necessary. Within a category, BMPs may be considered in any order.

**Key to Table B for 22.805.070**

S = Evaluation is required for all surfaces of trail or sidewalk projects.

X = Evaluation is not required for trail or sidewalk projects.

<sup>a</sup> Minimum permeable pavement area allowed in right-of-way is 2,000 square feet of pavement within the project site.

<sup>b</sup> Installation is not allowed in the right-of-way if new plus replaced pollution-generating hard surface area is less than 2,000 square feet of pavement within the project site

<sup>c</sup> Does not include any project discharging to a receiving water not designated by Section 22.801.050, or its basin, even if the project discharges to a capacity-constrained system or its basin.

<sup>d</sup> Tree is required unless considered infeasible per rules promulgated by the Director.

<sup>e</sup> Infiltration testing is not required to use for the on-site list approach, it is only necessary to prove infeasibility.

### 5.2.2.3. Roadway Projects

Category	BMPs	Projects Discharging to a Receiving Water Not Designated by Section 22.801.050, or its Basin	Projects Discharging to a Public Combined Sewer or Capacity-constrained System, <sup>g</sup> or its Basin	Projects Discharging to a Designated Receiving Water or its Basin
1	Full Dispersion	S	S	S
2	Rain Gardens With Tree <sup>h</sup>	S <sup>a</sup>	S <sup>a</sup>	S <sup>a</sup>
	Infiltrating Bioretention With Tree <sup>h</sup>	S	S <sup>b</sup>	S <sup>b, c</sup>
	Infiltrating Soil Cell Bioretention With Tree <sup>h</sup>	X	X	X
	Permeable Pavement Facilities	X <sup>d</sup>	X <sup>e, f</sup>	X <sup>c, e, f</sup>
	Permeable Pavement Surfaces <sup>i</sup>	S <sup>d</sup>	S <sup>e, f</sup>	X <sup>c, e, f</sup>
	Sidewalk/Trail Compost-Amended Strip <sup>l</sup>	S <sup>e</sup>	S <sup>e</sup>	S <sup>e</sup>
3	Sheet Flow Dispersion	S	S	S
	Concentrated Flow Dispersion	S	S	S
4	Trees	S	S	S
	Non-Infiltrating Soil Cell Bioretention With Tree <sup>h</sup>	X	X	X

Note that subsection 22.805.070.D.1 requires consideration of all on-site BMPs in a category for feasibility before moving on to each successive category as necessary. Within a category, BMPs may be considered in any order.

#### Key to Table C for 22.805.070

S = Evaluation is required for all surfaces of Roadway Projects.

X = Evaluation is not required for Roadway Projects, but is allowed.

<sup>a</sup> Rain gardens cannot be used to meet Section 22.805.080 (Minimum Requirements for Flow Control) or Section 22.805.090 (Minimum Requirements for Treatment) or for projects with areas of 5,000 square feet or more hard surface infiltrating on the project site.

<sup>b</sup> Minimum bioretention cell size top area in right-of-way is 500 square feet (including pre-settling area). Evaluation is only required and installation only allowed when contributing area is sufficient to warrant minimum bioretention cell size in right-of-way.

<sup>c</sup> Evaluation is not required, and installation is not allowed, if new plus replaced pollution-generating hard surface is less than 2,000 square feet.

<sup>d</sup> Evaluation of roadway surfaces is not required, and installation is not allowed, if roadway is an arterial street/collector.

<sup>e</sup> Evaluation of roadway surfaces, including alleys, is not required and installation is not allowed.

<sup>f</sup> Minimum permeable pavement area allowed in right-of-way is 2,000 square feet of pavement within the project site.

<sup>g</sup> Does not include any project discharging to a receiving water not designated by Section 22.801.050, or its basin, even if the project discharges to a capacity-constrained system or its basin.

<sup>h</sup> Tree is required unless considered infeasible per rules promulgated by the Director.

<sup>i</sup> Infiltration testing is not required to use for the on-site list approach; it is only necessary to prove infeasibility.

### 5.3. Flow Control

Projects triggering this minimum requirement must install flow control BMPs meeting the applicable design requirements for the given project type, size, and discharge location as summarized in *Chapter 2*. General flow control requirements included in SMC, Section 22.805.080 are summarized below. Refer to *Sections 5.3.1* through *5.3.5* for specific flow control standards for wetland protection, pre-developed forested, pre-developed pasture, existing condition, and peak control.

<b>Stormwater Code Language</b>
<p>SMC, 22.805.080 – <i>Minimum requirements for flow control</i></p> <p>A. <i>Applicability. The requirements of this Section 22.805.080 apply to the extent required in Section 22.805.050 to Section 22.805.060.</i></p> <p>B. <i>Requirements. Flow control facilities shall be installed to the extent allowed by law and maintained pursuant to rules promulgated by the Director to receive flows from that portion of the site being developed. Post-development discharge determination must include flows from dewatering activities. All projects shall use on-site BMPs identified in subsection 22.805.070.D or other infiltration BMPs authorized by rule to the maximum extent feasible to meet the minimum requirements. Flow control facilities that receive flows from less than that portion of the site being developed may be installed if the total new plus replaced impervious surface is less than 10,000 square feet, the project site uses only on-site BMPs to meet the requirement, and the on-site BMPs provide substantially equivalent environmental protection as facilities not using on-site BMPs that receive flows from all of the portion of the site being developed.</i></p>
<b>References</b>
<ul style="list-style-type: none"> <li>• Volume 1, Section 4.1.3 – Minimum Requirements for Flow Control for Parcel-based Projects</li> <li>• Volume 1, Section 4.3.3 – Minimum Requirements for Flow Control for Roadway Projects</li> <li>• Volume 1, Section 5.2.2 (SMC 22.805.070.D) – On-site Lists</li> <li>• Volume 1, Section 5.3.1 – Wetland Protection Standards</li> <li>• Volume 1, Section 5.3.2 – Pre-developed Forested Standard</li> <li>• Volume 1, Section 5.3.3 – Pre-developed Pasture Standard</li> <li>• Volume 1, Section 5.3.4 – Existing Condition Standard</li> <li>• Volume 1, Section 5.3.5 – Peak Control Standard</li> <li>• Volume 3, Section 4.1.3 – Modeling Approach</li> <li>• Volume 3, Section 4.4 – Presettling and Pretreatment Requirements</li> <li>• Volume 3, Section 5.4 – Infiltration BMPs</li> </ul>

**Note:**

- If a project requires compliance with the Peak Control Standard and either the Pre-developed Forested or Pre-developed Pasture Standard apply, the BMP must be sized to meet both standards unless otherwise allowed using the Pre-sized Approach (refer to *Volume 3, Section 4.1.2*).
- Projects with 35 percent or greater existing hard surface may manage a smaller portion of the project’s new and replaced hard surface area to meet flow control requirements if only On-site BMPs are employed.

- Specifically, if flow control is required and only On-site BMPs are used, the hard surface area requiring management may be reduced by up to 2,000 square feet if On-site BMPs are used to the maximum extent feasible per 22.805.080.B.
- When off-site flows cannot feasibly bypass proposed flow control BMPs, the flow control BMPs must be modeled and sized to handle the combined total flow (refer to *Volume 3, Section 4.2.2*).
- Flow control BMPs are not required if the site fully infiltrates all flows as determined by a licensed civil engineer using an approved continuous runoff model for the 158-year simulation period (refer to *Appendix F*).
- The Flow Control Standards are applied to the full project site. Stormwater modeling must account for runoff from all hard surfaces and pervious surfaces within the project site. Refer to *Volume 3, Section 4.2.3* for guidance about runoff from the site that bypasses the flow control BMP.
- For detention BMPs, the minimum bottom orifice diameter (i.e., 0.5 inches for underground detention BMPs) will be too large to meet standard release rates in some scenarios, even with minimal head. Refer to *Volume 3, Section 4.1.3.2* for sizing guidance when this occurs.

### 5.3.1. Wetland Protection Standards

<b>Stormwater Code Language</b>
<p>SMC, 22.805.080.C – <i>Wetland protection standards</i></p> <ol style="list-style-type: none"> <li>1. <i>Protect the functions and values of wetlands and their buffers from all projects discharging stormwater directly or indirectly to them. The hydrologic conditions, vegetative community, and substrate characteristics of the wetlands shall be protected, and impacts caused by changes in water flows and pollutants shall be prevented. The introduction of sediment, heat, and other pollutants and contaminants into wetlands shall be minimized through the selection, design, installation, and maintenance of temporary and permanent controls.</i></li> <li>2. <i>Before authorizing new discharges to a wetland, alternative discharge locations shall be evaluated and infiltration options outside the wetland shall be maximized unless doing so will adversely impact the functions and values of the affected wetlands.</i></li> <li>3. <i>If the wetland protection standard cannot be met due to Sections 22.805.070 or 22.805.090, the wetland protection standard shall be met to the maximum extent feasible while fully meeting the on-site stormwater management and water quality treatment requirements, unless an analysis by a wetland professional per rules promulgated under subsection 25.09.330.C (Technical Reports) is conducted that demonstrates that the functions and values of the affected wetland are not protected.</i></li> <li>4. <i>If one or more of the flow control requirements contained in subsections 22.805.080.D through 22.805.080.F also applies to the project, the wetland standard must be met to ensure that the functions and values of the affected wetland are protected before implementing these flow control requirements to the full extent.</i></li> <li>5. <i>Notwithstanding any provision in this subtitle, no net loss of wetland functions or values shall result from actions regulated by this subtitle.</i></li> <li>6. <i>Refer to the Washington State Wetland Rating System for Western Washington: 2014 Update, Version 2.0 (Hruby, 2023) to determine the category, characteristics, and habitat score of the wetland. Wetland classification shall be determined by a wetland professional per rules promulgated under subsection 25.09.330.C (Technical reports).</i></li> </ol>

### Stormwater Code Language

7. *Projects triggering Method 1 or Method 2 in this subsection 22.805.080.C shall refer to I-C.4, Wetland Hydroperiod Protection and I-C-5, Wetland Hydroperiod Data Collection, Evaluation Procedures, and Strategies presented in Appendix I-C of Ecology’s Stormwater Management Manual for Western Washington (Ecology 2024) for additional guidance.*
8. *Comply with subsection 22.805.080.C.10 (Wetland Protection Standard—Method 1: Monitoring and Wetland Stage Modeling) if the following applies:*
  - a. *The project discharges to a Category I or II depressional or riverine impounding wetland; and*
  - b. *The project owner has legal access to the entire wetland for purposes of conducting monitoring in the wetland.*
9. *Comply with subsection 22.805.080.C.11 (Wetland Protection Standard—Method 2: Site Discharge Modeling) if the criteria in subsection 22.805.080.C.8 do not apply and one or more of the following applies (or applicability is unknown):*
  - a. *The wetland is Class I or II and does not meet the requirements of subsection 22.805.080.C.8.*
  - b. *The wetland is Class III or IV and:*
    - 1) *Has a habitat score greater than 5;*
    - 2) *Is interdunal and has special characteristics;*
    - 3) *Provides habitat for rare, threatened, endangered, or sensitive species; or*
    - 4) *Contains breeding population of any native amphibian. Per Ecology’s guidance, wetlands with permanent or seasonal ponding or inundation are assumed to have breeding population of native amphibian.*
10. *Wetland Protection Standard—Method 1: Monitoring and Wetland Stage Modeling. Comply with I-C.4, Wetland Hydroperiod Protection, presented in Appendix I-C of Ecology’s Stormwater Management Manual for Western Washington (Ecology 2024).*
11. *Wetland Protection Standard—Method 2: Site Discharge Modeling. The total volume of stormwater discharging from the project site into a wetland shall not be more than:*
  - a. *On a daily basis, 20 percent higher or lower than the pre-project volume, and*
  - b. *On a monthly basis,*
    - 1) *20 percent higher or lower than the pre-project volumes for the months of October, November, and December, and*
    - 2) *15 percent higher or lower than the pre-project volumes for all other months (January through September).*

### References

- Volume 1, Section 3.5 – Protect Wetlands
- Volume 1, Section 5.3 - Flow Control
- Volume 1, Section 5.3.2 (SMC, Section 22.805.080.D) – Pre-developed Forested Standard
- Volume 1, Section 5.3.3 (SMC, Section 22.805.080.E) – Pre-developed Pasture Standard
- Volume 1, Section 5.3.4 (SMC, Section 22.805.080.F) – Existing Condition Standard
- Volume 1, Section 5.3.5 (SMC, Section 22.805.080.G) – Peak Control Standard
- Volume 3, Section 3.4 – BMP Selection for Flow Control
- SWMMWW Volume I, Appendix I-C (Ecology 2024)

**Note:**

- In some cases, other requirements (e.g., on-site stormwater management, flow control, water quality) may also apply when the Wetland Protection Standard applies. To ensure that the functions and values of the wetland are protected in these cases, the designer must attempt to meet all applicable requirements. If the designer is unable to meet all flow control standards, then the requirement to maintain the hydroperiod of the wetland becomes the overriding concern and the designer must show compliance with this Wetland Protection Standard unless a wetland professional demonstrates that values and functions the wetland are maintained. If this is the case, the designer must also provide documentation detailing why they are unable to meet the requirements of the other flow control standards. If the Wetland Protection Standard cannot be fully met due to the implementation of required on-site stormwater management or water quality BMPs, then the designer must attempt to meet the Wetland Protection Standard to the maximum extent feasible, while still meeting the on-site stormwater management and water quality standards, then consult with a wetland professional to demonstrate that the values and functions of the wetland are maintained.
- Refer to the Summer Months Allowable Exception for Method 2 Wetland Hydroperiod Protection in Ecology’s SWMMWW Volume 1, Appendix 1-C for an alternative option if the project cannot meet the monthly basis criteria during July, August, and September.

### 5.3.2. *Pre-developed Forested Standard*

<b>Stormwater Code Language</b>
SMC, 22.805.080.D – <i>Pre-developed forested standard. The post-development discharge durations from the project site shall match the discharge durations of a pre-developed forested condition for the range of pre-developed discharge rates from 50 percent of the 2-year peak flow to the 50-year peak flow.</i>
<b>References</b>
<ul style="list-style-type: none"> <li>• Volume 1, Section 5.3 - Flow Control</li> <li>• Volume 3, Section 3.4 – BMP Selection for Flow Control</li> <li>• Volume 3, Section 4.1 – Sizing Approach</li> <li>• Appendix F – Hydrologic Analysis and Design</li> </ul>

### 5.3.3. *Pre-developed Pasture Standard*

<b>Stormwater Code Language</b>
SMC, 22.805.080.E – <i>Pre-developed pasture standard. The post-development discharge durations from the project site shall match the discharge durations of a pre-developed pasture condition for the range of pre-developed discharge rates from 50 percent of the 2-year peak flow to the 2-year peak flow.</i>

<b>References</b>
<ul style="list-style-type: none"> <li>• Volume 1, Section 5.3 - Flow Control</li> <li>• Volume 3, Section 3.4 – BMP Selection for Flow Control</li> <li>• Volume 3, Section 4.1 – Sizing Approach</li> <li>• Appendix F – Hydrologic Analysis and Design</li> </ul>

### **5.3.4. Existing Condition Standard**

<b>Stormwater Code Language</b>
<p>SMC, 22.805.080.F – <i>Existing condition standard. The post-development discharge durations from the project site shall be limited as follows:</i></p> <ol style="list-style-type: none"> <li>1. <i>Match the discharge durations of the existing land cover condition for the range of discharge rates from 50 percent of the 2-year peak flow to the 25-year peak flow; and</i></li> <li>2. <i>For discharges to a creek or a creek drainage basin or to a small lake or a small lake basin, also match the discharge durations of the existing land cover condition for the range of discharge rates from 50 percent of the 2-year peak flow to the 50-year peak flow.</i></li> </ol>
<b>References</b>
<ul style="list-style-type: none"> <li>• Volume 1, Section 5.3 - Flow Control</li> <li>• Volume 3, Section 3.4 – BMP Selection for Flow Control</li> <li>• Volume 3, Section 4.1 – Sizing Approach</li> <li>• Appendix F – Hydrologic Analysis and Design</li> </ul>

Existing land cover condition means the existing grade, drainage systems, vegetation, hard surface, land cover, and soils that exist at a site prior to any changes associated with achieving the proposed development conditions. Approved permits and engineering plans may be required. Existing land cover conditions may be verified using aerial photography or other records.

### **5.3.5. Peak Control Standard**

<b>Stormwater Code Language</b>
<p>SMC, 22.805.080.G – <i>Peak control standard. The post-development release rates from the project site shall be limited as follows:</i></p> <ol style="list-style-type: none"> <li>1. <i>The peak flow with a 50 percent annual probability (2-year recurrence flow) shall not exceed 0.07 cubic feet per second per acre;</i></li> <li>2. <i>The peak flow with a 20 percent annual probability (5-year recurrence flow) shall not exceed 0.10 cubic feet per second per acre; and</i></li> <li>3. <i>The peak flow with a 4 percent annual probability (25-year recurrence flow) shall not exceed 0.40 cubic feet per second per acre.</i></li> </ol>

**References**

- Volume 1, Section 5.3 - Flow Control
- Volume 3, Section 3.4 – BMP Selection for Flow Control
- Volume 3, Section 4.1 – Sizing Approach
- Appendix F – Hydrologic Analysis and Design

Note: The post-development release rates for the Peak Control Standard are based on the full project site. Calculate the allowable release rates using the full project site and include the full project site in the continuous runoff model, including both the pervious and the hard surfaces.

## 5.4. Water Quality Treatment

Projects triggering this minimum requirement based on the amount of pollution-generating surface must install water quality treatment BMPs, which typically remove pollutants through a combination of gravity settling, filtration, biological uptake, and soil adsorption. General water quality treatment requirements included in SMC, Section 22.805.090 are summarized below.

Note:

- Projects with 35 percent or greater existing hard surface may manage a smaller portion of the project’s new and replaced hard surface area to meet water quality treatment requirements if only On-site BMPs are employed. Specifically, if water quality treatment is required and only On-site BMPs are used, the hard surface area requiring management may be reduced by up to 2,000 square feet if On-site BMPs are used to the maximum extent feasible.
- An approved landscape management plan (LMP) can be used as an alternative to the requirement to formally treat (with a water quality treatment BMP) the runoff from pollution-generating pervious surfaces subject to water quality treatment. An LMP is a City-approved plan for defining the layout and long-term maintenance of landscaping features to minimize the use of pesticides and fertilizers, and reduce the discharge of suspended solids and other pollutants. Runoff from a hard surface area that is routed to a pervious area is not included in an LMP and must be addressed separately through applying Minimum Requirements #5, #6, #7, or some combination. LMPs do not apply to artificial turf fields because pesticides and fertilizers are not the associated pollutants of concern. LMPs must be updated if the layout of landscaping features will be substantially modified or if specific maintenance approaches will be altered from the approved LMP. Refer to *Appendix I* for LMP submittal requirements.
- Refer to *Volume 3, Section 4.4* for applicable presettling and pretreatment requirements.

<b>Stormwater Code Language</b>
<p>SMC, 22.805.090 – <i>Minimum requirements for treatment</i></p> <p>A. <i>Applicability. The requirements of this Section 22.805.090 apply to the extent required in Section 22.805.050 to Section 22.805.060.</i></p> <p>B. <i>Requirements. Water quality treatment facilities shall be installed to the extent allowed by law and maintained pursuant to rules promulgated by the Director to treat flows from the pollution-generating pervious and hard surfaces on the site being developed. When stormwater flows from other areas, including non-pollution generating surfaces (e.g., roofs), dewatering activities, and off-site areas, cannot be separated or bypassed, treatment BMPs shall be designed for the entire area draining to the treatment facility. All projects shall use on-site BMPs identified in subsection 22.805.070.D, or other infiltration BMPs authorized by rule, to the maximum extent feasible to meet the minimum requirements. For pollution-generating pervious surfaces other than artificial turf, a landscape management plan developed according to rules promulgated by the Director may be utilized in lieu of installing water quality treatment facilities.</i></p>

<b>References</b>
<ul style="list-style-type: none"> <li>• Volume 1, Section 4.1.4 – Treatment Requirements for Parcel-based Projects</li> <li>• Volume 1, Section 4.3.4 – Treatment Requirements for Roadway Projects</li> <li>• Volume 1, Section 5.2.2 (SMC 22.805.070.D) – On-site Lists</li> <li>• Volume 1, Section 5.4.1.1 – Runoff Treatment Volume</li> <li>• Volume 1, Section 5.4.1.2 – Runoff Treatment Rates</li> <li>• Volume 1, Section 5.4.1.3 – Infiltration Treatment Requirements</li> <li>• Volume 1, Section 5.4.2 – Water Quality Treatment Standards</li> <li>• Volume 3, Section 4.1.3 – Modeling Approach</li> <li>• Volume 3, Section 4.4 – Presettling and Pretreatment Requirements</li> <li>• Volume 3, Section 5.4 – Infiltration BMPs</li> </ul>

Water quality treatment BMPs must be designed based on the stormwater runoff volume from the contributing area or a peak flow rate as outlined in the following subsections.

### **5.4.1. General Water Quality Treatment Requirements**

#### **5.4.1.1. Runoff Treatment Volume**

The water quality design treatment volume is determined as follows:

<b>Stormwater Code Language</b>
<p>SMC, 22.805.090.B.1.a – <i>The daily runoff volume at or below which 91 percent of the total runoff volume for the simulation period occurs, as determined using an approved continuous model. It is calculated as follows:</i></p> <ol style="list-style-type: none"> <li>1) <i>Rank the daily runoff volumes from highest to lowest.</i></li> <li>2) <i>Sum all the daily volumes and multiply by 0.09.</i></li> <li>3) <i>Sequentially sum daily runoff volumes, starting with the highest value, until the total equals 9 percent of the total runoff volume. The last daily value added to the sum is defined as the water quality design volume.</i></li> </ol>
<b>References</b>
<ul style="list-style-type: none"> <li>• Volume 1, Section 5.4 – Water Quality Treatment</li> <li>• Volume 1, Section 5.4.1.3 – Infiltration Treatment Requirements</li> <li>• Volume 3, Section 4.1 – Sizing Approach</li> <li>• Appendix F – Hydrologic Analysis and Design</li> </ul>

#### **5.4.1.2. Runoff Treatment Rates**

<b>Stormwater Code Language</b>
<p>SMC, 22.805.090.B.1.b – <i>Different design flow rates are required depending on whether a treatment facility will be located upstream or downstream of a detention facility:</i></p> <ol style="list-style-type: none"> <li>1) <i>For facilities located upstream of detention or when detention is not required, the design flow rate is the flow rate at or below which 91 percent of the total runoff volume for the simulation period is treated, as determined using an approved continuous runoff model.</i></li> <li>2) <i>For facilities located downstream of detention, the design flow rate shall be the full 2-year release rate, as determined using an approved continuous runoff model.</i></li> </ol>

<b>References</b>
<ul style="list-style-type: none"> <li>• Volume 1, Section 5.4 – Water Quality Treatment</li> <li>• Volume 3, Section 4.1 – Sizing Approach</li> <li>• Appendix F – Hydrologic Analysis and Design</li> </ul>

### 5.4.1.3. *Infiltration Treatment Requirements*

<b>Stormwater Code Language</b>
<p>SMC 22.805.090.B.1.c – <i>Infiltration facilities designed for water quality treatment must infiltrate 91 percent of the total runoff volume as determined using an approved continuous runoff model. To prevent the onset of anaerobic conditions, an infiltration facility designed for water quality treatment purposes must be designed to drain the water quality design treatment volume (the 91st percentile, 24-hour volume) within 48 hours.</i></p>
<b>References</b>
<ul style="list-style-type: none"> <li>• Volume 1, Section 5.4 – Water Quality Treatment</li> <li>• Volume 1, Section 5.4.1.1 – Runoff Treatment Volume</li> <li>• Volume 3, Section 4.1 – Sizing Approach</li> <li>• Volume 3, Section 4.4 – Presettling and Pretreatment Requirements</li> <li>• Appendix F – Hydrologic Analysis and Design</li> </ul>

Note that the “91st percentile, 24-hour volume” referenced above represents the upper limit of the range of daily volumes that accounts for 91 percent of the entire runoff volume over a multi-decade period of record.

### 5.4.2. *Water Quality Treatment Standards*

Projects triggering this minimum requirement must install water quality treatment BMPs for the given project type, size, and discharge location as summarized in *Chapter 2*. Refer to *Sections 5.4.2.1* through *5.4.2.4* for oil, phosphorus, metals, and basic water quality treatment standards.

When triggered, water quality treatment BMPs must be installed to treat flows from the pollution-generating hard surface (PGHS) and pollution-generating pervious surface (PGPS) on the site being developed. When stormwater flows from other areas, including non-PGHS (e.g., roofs), dewatering activities, and flows that cannot be separated or bypassed, water quality treatment BMPs must be sized for the combined total flow.

<b>Stormwater Code Language</b>
<p>SMC, 22.805.090.B.6 – <i>Discharges to groundwater. Direct discharge of untreated drainage water from pollution-generating hard surfaces to groundwater is prohibited.</i></p>
<b>References</b>
<ul style="list-style-type: none"> <li>• Volume 1, Section 5.4 – Water Quality Treatment</li> <li>• Volume 3, Section 4.5.2 – Soil Requirements for Water Quality Treatment</li> </ul>

### 5.4.2.1. Oil Control Treatment

Oil control treatment applies to projects that include “high-use sites” or have NPDES permits that require application of oil control. Oil control treatment is in addition to other water quality treatment requirements (i.e., phosphorus, metals, or basic). The petroleum storage and transfer standard is intended to address regular transfer operations such as gasoline service stations.

The project proponent must develop an Average Daily Traffic (ADT) estimate for approval by the City (<http://data-seattlecitygis.opendata.arcgis.com/search?tags=transportation>). In addition to the typical sites outlined in the definition for a high-use site, the City may also require oil control treatment to be used on other sites that have the potential to generate high concentrations of oil or have oil handling activity.

<b>Stormwater Code Language</b>
SMC, 22.805.090.B.3 – <i>Oil control treatment. An oil control treatment facility is required for high-use sites, as defined in this subtitle.</i>
SMC, 22.801.090 – <i>"High-use sites" means sites that typically generate high concentrations of oil due to high traffic turnover or the frequent transfer of oil or other petroleum products. High-use sites include:</i> <ol style="list-style-type: none"> <li>1. <i>An area of a commercial or industrial site subject to an expected average daily traffic (ADT) count equal to or greater than 100 vehicles per 1,000 square feet of gross building area; 300 or more total trip ends per day; or both;</i></li> <li>2. <i>An area of a commercial or industrial site subject to petroleum storage and transfer in excess of 1,500 gallons per year, not including routinely delivered heating oil;</i></li> <li>3. <i>An area of a commercial or industrial site subject to parking, storage or maintenance of 25 or more vehicles that are over 10 tons gross weight (trucks, buses, trains, heavy equipment, etc.);</i></li> <li>4. <i>A road intersection with a measured ADT count of 25,000 vehicles or more on the main roadway and 15,000 vehicles or more on any intersecting roadway, excluding projects proposing primarily pedestrian or bicycle use improvements.</i></li> </ol>
<b>References</b>
<ul style="list-style-type: none"> <li>• Volume 3, Section 3.5 – BMP Selection for Water Quality Treatment</li> </ul>

### 5.4.2.2. Phosphorus Treatment

The requirement to provide phosphorus treatment is determined by the discharge location of the project. Phosphorus treatment is required for projects discharging stormwater to or infiltrating within 1/4 mile of a nutrient-critical receiving water or a tributary to that water. If the soil suitability criteria for infiltrating BMPs are met (refer to *Volume 3, Section 4.5.2*) and pre-settling is provided (refer to *Volume 3, Section 4.4*), then it is assumed that the phosphorus treatment performance goal is met.

At the time this Manual was developed, Green Lake was the only nutrient-critical receiving water determined to be impaired due to phosphorus contributed by stormwater. In the future, the City may designate additional waterbodies as nutrient-critical receiving water as defined by the SMC, Section 22.801.150. Refer to the SDCI website to determine if any

nutrient-critical receiving waters have been designated ([www.seattle.gov/sdci/codes/codes-we-enforce-\(a-z\)/stormwater-code](http://www.seattle.gov/sdci/codes/codes-we-enforce-(a-z)/stormwater-code)).

<b>Stormwater Code Language</b>
SMC, 22.805.090.B.4 – <i>Phosphorus treatment. A phosphorus treatment facility is required for projects discharging into nutrient-critical receiving waters.</i>
<b>References</b>
<ul style="list-style-type: none"> <li>• Volume 1, Section 2.3 – Identify the Receiving Water and Downstream Conveyance</li> <li>• Volume 1, Figure 2.5 – North End Creek and Small Lake Basins</li> <li>• Volume 3, Section 3.5 – BMP Selection for Water Quality Treatment</li> <li>• Volume 3, Section 4.4.3.2 – Pretreatment</li> </ul>

Project sites subject to the phosphorus treatment requirement could also be subject to the oil treatment and metals treatment requirements (*Section 5.4.2.1* and *Section 5.4.2.3*).

### 5.4.2.3. *Metals Treatment*

The requirement to provide metals treatment (previously known as enhanced treatment) is determined by the discharge location of the project and activities occurring on the project site. If the soil suitability criteria for infiltrating BMPs are met (refer to *Volume 3, Section 4.5.2*) and pre-settling is provided (refer to *Volume 3, Section 4.4*), then it is assumed that the metals treatment performance goal is met.

<b>Stormwater Code Language</b>
SMC, 22.805.090.B.5 – <i>Metals treatment. Except for landscaped areas (unless containing crumb rubber) and projects that discharge to a basic treatment receiving water, a metals treatment facility for reducing concentrations of dissolved metals is required for projects that discharge, directly or through conveyance systems, to fresh waters designated for aquatic life use or having an existing aquatic life use, or that use infiltration strictly for flow control (not treatment) and discharge within 1/4 mile of fresh waters designated for aquatic life use or having an existing aquatic life use, if the project meets one of the following criteria:</i>
<ol style="list-style-type: none"> <li>a. <i>For a parcel-based project, the project is industrial, is commercial, or proposes four or more dwelling units, or the site is subject to industrial activities.</i></li> <li>b. <i>For a roadway project, the site includes a road:</i> <ol style="list-style-type: none"> <li>1) <i>With an expected Annual Average Daily Traffic count of 7,500 or greater; or</i></li> <li>2) <i>That provides on-street parking for commercial or industrial areas.</i></li> </ol> </li> </ol>
<b>References</b>
<ul style="list-style-type: none"> <li>• Volume 1, Section 5.4.2.4 – Basic Treatment</li> <li>• Volume 3, Section 3.5 – BMP Selection for Water Quality Treatment</li> <li>• Volume 3, Section 4.4.3.2 – Pretreatment</li> </ul>

Note: Sites not considered residential, industrial, or road-related are considered commercial for the purposes of applying metals treatment requirements. Examples include fueling stations, transit facilities, parks, churches, schools, light rail guideways and tracks (both elevated and non-elevated), and other rail lines and railways.

Any portion of a project site (e.g., landscaped areas, including sports fields (unless containing crumb rubber)) that is identified as subject to basic treatment requirements only (*Section 5.4.2.4*) are not subject to metals treatment requirements.

Project sites subject to the metals treatment requirement could also be subject to the oil control treatment requirement (*Section 5.4.2.1*) and phosphorus treatment requirement (*Section 5.4.2.2*).

#### 5.4.2.4. Basic Treatment

Projects triggering water quality treatment must install, at a minimum, a BMP that meets the basic treatment requirements. The requirements for oil control treatment (which may also be required if the project includes “high-use sites”; refer to *Section 5.4.2.1*), phosphorus treatment, and metals treatment are in addition to the basic treatment requirement. If the soil suitability criteria for infiltrating BMPs are met (refer to *Volume 3, Section 4.5.2*) and pre-settling is provided (refer to *Volume 3, Section 4.4*), then it is assumed that the basic treatment performance goal is met.

<b>Stormwater Code Language</b>
SMC, 22.805.090.B.2 – <i>Basic treatment. A basic treatment facility is required for all projects. The requirements of subsection 22.805.090.B.3 (Oil control treatment), subsection 22.805.090.B.4 (Phosphorus treatment), and subsection 22.805.090.B.5 (Metals treatment) are in addition to this basic treatment requirement.</i>
<b>References</b>
<ul style="list-style-type: none"> <li>• Section 5.4.2.1 (SMC, Section 22.805.090.B.3) – Oil Control Treatment</li> <li>• Section 5.4.2.2 (SMC, Section 22.805.090.B.4) – Phosphorus Treatment</li> <li>• Section 5.4.2.3 (SMC, Section 22.805.090.B.5) – Metals Treatment</li> <li>• Volume 3, Section 3.5 – BMP Selection for Water Quality Treatment</li> <li>• Volume 3, Section 4.1 – Sizing Approach</li> <li>• Appendix F – Hydrologic Analysis and Design</li> </ul>

Project sites subject to the basic treatment requirement per SMC, Chapter 22.805 could also be subject to the oil control treatment requirement (*Section 5.4.2.1*). Areas that provide phosphorus treatment or metals treatment do NOT have to provide additional basic treatment BMPs to meet the basic treatment performance goal.

Basic treatment is required in the following circumstances:

- Project sites that discharge stormwater to the ground (i.e., via infiltration) UNLESS:
  - The soil suitability criteria for infiltration treatment are met (refer to *Volume 3, Section 4.5.2*) and pre-settling is provided (refer to *Volume 3, Section 4.4*), or
  - The project site uses infiltration strictly for flow control – not treatment, or
  - The project site is required to provide metals treatment (refer to *Section 5.4.2.3*).
- Project sites discharging directly (or indirectly through a drainage system) to a Basic Treatment Receiving Water.

**Stormwater Code Language**

SMC, Section 22.801.030 – *“Basic treatment receiving water*

1. *All marine waters, including Puget Sound;*
2. *Lake Union;*
3. *Lake Washington;*
4. *Ship Canal and bays between Lake Washington and Puget Sound; and*
5. *Duwamish River.*

- Project sites that drain to fresh waters or to waters tributary to fresh waters that are not designated for aquatic life use and that do not have an existing aquatic life use. As provided in Chapter 173-201A WAC, all surface waters of the State, including but not limited to wetlands, in or near the City are to be protected for designated aquatic life use. For the purposes of the Stormwater Code and this Manual, “fresh waters designated for aquatic life use” include at minimum fresh water wetlands, small lakes, creeks, and fresh water-designated receiving waters.
- Landscaped areas of industrial, commercial, and multifamily project sites per SMC, Subsection 22.805.090.B.5.

## CHAPTER 6 – Alternative Compliance

Alternative compliance in creek basins applies only within the City of Seattle.

<b>Stormwater Code Language</b>
<p>SMC, 22.800.080 <i>Authority</i></p> <p><i>E. The Director of SPU is authorized, to the extent allowed by law, to develop, review, or approve an Integrated Drainage Plan as an equivalent means of complying with the requirements of this subtitle, in which the developer of a project voluntarily enters into an agreement with the Director of SPU to implement an Integrated Drainage Plan that is specific to one or more sites where best management practices are employed such that the cumulative effect on the discharge from the site(s) to the same receiving water is the same or better than that which would be achieved by a less integrated, site-by-site implementation of best management practices.</i></p> <p><i>F. For projects that do not discharge to the combined sewer system, the Director of SPU is authorized, to the extent allowed by law, to enter into an agreement with the developer to allow a project's flow control, water quality treatment, on-site stormwater management, or wetland protection requirements to be met at an alternative location if the following conditions are met, or if another scenario is approved by Ecology:</i></p> <ol style="list-style-type: none"> <li><i>1. The developer enters the agreement voluntarily to contribute funds toward the construction of, or to construct, one or more drainage control facilities at an alternative location to mitigate the impacts to the same receiving water that have been identified as a consequence of the project; and</i></li> <li><i>2. The alternative location is for an equivalent area in terms of flow and pollution characteristics when compared with the project, as determined by the Director; and</i> <ol style="list-style-type: none"> <li><i>a. The site of the project has greater than or equal to 35 percent existing hard surface coverage and the project discharges to:</i> <ol style="list-style-type: none"> <li><i>1) A listed creek and the equivalent area is in-basin, which means that the equivalent area is on the same site as the project, the project is located within contributing area to the equivalent area, or the equivalent area discharges from the public drainage system to the receiving water at the same point as (or upstream of) the point where the project area discharges from the public drainage system to the same receiving water; or</i></li> <li><i>2) A receiving water other than a listed creek and the equivalent area discharges to the same receiving water as the project.</i></li> </ol> </li> </ol> </li> </ol> <p><i>G. For projects that discharge to the combined sewer system, the Director of SPU is authorized, to the extent allowed by law, to enter into an agreement with the developer to allow a project's flow control or on-site stormwater management requirements to be met at an alternative location if the developer enters the agreement voluntarily to contribute funds towards the construction of, or to construct, one or more drainage control facilities at an alternative location, determined by the Director, to mitigate the impacts that have been identified as a consequence of the project.</i></p>

When the consequences of the proposed development are from new hard surfaces, the mitigation should be provided at the same time as completion of the new surfaces. When the consequences of the proposed development are from replaced hard surfaces, there should be a construction plan and schedule that ensure the stormwater control BMP(s) mitigating the impacts are constructed within 5 years of the original development, which may be required by state law.



## CHAPTER 7 – Exemptions, Adjustments, and Exceptions

### 7.1. Exemptions

Exemptions are described in SMC, Subsection 22.800.040.A. Refer to *Volume 1, Sections 2.2.6-2.2.10* for additional information related to exemptions, including Utility, Pavement Maintenance, Remediation, Retrofit, and WSDOT project provisions.

### 7.2. Adjustments

<b>Stormwater Code Language</b>
<p>SMC, 22.800.040 <i>Exemptions, adjustments, and exceptions</i></p> <p><i>B. Adjustments</i></p> <ol style="list-style-type: none"> <li>1. <i>The Director may approve a request for adjustments to the requirements of this subtitle when the Director finds that:</i> <ol style="list-style-type: none"> <li><i>a. The adjustment provides substantially equivalent environmental protection; and</i></li> <li><i>b. The objectives of safety, function, environmental protection, and facility maintenance are met, based on sound engineering practices.</i></li> </ol> </li> <li>2. <i>During construction, the Director may require, or the applicant may request, that the construction of drainage control facilities and associated project designs be adjusted if physical conditions are discovered on the site that are inconsistent with the assumptions upon which the approval was based, including but not limited to unexpected soil and/or water conditions, weather generated problems, or changes in the design of the improved areas.</i></li> <li>3. <i>A request by the applicant for adjustments shall be submitted to the Director for approval prior to implementation. The request shall be in writing and shall provide facts substantiating the requirements of subsection 22.800.040.B.1 and, if made during construction, the factors in subsection 22.800.040.B.2. Any such modifications made during the construction of drainage control facilities shall be recorded on the final approved drainage control plan, a revised copy of which shall be filed by the Director.</i></li> </ol>

An adjustment request must be submitted as a separate, clearly labeled request for the Director’s review and decision.

The request must include enough technical information to show how the proposal meets the adjustment criteria in SMC, Subsection 22.800.040.B. The adjustment request and supporting analysis must also be included in the project drainage report.

#### Example Application

For example, the Director may approve an adjustment to allow the use of an existing water quality treatment facility that does not meet the mass loading ratio requirements of this Manual where the applicant demonstrates that:

1. The project is otherwise required to conduct monitoring and comply with benchmark requirements; and
2. The existing facility will provide substantially equivalent environmental protection compared to the minimum water quality treatment requirements applicable to the project.

## 7.3. Exceptions

Exceptions for criteria and protocol related to a request for an exception to the requirements of the Stormwater Code are described in SMC, Subsection 22.800.040.C. Note, the criteria for granting an exception are extremely limited and require public notice of the exception application and the Director’s decision.