Protecting Seattle's Waterways

Volume 1: Project Minimum Requirements

CITY OF SEATTLE
STORMWATER MANUAL

JANUARY 2016

Note:
Some pages in this document have been purposely skipped or blank pages inserted so that this document will copy correctly when duplexed.

With a publication of this size and complexity there will inevitably be errors that must be corrected and clarifications that are needed. There will also be new information and technological updates. The City intends to publish correction, updates, and new technical information on our Stormwater Code website (http://www.seattle.gov/dpd/codesrules/codes/stormwater/default.htm). The City will not use the website to make revisions in key policy areas – such as the thresholds and minimum requirements in Volume 1. Please check this site periodically for corrections and updates.

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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 2013–2018 Phase I National Pollutant Discharge Elimination System and State Waste Discharge General Permit for Discharges from Large and Medium Municipal Separate Storm Sewer Systems, modified effective January 16, 2015 (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 to meet the requirements contained in the Phase I NPDES Municipal Stormwater Permit, with reference to the *Stormwater Management Manual for Western Washington* (Ecology 2014).

The City's Stormwater Code is contained in the Seattle Municipal Code (SMC), Chapters 22.800 – 22.808. The Stormwater Code contains regulatory requirements that provide for and promote the health, safety, and welfare of the general public. The provisions of the Stormwater Code are designed to accomplish the following:

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 that will increase the rate of downcutting, stream bank 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 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.

7. To fulfill the responsibilities of the City as trustee of the environment for future generations.

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) promulgate rules that provide specific technical requirements, criteria, guidelines, and additional information. This Directors' Rule consists of a five-volume City Stormwater Manual and nine appendices.

At the time of publication of this rule, legislation was transmitted by the Mayor to the City Council that would abolish the Department of Planning and Development (DPD) and establish the SDCI. The purpose of SDCI is to administer City ordinances that regulate building construction, the use of land, and housing, and is anticipated to be effective January 4, 2016.

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 regarding 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 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 nine appendices:

- *Appendix A: Definitions* provides terminology for all five volumes of the Stormwater Manual.
- *Appendix B: Background Information on Chemical Treatment* provides supplemental information for Volume 2 (Construction Stormwater Control).
- *Appendix C: On-site Stormwater Management 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 Design Requirements and Plant Lists* includes additional design requirements for flow control structures, flow splitters, flow spreaders, level spreaders, pipe slope drains, outlet protection, facility liners, and geotextiles. *Appendix E* also includes plant lists for biofiltration swales, sand filters, and wet ponds.
- *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*: *Integrated Pest Management Plan* provides supplemental information for Volume 4 (Source Control).

1.3. Purpose of Volume 1

Volume 1 — Project Minimum Requirements describes and contains 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 Stormwater Manual and this volume.
- *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* summarizes site assessment and planning steps and key project components.
- *Chapter 8* summarizes the standard and comprehensive drainage review minimum submittal requirements.

CHAPTER 2 – DETERMINING MINIMUM REQUIREMENTS

Per the Stormwater Code (SMC, Section 22.801.170), "project" means "the addition or replacement of hard surface or the undertaking of land-disturbing activity on a site." A hard surface is defined as an impervious surface, a permeable pavement, or a vegetated roof. There are seven 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

Note that these seven steps are focused on determining applicable minimum requirements for on-site stormwater management, flow control, and water quality treatment specifically. These seven steps are described in further detail below. In addition to determining the applicable minimum requirements, all projects shall also review and comply with all other Stormwater Code requirements, in particular the Minimum Requirements for All Discharges and All Real Property (SMC, Section 22.803) and the Minimum Requirements for All Projects (SMC, Section 22.805).

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

The boundaries of the project site shall contain the discharge point, all land-disturbing activities, and all new and replaced hard surfaces. 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. Defining project boundaries will help identify the project type(s) in Step 2.

2.2. Step 2 – Identify the Type of Project

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

1. A **single-family residential (SFR) project** (Figure 2.1) is defined in the Stormwater Code (SMC, Section 22.801.200) as:
   - A project that constructs one single-family dwelling unit located in land classified as being Single-family Residential 9,600 (SF 9600), Single-family Residential 7,200 (SF 7200), or Single-family Residential 5,000 (SF 5000) pursuant to SMC, Section 23.30.010,
   - The total new plus replaced hard surface is less than 10,000 square feet, and
   - The total new plus replaced pollution-generating hard surface (PGHS) is less than 5,000 square feet.

   Note that projects with 10,000 square feet or more of new plus replaced hard surface, or more than 5,000 square feet of PGHS, are considered parcel-based projects.

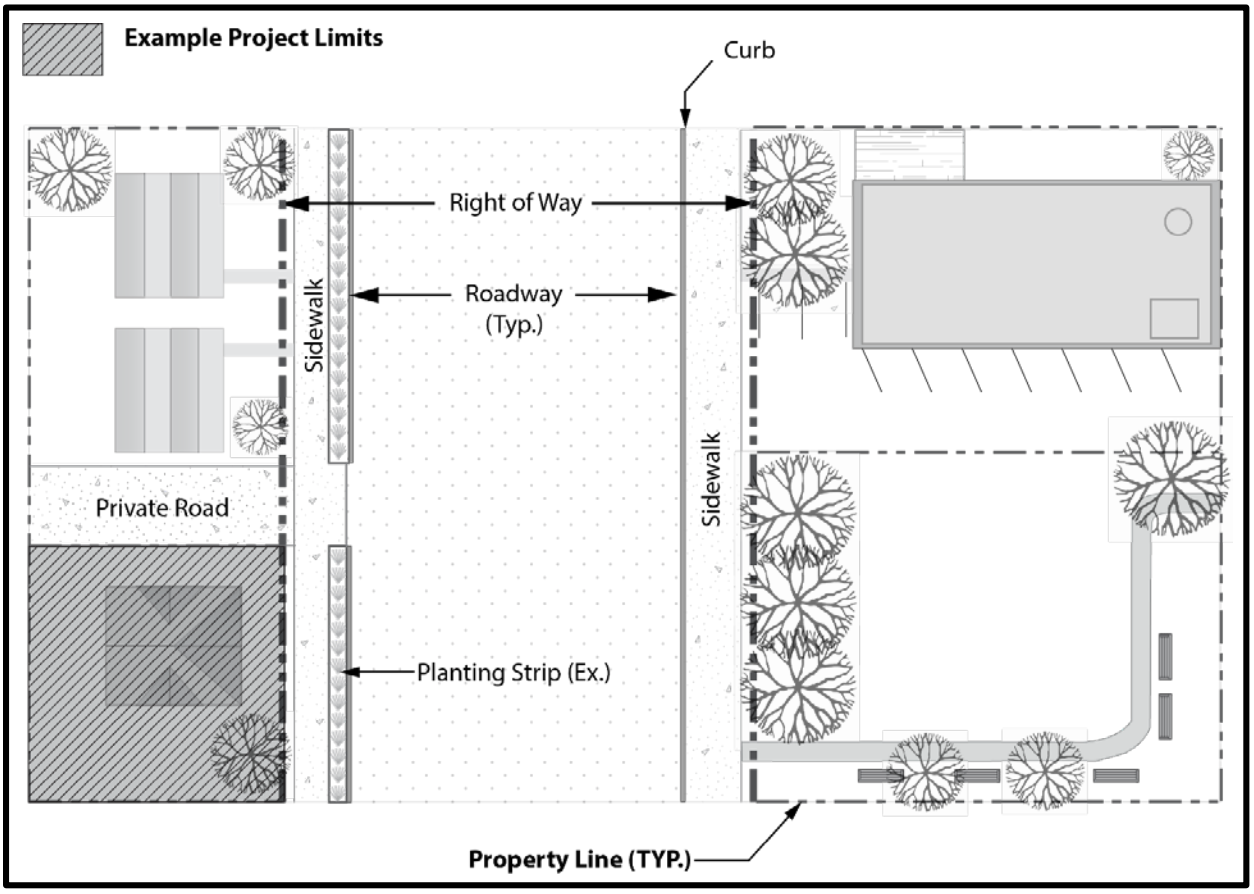


Figure 2.1. Single-family Residential Project Site Definition.

2. A **sidewalk project** (Figure 2.2) is defined as 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 (SMC, Section 22.801.200).

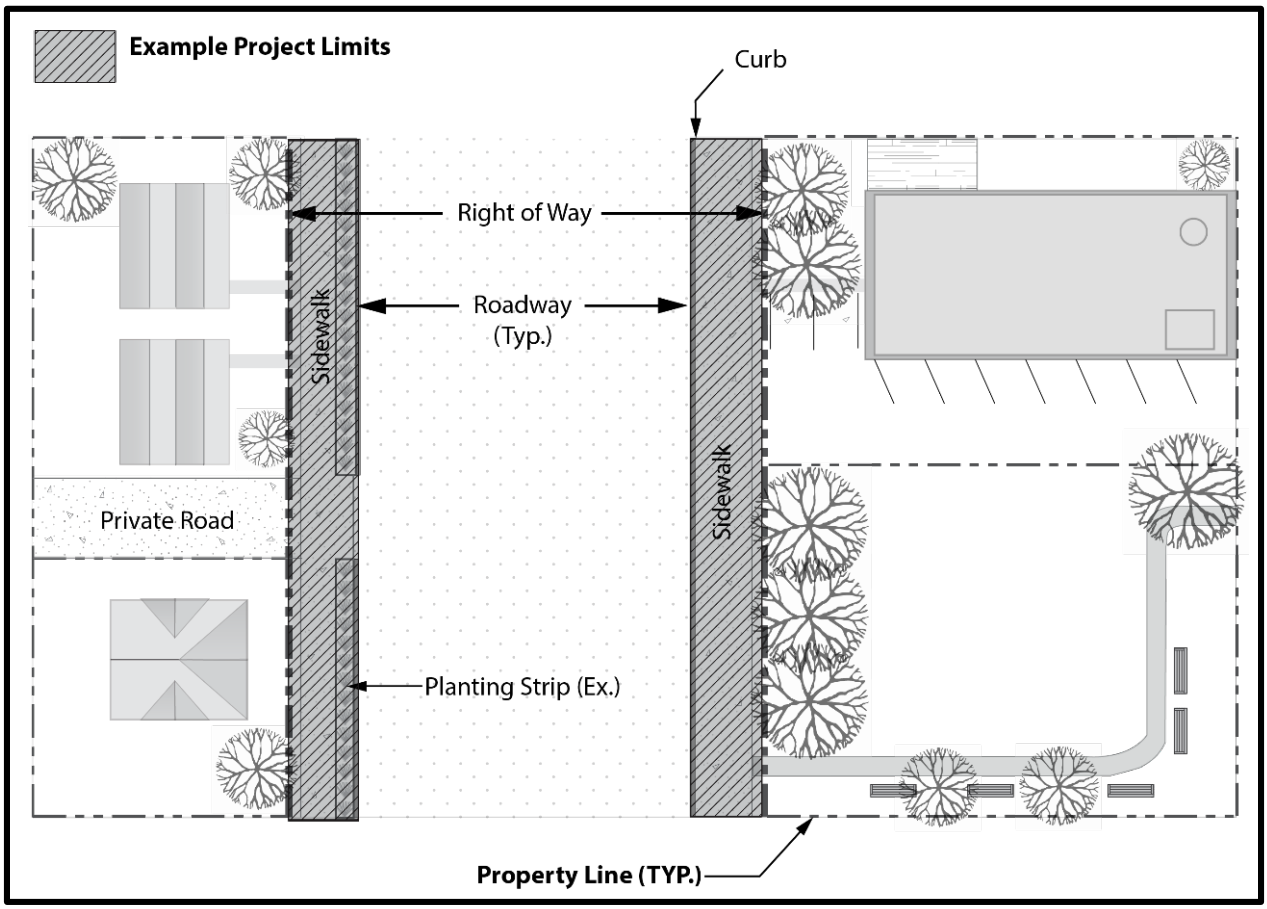


Figure 2.2. Sidewalk-only Project Site Definition.

3. A **trail project** (Figure 2.3) is defined as a project for the creation of a new trail or replacement of an existing trail, which does not contain PGHS (SMC, Section 22.801.210).

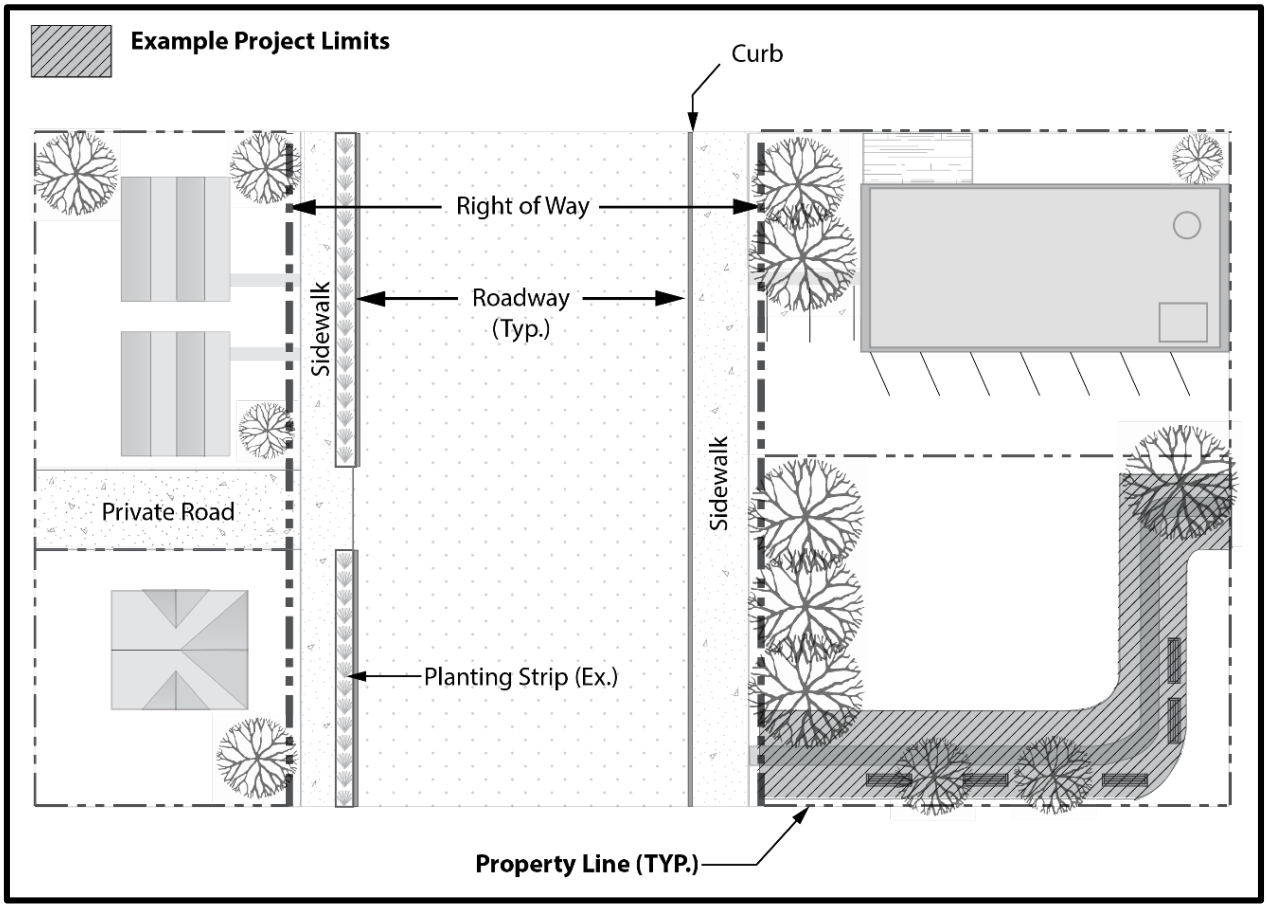


Figure 2.3. Trail Project Definition.

4. A **roadway project** (Figure 2.4) is defined as 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 (SMC, Section 22.801.190). A roadway project can also include other improvements located in the public right-of-way.

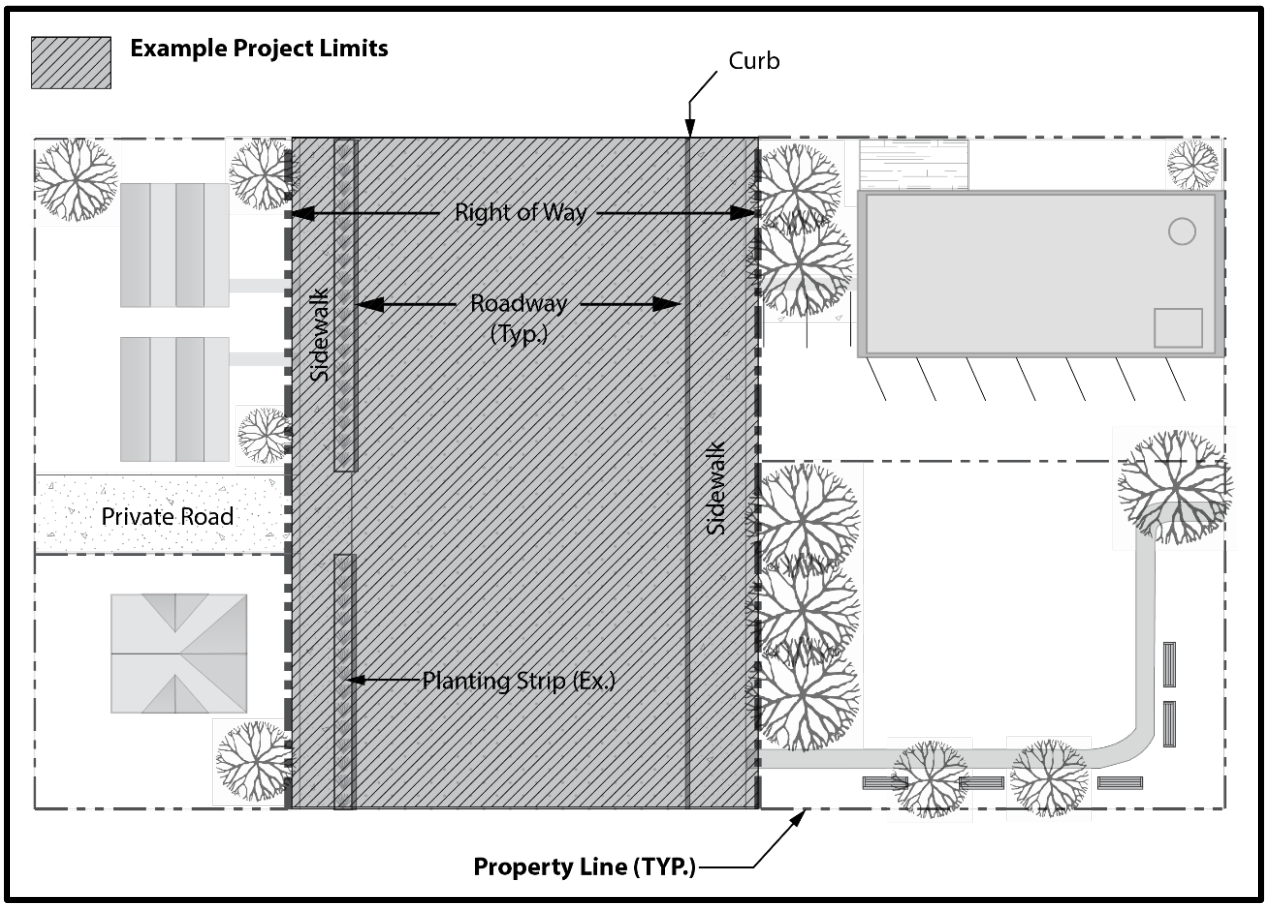


Figure 2.4. Roadway Project Site Definition.

5. A **parcel-based project** (Figure 2.5) means any project that is not a single-family residential project, 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 (SMC, Section 22.801.170). Examples include commercial developments and multi-family developments.

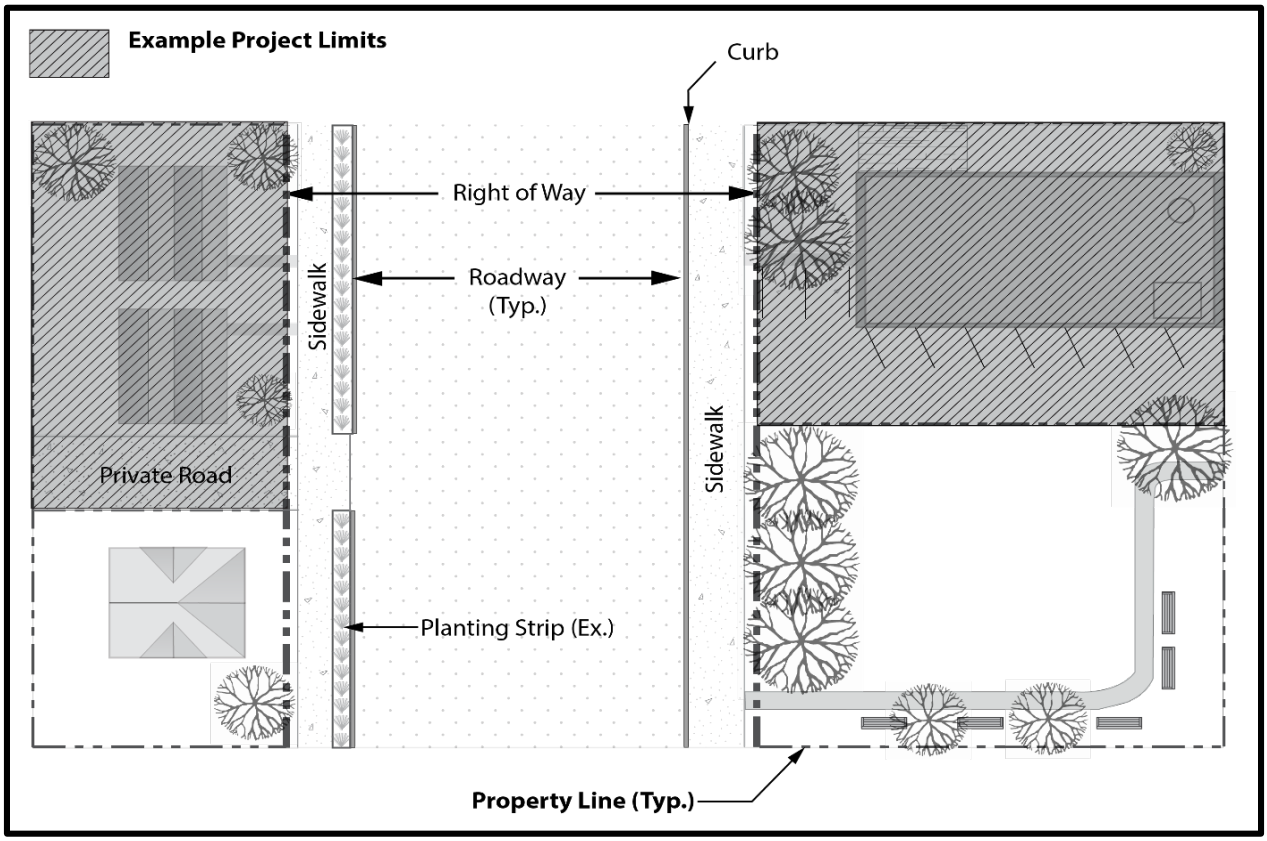


Figure 2.5. Parcel-based Project Site Definition.

6. For the purposes of this Manual, a **utility project** (land-disturbing activity not required to comply with requirements as stated in SMC, Section 22.800.040.A.2 unless otherwise noted below) includes maintenance, repair, or installation of underground or overhead utility facilities, such as, but not limited to, pipes, conduits, and vaults, and that includes replacing the ground surface with in-kind material or materials with similar runoff characteristics.

   Installation of a new or replacement of an existing public drainage system, public combined sewer, or public sanitary sewer in the public right-of-way shall comply with Section 22.805.060 (Minimum Requirements for Roadway Projects) when these activities are implemented as publicly bid capital improvement projects funded by Seattle Public Utilities,

7. For the purposes of this Manual, a **pavement maintenance project** (land-disturbing activity not required to comply with requirements as stated in SMC, Section 22.800.040.A.2) is limited to the following maintenance activities:

   - Pothole and square cut patching
   - Overlaying existing asphalt, concrete, or brick pavement with asphalt or concrete without expanding the area of coverage

- Shoulder grading
- Reshaping or regrading drainage ditches
- Crack sealing
- Vegetation maintenance

8. For the purposes of this Manual, a **Washington State Department of Transportation (WSDOT) project** (which shall manage stormwater as stated in SMC, Section 22.800.040.A.6) includes WSDOT roadway projects within state rights-of-way under WSDOT control within the jurisdiction of the City.
9. **Special circumstances projects** do not closely fit a defined project type and require a case-by-case review (refer to *Section 4.8*).

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 receiving water and system into which the project site discharges. The project proponent shall determine 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).

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. An overview of the types of receiving waters and systems in Seattle is provided below:

- **Wetlands**: designated under SMC, Section 25.09.020
- **Creek Basins**: include stream basins throughout Seattle (Figures 2.6 and 2.7), generally referred to as "creek basins." Discharges are to the creek or the associated drainage basin (example: SMC, Section 22.805.050.C.2).
- **Public Combined Sewer**: a publicly owned and maintained system that carries drainage water and wastewater to a publicly owned treatment works (SMC, Section 22.801.170) (Figure 2.8). Discharges are to the public combined sewer or its associated basin.
- **Small Lake Basins**: in Seattle these include Bitter Lake, Green Lake, and Haller Lake (Figures 2.6 and 2.7). Discharges are to the small lake or the associated drainage basin.
- **Designated Receiving Waters**: includes the Duwamish River, Puget Sound, Lake Washington, Lake Union, Elliott Bay, Portage Bay, Union Bay, the Lake Washington Ship Canal, and other receiving waters determined by the Director of Seattle Public Utilities (SPU) and approved by Ecology as having sufficient capacity to receive drainage discharges (Figures 2.9 and 2.10). Discharges are to the designated receiving water or its associated drainage basin.

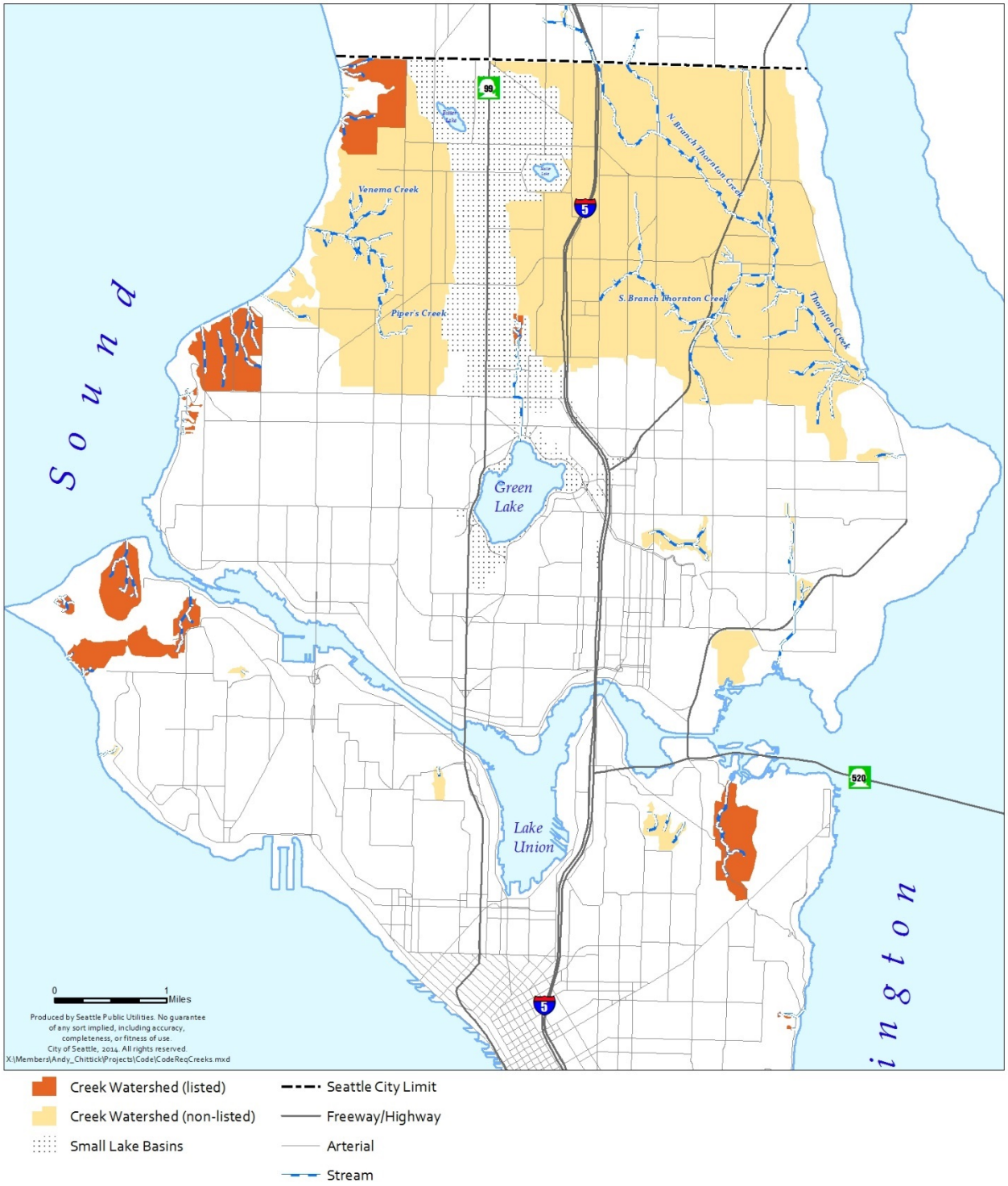


Figure 2.6. North End Creek and Small Lake Basins.

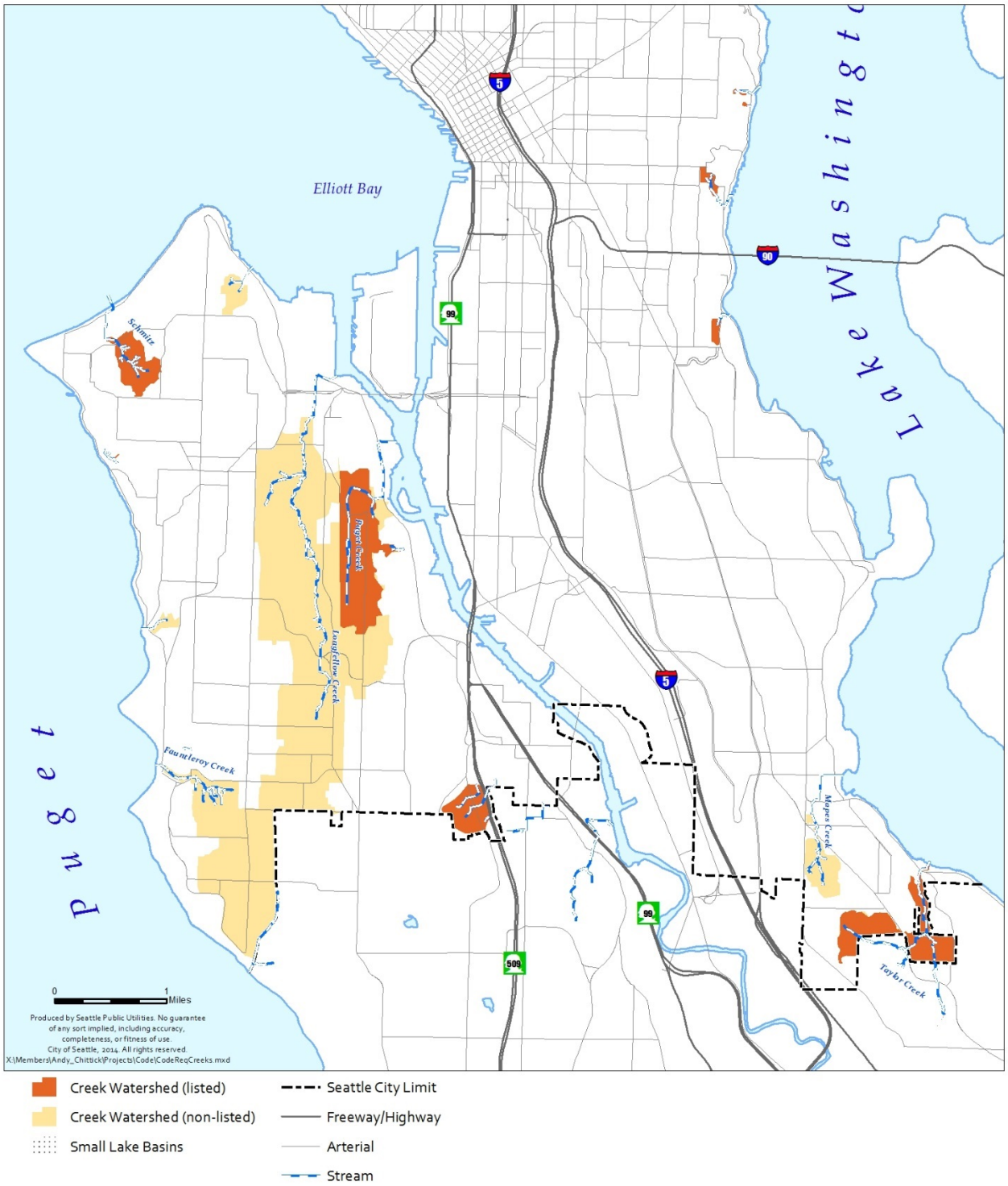


Figure 2.7. South End Creek and Small Lake Basins.

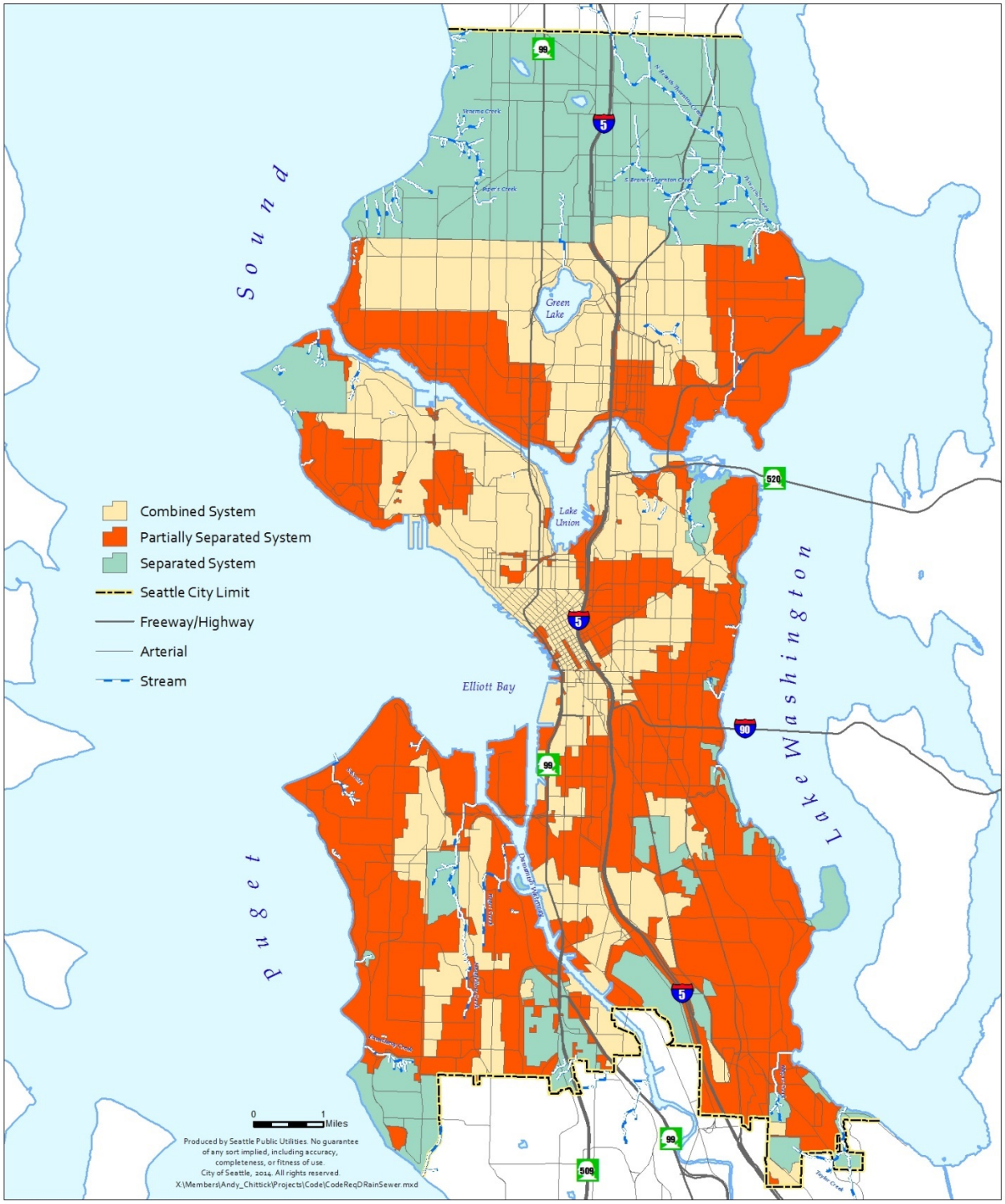


Figure 2.8. Public Combined Sewer Basins.

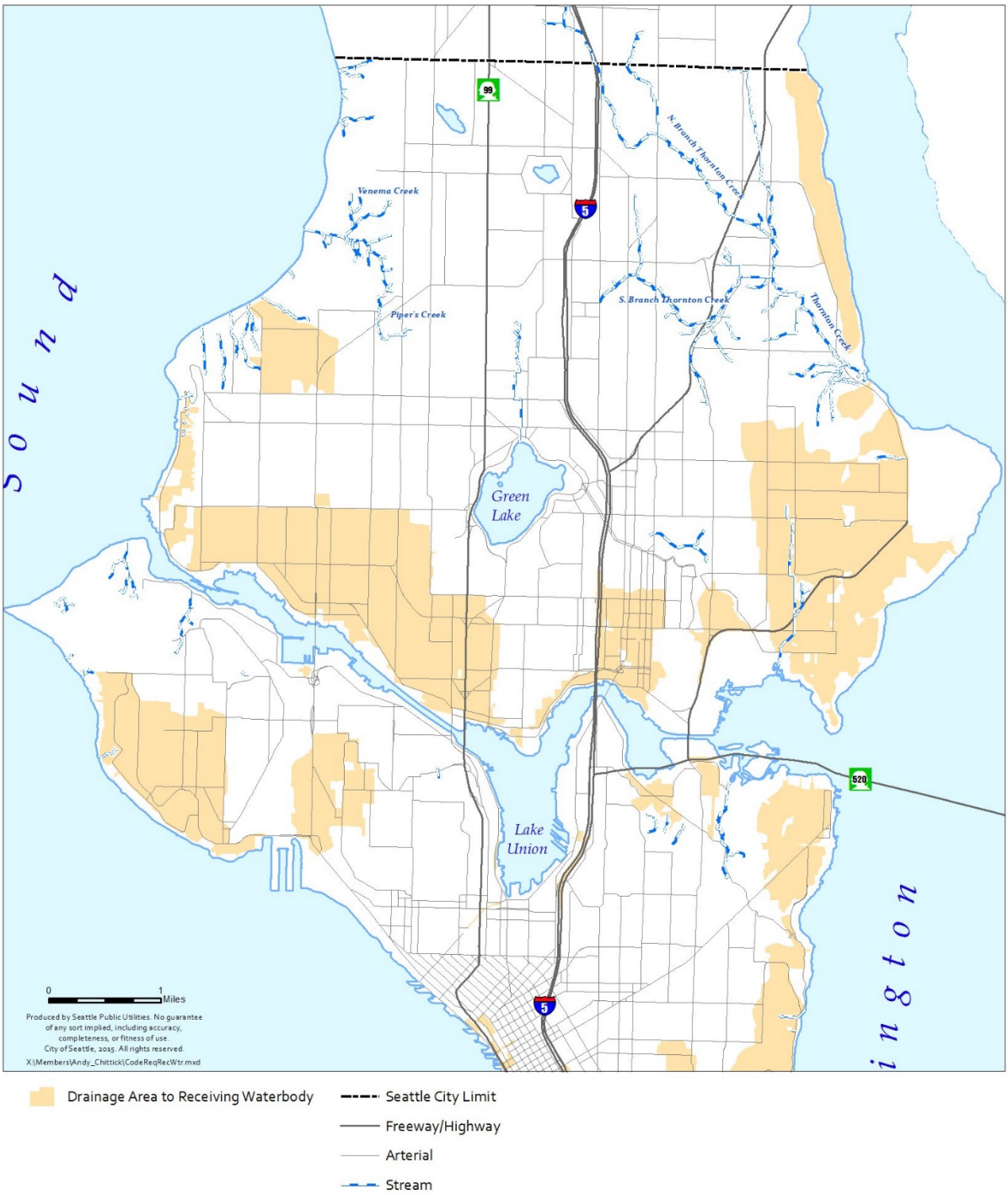


Figure 2.9. North End Designated Receiving Water Drainage Areas.

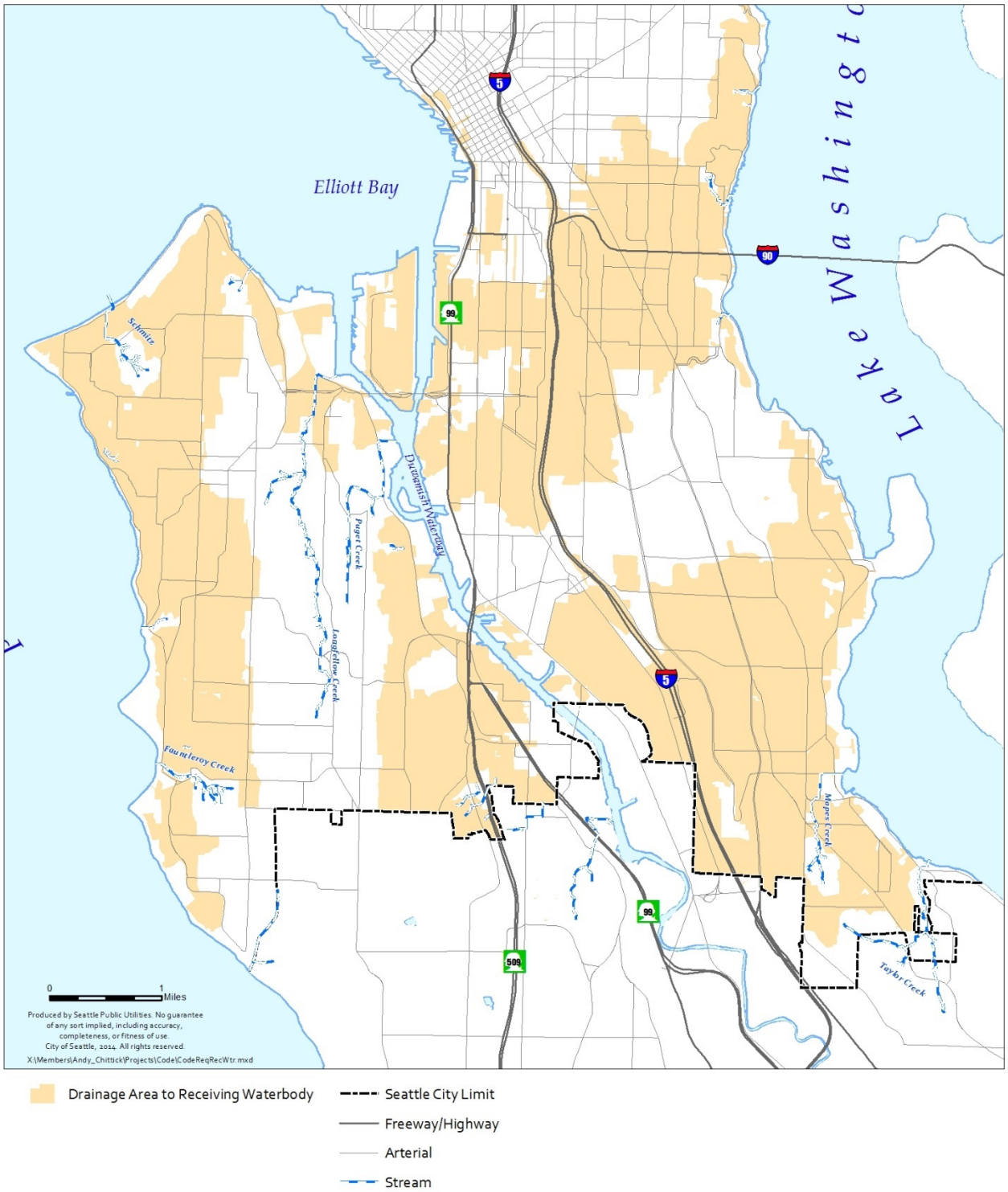


Figure 2.10. South End Designated Receiving Water Drainage Areas.

Capacity constraints in any downstream conveyance can modify the flow control requirements for discharges:

- A **Capacity-constrained System** is a drainage system or a 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 and culverts. Discharges are to the capacity-constrained system or its associated basin.

2.4. Step 4 – Perform Site Assessment and Planning

After the applicable minimum requirements have been identified, each project shall evaluate project design considerations and perform a site assessment as outlined in *Chapter 7*. The goal of the site assessment and planning step is to identify any additional issues that shall be addressed in association with stormwater management requirements. This step shall be completed before selecting on-site stormwater management, flow control, and/or treatment BMPs.

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

- Site boundaries and structures
- Soil conditions and infiltration capacity
- Critical area issues (e.g., flood plains, landslide prone areas, and site contamination)
- Groundwater elevations

Project proponents need to evaluate all the applicable code requirements and conduct a full site assessment to characterize site opportunities and constraints before choosing and designing stormwater strategies (refer to *Chapter 7*). Once the site conditions are known and the applicable minimum requirements have been identified, proceed to *Volume 3*, *Chapters 3*, *4*, and *5* to begin the BMP selection and design process.

2.5. Step 5– Calculate Land Disturbing Activity

The thresholds triggering specific Minimum Requirements for Flow Control are based on the amount of the project's new plus 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.

Note that open, uncovered retention or detention facilities shall not be considered as impervious surfaces for the purposes 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, athletic fields, rail yards) shall be considered as impervious surfaces for the purposes of determining whether the minimum requirement thresholds are exceeded. Refer to SMC, Section 22.801 and *Appendix A* for detailed definitions of these key terms.

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

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

2.6. Step 6 – Calculate New Plus Replaced Pollution Generating Surface

The thresholds triggering specific Minimum Requirements for 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 to be a significant source of pollutants in stormwater runoff. Examples of PGHS include areas subject to vehicular use (including permeable pavement); certain industrial activities; outdoor storage of erodible or leachable materials, wastes, or chemicals. Examples of PGPS include lawns, landscaping areas, golf courses, parks, cemeteries, and sports fields (natural and artificial turf). Metal roofs are considered a PGHS unless coated with an inert, non-leachable material (e.g., baked-on enamel coating). Refer to SMC, Section 22.801 and *Appendix A* for detailed definitions of these key terms.

New plus replaced PGHS and PGPS shall 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*)

CHAPTER 3 – MINIMUM REQUIREMENTS FOR ALL PROJECTS

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

Excerpts from the Stormwater Code (in *italics*) are presented below in the first column in each section. The second column in each section provides applicable references for further information on how to meet the requirement. Note that this section summarizes but does not replace or alter Stormwater Code requirements.

3.1. Maintaining Natural Drainage Patterns

Stormwater Code Language	References
SMC 22.805.020.A – 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.	• *Volume 1, Section 3.2* (SMC, Section 22.805.020.B) – Minimum Requirements for Discharge Point • *Volume 3, Section 3.3* – BMP Selection for On-site Stormwater Management • *Volume 3, Section 3.4* – BMP Selection for Flow Control

3.2. Discharge Point

Stormwater Code Language	References
SMC 22.805.020. B – 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.	• *Volume 3, Section 4.3.2* – Approved Point of Discharge

3.3. Flood-prone Areas

Stormwater Code Language	References
SMC 22.805.020.C – 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 23.60 (Shoreline District), Chapter 25.06 (Floodplain Development), and Chapter 25.09 (Environmentally Critical Areas) of the Seattle Municipal Code.	• SMC, Chapter 23.60 – Shoreline Master Program • SMC, Chapter 25.06 – Floodplain Development • SMC, Chapter 25.09 – Environmentally Critical Areas

3.4. Construction Site Stormwater Pollution Prevention Control

There are 19 elements required for construction site stormwater pollution prevention control (SMC, Section 22.805.020.D). These 19 elements include:

1. Mark Clearing Limits and Environmentally Critical Areas
2. Retain Top Layer
3. Establish Construction Access
4. Protect Downstream Properties and Receiving Waters
5. Prevent Erosion and Sediment Transport from the Site
6. Prevent Erosion and Sediment Transport from the Site by Vehicles
7. Stabilize Soils
8. Protect Slopes
9. Protect Storm Drains
10. Stabilize Channels and Outlets
11. Control Pollutants
12. Control Dewatering
13. Maintain BMPs
14. Inspect BMPs
15. Execute Construction Stormwater and Erosion Control Plan
16. Minimize Open Trenches
17. Phase the Project
18. Install Flow Control and Water Quality Facilities
19. Protect Stormwater BMPs

Stormwater Code Language	References
SMC 22.805.020.D – 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.	• *Volume 2, Chapter 3* – Selecting Construction Stormwater Controls • SMC, Section 22.805.020.D – Minimum Requirements for Construction Site Stormwater Pollution Prevention Control

3.5. Protect Wetlands

Stormwater Code Language	References
SMC 22.805.020.E – 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.	• SMC, Chapter 25.09 – Environmentally Critical Areas • Guide sheets 1 through 3 in the SWMMWW Volume I, Appendix I-D (Ecology 2014)

3.6. Protect Streams and Creeks

Stormwater Code Language	References
SMC 22.805.020.F – 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.	• None provided

3.7. Protect Shorelines

Stormwater Code Language	References
SMC 22.805.020.G – All projects discharging directly or indirectly through a drainage system into the shoreline district as defined in Chapter 23.60 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).	• SMC, Chapter 23.60 – Shoreline Master Program • WAC, Section 173-26-020(11) – Definitions – "Document of Record"

3.8. Ensure Sufficient Capacity

Stormwater Code Language	References
SMC 22.805.020.H – All large projects, all projects with an excavation depth of 12 feet or more below the existing grade, and all projects with an excavation depth of less than 12 feet located in an area expected to have shallow groundwater depths, shall ensure that sufficient capacity exists in the public 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 public 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).*	• *Volume 3, Section 4.3* – Conveyance General Design Requirements • *Appendix F* – Hydrologic Analysis and Design • CAM 1180 – Design Guidelines for Public Storm Drain Facilities

3.9. Install Source Control BMPs

Stormwater Code Language	References
SMC 22.805.020.I – Source control BMPs shall be installed for specific pollution-generating activities as specified in the joint SPU/SDCI Directors' Rule, "Seattle Stormwater Manual" at "Volume 4 – Source Control," to the extent necessary to prevent prohibited discharges as described in Section 22.802.020, 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: 1. *A roof, awning, or cover erected over the pollution-generating activity area;* 2. *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;* 3. *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.* 4. *Construct a berm or dike to enclose or contain the pollution-generating activities;* 5. *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;* 6. *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* 7. *Prevent precipitation from flowing or being blown onto containment areas of pollution- generating activities.*	• *Volume 4* – Source Control

3.10. Do Not Obstruct Watercourses

Stormwater Code Language	References
SMC 22.805.020.J – Watercourses shall not be obstructed.	• SMC, Chapter 22.808 – Stormwater Code Enforcement

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 Seattle Department of Construction and Inspection (SDCI) Drainage and Sewer Review Desk, 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	References
SMC 22.805.020.K – *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 and SDCI 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. the work is not constructed according to the plans approved under this subtitle, Chapter 21.16, the SPU Director's Rules promulgated under Title 21, and SPU and SDCI design and installation specifications, then the Director may issue a stop work order under Chapter 22.808 and require modifications as provided for in this subtitle and Chapter 21.16.*	• SMC, Chapter 21.16 – Side Sewer Code • SMC, Chapter 22.808 – Stormwater Code Enforcement • *Volume 5* – Enforcement

3.12. Maintenance and Inspection

Projects that construct on-site stormwater management, flow control, and water quality treatment BMPs shall comply with the maintenance and inspection requirements specified in SMC, Section 22.807.090.

Stormwater Code Language	References
SMC 22.807.090 – *A. Responsibility for Maintenance and Inspection. The owner and other responsible parties shall maintain drainage control facilities, source controls, and other facilities 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.* *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.*	• *Appendix G* – Stormwater Control Operations and Maintenance Requirements

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 upon project type and are summarized in this chapter. Project types are defined in *Chapter 2*, *Step 2*. Excerpts from the Stormwater Code (in italics) are presented in the first column in each section. The second column in each section provides applicable references. Flow charts are included in the roadway and parcel-based project sections (*Sections 4.3* and *4.4*) to summarize the key minimum requirements. Utility and pavement maintenance project types are exempt from certain minimum requirements (refer to *Sections 4.5* and *4.6* for additional information). This chapter also includes a short section on WSDOT projects (*Sections 4.7*) and special circumstances (*Sections 4.8*), applicable when a project does not fit into the other project type categories.

The key minimum requirements include the following:

- Soil Amendment
- On-site Stormwater Management
- Wetland Protection Standard
- Pre-developed Forested Standard
- Pre-developed Pasture Standard
- Peak Control Standard
- Basic Treatment
- Oil Treatment
- Phosphorus Treatment
- 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 and/or type of downstream conveyance
- 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)

4.1. Single-family Residential Projects

The applicable code language and references for single-family residential projects are summarized below. Note that single-family residential projects are not required to install flow control or water quality treatment BMPs since the project type, by definition, does not trigger the minimum requirements for flow control or water quality treatment.

Stormwater Code Language	References
SMC 22.805.030 – *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.* *B. On-site Stormwater Management. Single-family residential projects shall meet the Minimum Requirements for On-site Stormwater Management contained in Section 22.805.070, to the extent allowed by law, if:* *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 reduced 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* *2. For any other project, either the total new plus replaced hard surface is 1,500 square feet or the land disturbing activity is 7,000 square feet or more.*	• *Volume 1, Section 5.1* (SMC, Section 22.805.030) – Soil Amendment • *Volume 1, Section 5.2* (SMC, Section 22.805.070) – On-site Stormwater Management • *Volume 3, Section 3.3* – BMP Selection for On-Site Stormwater Management

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.

Stormwater Code Language	References
SMC 22.805.040 – *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.* *B. 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 Minimum Requirements for On-site Stormwater Management contained in Section 22.805.070, to the extent allowed by law.*	• *Volume 1, Section 5.1* (SMC, Section 22.805.040)– Soil Amendment • *Volume 1, Section 5.2* (SMC, Section 22.805.070)– On-site Stormwater Management • *Volume 3, Section 3.3* – BMP Selection for On-Site Stormwater Management

4.3. Roadway Projects

Roadway projects shall meet the minimum requirements for soil amendment (SMC, Section 22.805.060.A), on-site stormwater management (SMC, Section 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 4.1a through 4.1c. In addition to meeting a forested, pasture, or wetland protection standard, projects discharging to a capacity-constrained system will also be required to meet the peak control standard.

4.3.1. Soil Amendment

Stormwater Code Language	References
SMC 22.805.060.A – 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.	• *Volume 1, Section 5.1* (SMC, Section 22.805.060.A) – Soil Amendment

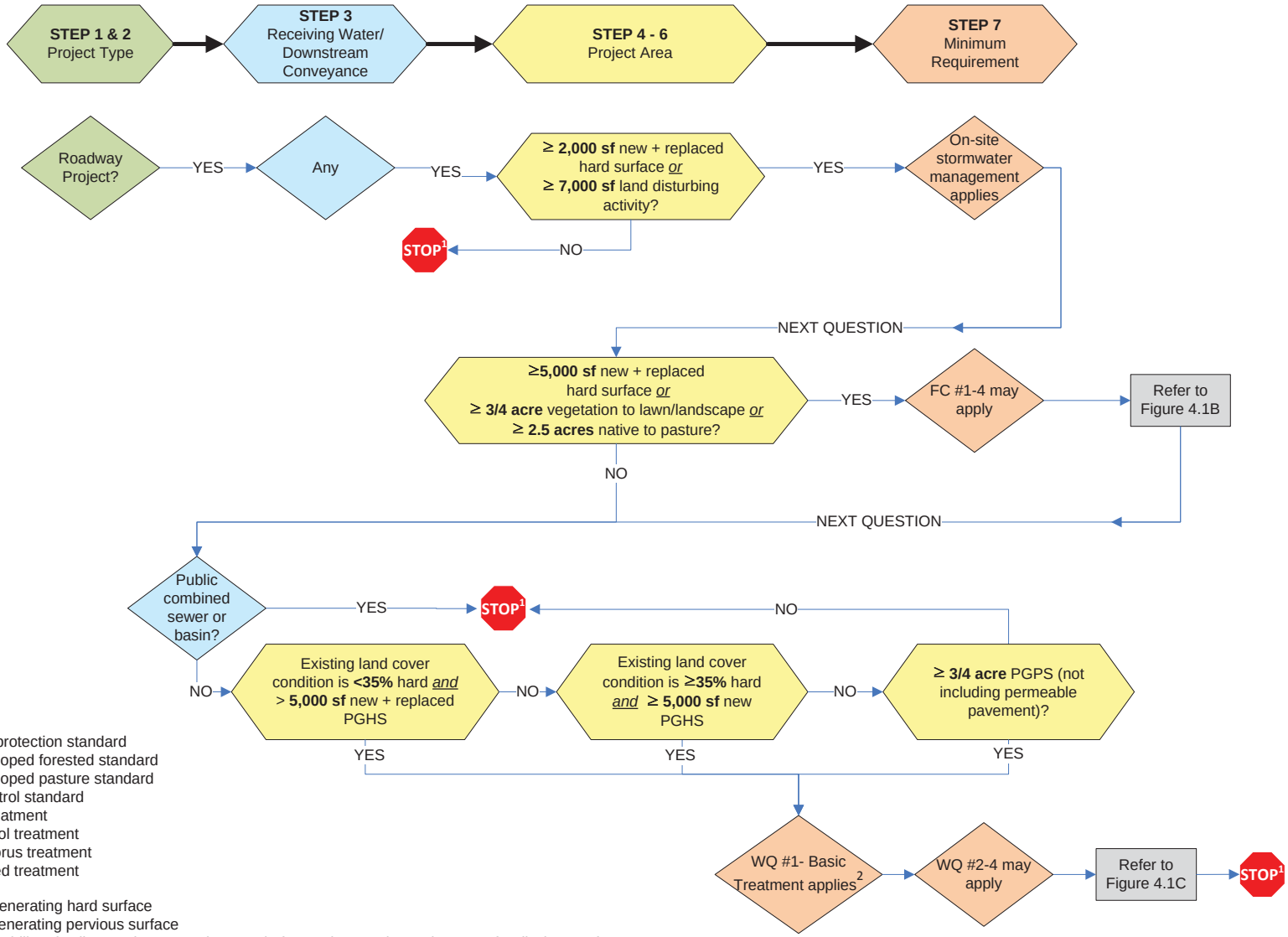
4.3.2. On-site Stormwater Management

Stormwater Code Language	References
SMC 22.805.060.B – 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 Minimum 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.	• *Volume 1, Section 5.2* (SMC, Section 22.805.070) – On-site Stormwater Management • *Volume 3, Section 3.3* – BMP Selection for On-site Stormwater Management

4.3.3. Flow Control

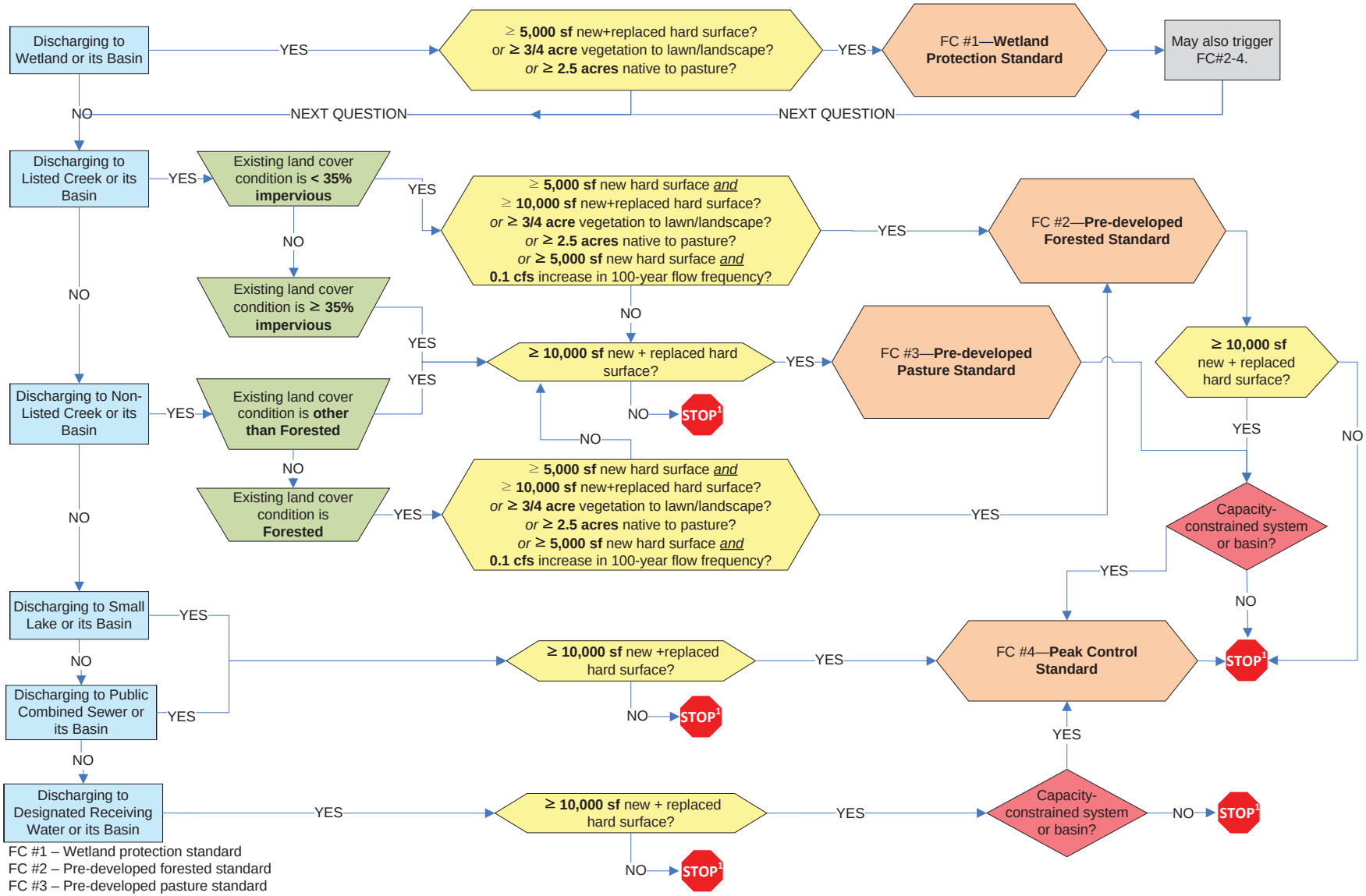
4.3.3.1. Roadway Projects Discharging to Wetlands – Flow Control

Stormwater Code Language	References
SMC 22.805.060.C.1 – Discharges to Wetlands. Roadway projects discharging into a wetland or to the drainage basin of a wetland shall comply with subsection 22.805.080.B.1 (Wetland Protection Standard) if: *a. The total new plus replaced hard surface is 5,000 square feet or more; or* *b. 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 man-made conveyance system from the site; or* *c. 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 man-made conveyance system from the site.*	• SMC, Section 22.805.080.B.1 – Wetland Protection Standard • *Volume 1, Section 3.5* (SMC, Section 22.805.020.E) – Protect Wetlands • Guide sheets 1 through 3 in the SWMMWW Volume I, Appendix I-D (Ecology 2014)



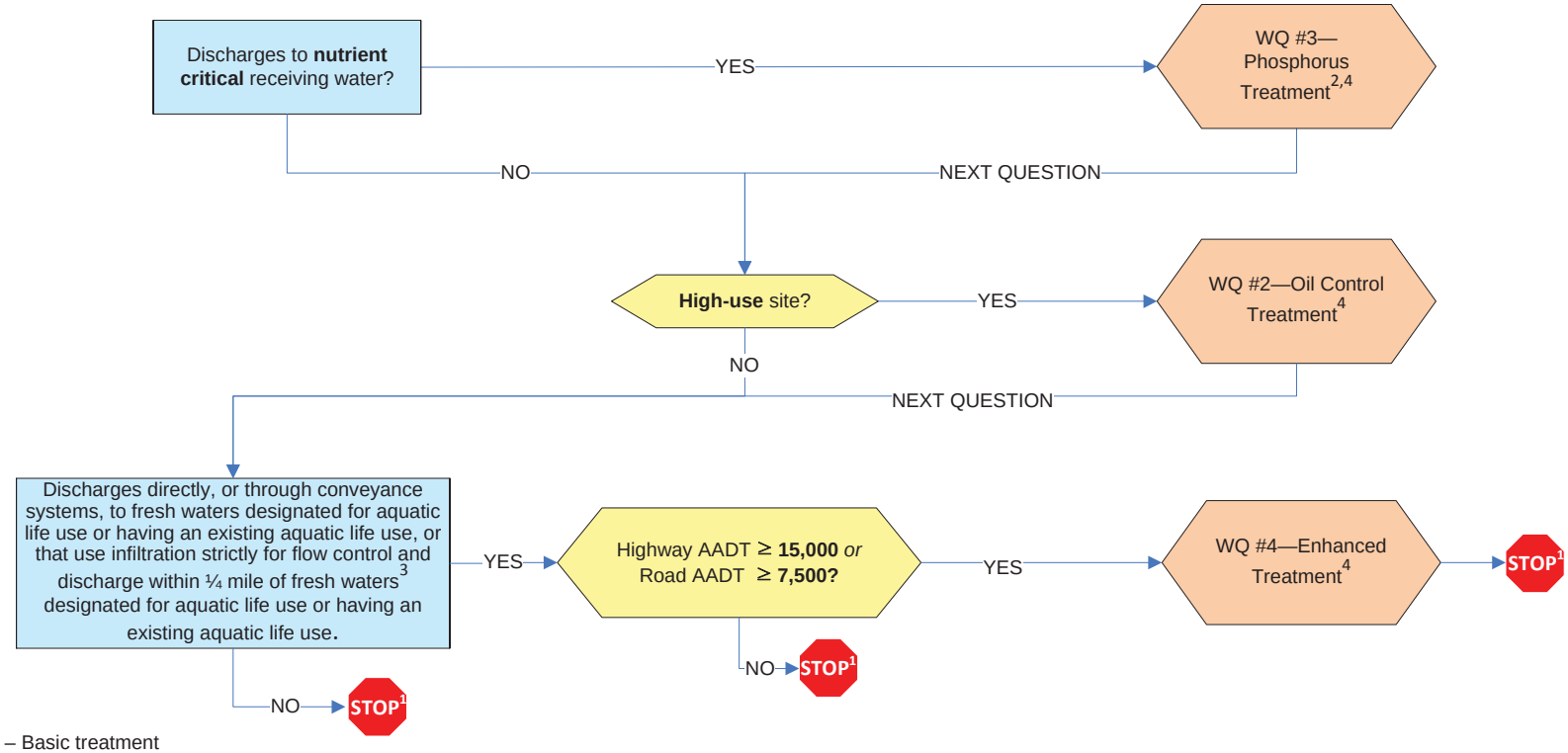
FC #1 – Wetland protection standard
FC #2 – Pre-developed forested standard
FC #3 – Pre-developed pasture standard
FC #4 – Peak control standard
WQ #1 – Basic treatment
WQ #2 – Oil control treatment
WQ #3 – Phosphorus treatment
WQ #4 – Enhanced treatment
sf- square feet
PGHS- pollution generating hard surface
PGPS- pollution generating pervious surface
1- Evaluate applicability of soil amendment requirement (refer to Chapter 5), requirements for discharges from groundwater (refer to Chapter 4), and minimum requirements for all projects (refer to Chapter 3).
2- Evaluate if water quality treatment requirements apply to all PGHS or only to new PGHS (refer to SMC 22.805.060.D2.)

Figure 4.1A. Project Minimum Requirement Overview Flow Chart for Roadway Projects.



FC #1 – Wetland protection standard
FC #2 – Pre-developed forested standard
FC #3 – Pre-developed pasture standard
FC #4 – Peak control standard
sf- square feet
PGHS- pollution generating hard surface
PGPS- pollution generating pervious surface
1- Evaluate applicability of soil amendment requirement (refer to Chapter 5), requirements for discharges from groundwater (refer to Chapter 4), and minimum requirements for all projects (refer to Chapter 3).

Figure 4.1B. Flow Control Minimum Requirements for Roadway Projects.



WQ #1 – Basic treatment
WQ #2 – Oil control treatment
WQ #3 – Phosphorus treatment
WQ #4 – Enhanced treatment
PGHS- pollution generating hard surface
PGPS- pollution generating pervious surface
AADT- Annual Average Daily Traffic

1- Evaluate applicability of soil amendment requirement (refer to Chapter 5), requirements for discharges from groundwater (refer to Chapter 4), and minimum requirements for all projects (refer to Chapter 3).
2- At the time this Stormwater Manual was developed, there were no established phosphorus-specific treatment requirements for project-scale treatment BMPs in Seattle. Refer to the SDCI website to determine if any nutrient-critical treatment criteria apply (www.seattle.gov/dpd/codesrules/codes/stormwater/default.htm)
3- 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, at minimum, the following water bodies are designated for aquatic life use: small lakes, creeks, and freshwater designated receiving waters.
4- Evaluate if water quality treatment requirements apply to all PGHS or only to new PGHS (refer to SMC 22.805.060.D2.)

Figure 4.1C. Water Quality Treatment Minimum Requirements for Roadway Projects.

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

Stormwater Code Language	References
SMC 22.805.060.C.2 – 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: *a. Comply with subsection 22.805.080.B.2 (Pre-developed Forested Standard) if the existing hard surface coverage is less than 35 percent and one or more of the following apply:* *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* *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 man-made conveyance system from the site; or* *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 man-made conveyance system from the site; or* *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 0.1 cubic feet per second increase in the 100-year recurrence interval flow frequency as estimated using a continuous model approved by the Director. [*For projects that trigger 22.805.060.C.2.a.4, the 0.1 cfs threshold applies when modeling is conducted using a one-hour time step. When modeling is conducted using a 15-minute time step, a 0.15 cfs threshold applies.] *b. Comply with subsection 22.805.080.B.3 (Pre-developed Pasture 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.*	• SMC, Section 22.805.080.B.2 – Pre-developed Forested Standard • SMC, Section 22.805.080.B.3 – Pre-developed Pasture Standard • Figure 2.6 – North End Creek and Small Lake Basins • Figure 2.7 – South End Creek and Small Lake Basins • *Volume 3, Section 3.4* – BMP Selection for Flow Control • *Volume 3, Section 4.1* – Sizing Approach

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

Stormwater Code Language	References
SMC 22.805.060.C.3 – Roadway projects discharging into a creek not listed in subsection 22.805.060.C.2, or to the drainage basin of such creek, shall: *a. Comply with subsection 22.805.080.B.2 (Pre-developed Forested Standard) if the existing land cover is forested and one or more of the following apply:* *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* *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 man-made conveyance system from the site; or* *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 man-made conveyance system from the site; or* *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 0.1 cubic feet per second increase in the 100-year recurrence interval flow frequency as estimated using a continuous model approved by the Director.* [For projects that trigger 22.805.060.C.3.a.4, the 0.1 cfs threshold applies when modeling is conducted using a one-hour time step. When modeling is conducted using a 15-minute time step, a 0.15 cfs threshold applies.] *b. Comply with subsection 22.805.080.B.3 (Pre-developed Pasture 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.*	• SMC, Section 22.805.080.B.2 – Pre-developed Forested Standard • SMC, Section 22.805.080.B.3 – Pre-developed Pasture Standard • Figure 2.6 – North End Creek and Small Lake Basins • Figure 2.7 – South End Creek and Small Lake Basins • *Volume 3, Section 3.4* – BMP Selection for Flow Control • *Volume 3, Section 4.1* – Sizing Approach

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

Stormwater Code Language	References
SMC 22.805.060.C.4 – 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.B.4 (Peak Control Standard) if the total new plus replaced hard surface is 10,000 square feet or more.	• SMC, Section 22.805.080.B.4 – Peak Control Standard • Figure 2.6 – North End Creek and Small Lake Basins • Figure 2.7 – South End Creek and Small Lake Basins • *Volume 3, Section 3.4* – BMP Selection for Flow Control • *Volume 3, Section 4.1* – Sizing Approach

4.3.3.5. Roadway Projects Discharging to Public Combined Sewer – Flow Control

At the time this Manual was developed, there was one public combined sewer basin that was determined to have sufficient capacity to carry existing and anticipated loads. Roadway 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 (http://www.seattle.gov/dpd/codesrules/codes/stormwater/).

Stormwater Code Language	References
SMC 22.805.060.C.5 – Unless the Director of SPU has determined that the public combined sewer has sufficient capacity to carry existing and anticipated loads, roadway projects discharging into the public combined sewer or its basin shall comply with subsection 22.805.080.B.4 (Peak Control Standard) if the total new plus replaced hard surface is 10,000 square feet or more.	• SMC, Section 22.805.080.B.4 – Peak Control Standard • Figure 2.8 – Public Combined Sewer Basins • *Volume 3, Section 3.4* – BMP Selection for Flow Control • *Volume 3, Section 4.1* – Sizing Approach

4.3.3.6. Roadway Projects Discharging to a Capacity-constrained System – Flow Control

Stormwater Code Language	References
SMC 22.805.060.C.6 – In addition to applicable minimum requirements for flow control in subsection 22.805.00.C.1 through subsection 22.805.060.C.5, roadway projects discharging into a capacity-constrained system or its basin shall also comply with subsection 22.805.080.B.4 (Peak Control Standard) if the total new plus replaced hard surface is 10,000 square feet or more. *SMC 22.801.040 – "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.*	• SMC, Section 22.805.060.C.1 – Discharges to Wetlands • SMC, Section 22.805.060.C.2 – Discharges to Listed Creek Basins • SMC, Section 22.805.060.C.3 – Discharges to Non-listed Creek Basins • SMC, Section 22.805.060.C.4 – Discharges to Small Lake Basins • SMC, Section 22.805.060.C.5 – Discharges to Public Combined Sewer • SMC, Section 22.805.080.B.4 – Peak Control Standard • *Volume 3, Section 3.4* – BMP Selection for Flow Control • *Volume 3, Section 4.1* – Sizing Approach

4.3.3.7. Roadway Projects Discharging Groundwater – Flow Control

Stormwater Code Language	References
SMC 22.805.060.C.7 – In addition to applicable minimum requirements for flow control in subsection 22.805.060.C.1 through subsection 22.805.060.C.6, roadway 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.B.4 (Peak Control Standard) if the total new plus replaced hard surface is 10,000 square feet or more.	• SMC, Section 22.805.060.C.7– Discharges from Groundwater

4.3.4. Water Quality Treatment

Stormwater Code Language	References
SMC 22.805.060.D – 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: *1. 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* *2. If the site has greater than or equal to 35 percent existing impervious surface coverage and the project's total new pollution-generating hard surface is 5,000 square feet or more, and* *a. If the new pollution-generating hard surface adds 50 percent or more to 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* *b. If the new pollution-generating hard surface adds less than 50 percent to 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* *3. If the total new plus replaced pollution-generating pervious surfaces is 3/4 acres or more, and from the project there is a surface discharge in a natural or man-made 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.*	• SMC, Section 22.805.090 – Minimum Requirements for Treatment • *Volume 1, Section 5.4* (SMC, Section 22.805.090) – Water Quality Treatment • *Volume 3, Section 3.5* – BMP Selection for Water Quality Treatment • *Volume 3, Section 4.1* – Sizing Approach

4.4. Parcel-based Projects

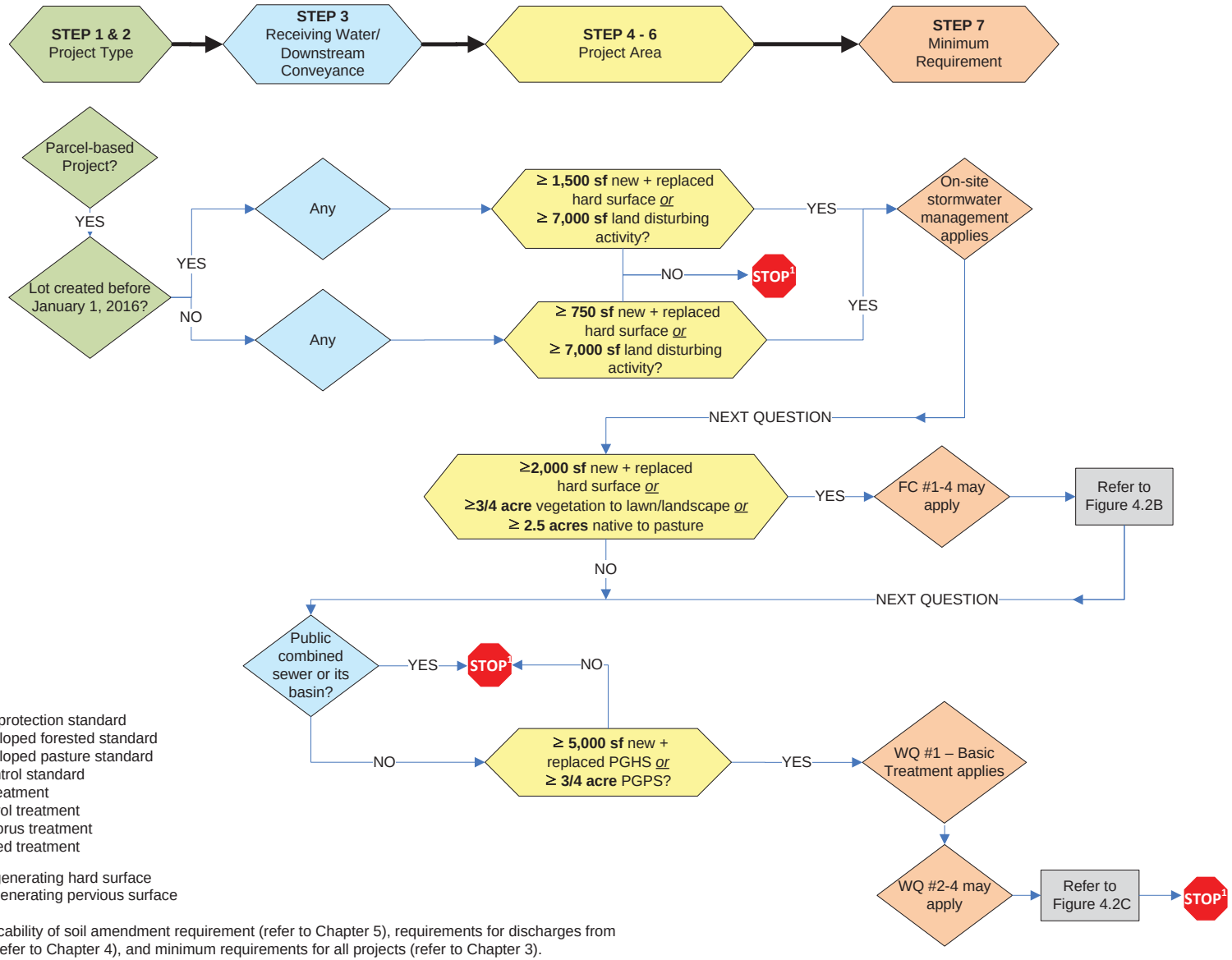
Parcel-based projects shall meet the minimum requirements for soil amendment (SMC, Section 22.805.050.A), on-site stormwater management (SMC, Section 22.805.070), flow control (SMC, Section 22.805.080) and water quality treatment (SMC, Section 22.805.090), when applicable. Key minimum requirements for parcel-based projects are summarized in Figures 4.2a through 4.2c. In addition to meeting a forested, pasture, or wetland protection standard, projects discharging to a capacity-constrained system will also be required to meet the peak control standard.

4.4.1. Soil Amendment

Stormwater Code Language	References
SMC 22.805.050.A – 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.	• *Volume 1, Section 5.1* (SMC, Section 22.805.050.A) – Soil Amendment

4.4.2. On-site Stormwater Management

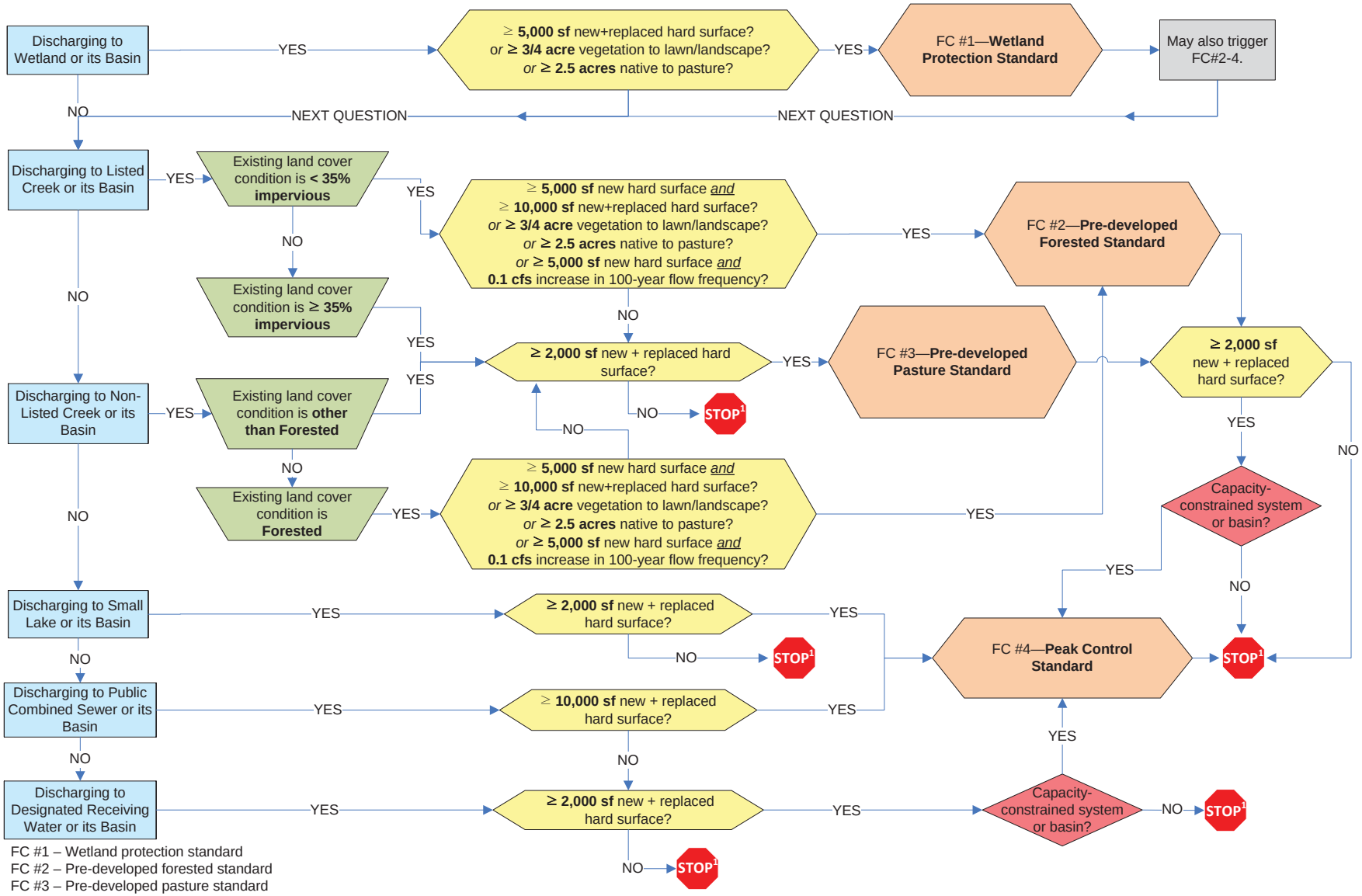
Stormwater Code Language	References
SMC 22.805.050 – *B. On-site Stormwater Management. Parcel-based projects shall meet the Minimum Requirements for On-site Stormwater Management contained in Section 22.805.070, to the extent allowed by law, if:* *1. For a project on a lot most recently created, adjusted, 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 reduced 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* *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.*	• *Volume 1, Section 5.2* (SMC, Section 22.805.070) – On-site Stormwater Management • *Volume 3, Section 3.3* – BMP Selection for On-site Stormwater Management



FC #1 – Wetland protection standard
FC #2 – Pre-developed forested standard
FC #3 – Pre-developed pasture standard
FC #4 – Peak control standard
WQ #1 – Basic treatment
WQ #2 – Oil control treatment
WQ #3 – Phosphorus treatment
WQ #4 – Enhanced treatment
sf- square feet
PGHS- pollution generating hard surface
PGPS- pollution generating pervious surface

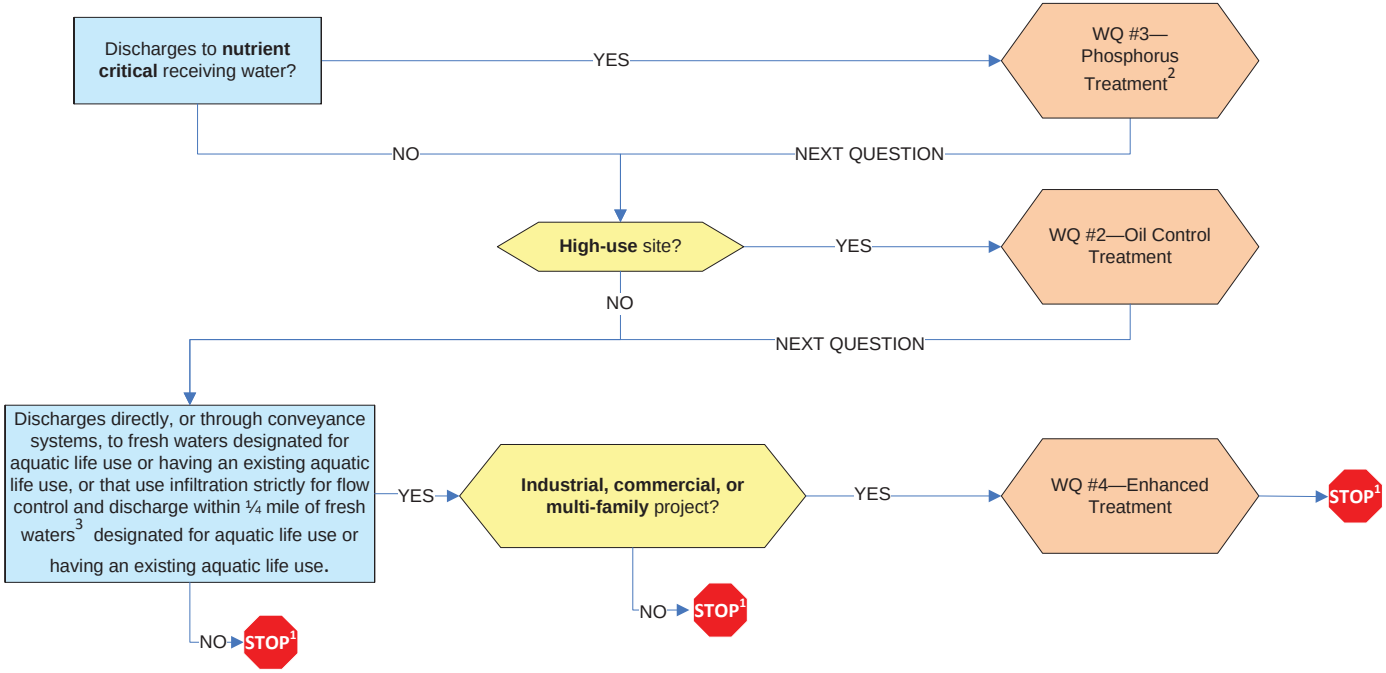
1- Evaluate applicability of soil amendment requirement (refer to Chapter 5), requirements for discharges from groundwater (refer to Chapter 4), and minimum requirements for all projects (refer to Chapter 3).

Figure 4.2A. Project Minimum Requirement Overview Flow Chart for Parcel-Based Projects.



FC #1 – Wetland protection standard
FC #2 – Pre-developed forested standard
FC #3 – Pre-developed pasture standard
FC #4 – Peak control standard
sf- square feet
PGHS- pollution generating hard surface
PGPS- pollution generating pervious surface
1- Evaluate applicability of soil amendment requirement (refer to Chapter 5), requirements for discharges from groundwater (refer to Chapter 4), and minimum requirements for all projects (refer to Chapter 3).

Figure 4.2B. Flow Control Minimum Requirements for Parcel-Based Projects.



WQ #1 – Basic treatment
WQ #2 – Oil control treatment
WQ #3 – Phosphorus treatment
WQ #4 – Enhanced treatment
sf- square feet
PGHS- pollution generating hard surface
PGPS- pollution generating pervious surface

1- Evaluate applicability of soil amendment requirement (refer to Chapter 5), requirements for discharges from groundwater (refer to Chapter 4), and minimum requirements for all projects (refer to Chapter 3).
2- At the time this Stormwater Manual was developed, there were no established phosphorus-specific treatment requirements for project-scale treatment BMPs in Seattle. Refer to the SDCI website to determine if any nutrient-critical treatment criteria apply (www.seattle.gov/dpd/codesrules/codes/stormwater/default.htm).
3- 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, at minimum, the following water bodies are designated for aquatic life use: small lakes, creeks, and freshwater designated receiving waters.

Figure 4.2C. Water Quality Treatment Minimum Requirements for Parcel-Based Projects.

4.4.3. Flow Control

4.4.3.1. Parcel-based Projects Discharging to Wetlands – Flow Control

Stormwater Code Language	References
SMC 22.805.050.C.1 – Parcel-based projects discharging into a wetland or to the drainage basin of a wetland shall comply with subsection 22.805.080.B.1 (Wetland Protection Standard) if: *a. The total new plus replaced hard surface is 5,000 square feet or more; or* *b. 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 man-made conveyance system from the site; or* *c. 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 man-made conveyance system from the site.*	• *Volume 1, Section 5.3.1* (SMC, Section 22.805.080.B.1) – Wetland Protection Standard • *Volume 1, Section 3.5* – Protect Wetlands • Guide sheets 1 through 3 in the SWMMWW Volume I, Appendix I-D (Ecology 2014)

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

Stormwater Code Language	References
SMC 22.805.050.C.2 – 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: *a. Comply with subsection 22.805.080.B.2 (Pre-developed Forested Standard) if the existing hard surface coverage is less than 35 percent and one or more of the following apply:* *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* *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 man-made conveyance system from the site; or* *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 man-made conveyance system from the site; or* *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 0.1 cubic feet per second increase in the 100-year recurrence interval flow frequency as estimated using a continuous model approved by the Director. [For projects that trigger 22.805.050.C.2.a.4, the 0.1 cfs threshold applies when modeling is conducted using a one-hour time step. When modeling is conducted using a 15-minute time step, a 0.15 cfs threshold applies.]* *b. Comply with subsection 22.805.080.B.3 (Pre-developed Pasture Standard) if the criteria in subsection 22.805.050.C.2.a do not apply and the total new plus replaced hard surface is 2,000 square feet or more.*	• *Volume 1, Section 5.3.2* (SMC, Section 22.805.080.B.2) – Pre-developed Forested Standard • *Volume 1, Section 5.3.3* (SMC, Section 22.805.080.B.3) – Pre-developed Pasture Standard • Figure 2.6 – North End Creek and Small Lake Basins • Figure 2.7 – South End Creek and Small Lake Basins • *Volume 3, Section 3.4* – BMP Selection for Flow Control • *Volume 3, Section 4.1* – Sizing Approach

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

Stormwater Code Language	References
SMC 22.805.050.C.3 – 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: *a. Comply with subsection 22.805.080.B.2 (Pre-developed Forested Standard) if the existing land cover is forested and one or more of the following apply:* *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* *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 man-made conveyance system from the site; or* *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 man-made conveyance system from the site; or* *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 0.1 cubic feet per second increase in the 100 year recurrence interval flow frequency as estimated using a continuous model approved by the Director.* [For projects that trigger 22.805.050.C.3.a.4, the 0.1 cfs threshold applies when modeling is conducted using a one-hour time step. When modeling is conducted using a 15-minute time step, a 0.15 cfs threshold applies.] *b. Comply with subsection 22.805.080.B.3 (Pre-developed Pasture Standard) if the criteria in subsection 22.805.050.C.3.a do not apply and the total new plus replaced hard surface is 2,000 square feet or more.*	• *Volume 1, Section 5.3.2* (SMC, Section 22.805.080.B.2) – Pre-developed Forested Standard • *Volume 1, Section 5.3.3* (SMC, Section 22.805.080.B.3) – Pre-developed Pasture Standard • Figure 2.6 – North End Creek and Small Lake Basins • Figure 2.7 – South End Creek and Small Lake Basins • *Volume 3, Section 3.4* – BMP Selection for Flow Control • *Volume 3, Section 4.1* – Sizing Approach

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

Stormwater Code Language	References
SMC 22.805.050.C.4 – 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.B.4 (Peak Control Standard) if the total new plus replaced hard surface is 2,000 square feet or more.	• *Volume 1, Section 5.3.4* (SMC, Section 22.805.080.B.4) – Peak Control Standard • Figure 2.6 – North End Creek and Small Lake Basins • Figure 2.7 – South End Creek and Small Lake Basins • *Volume 3, Section 3.4* – BMP Selection for Flow Control • *Volume 3, Section 4.1* – Sizing Approach

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

At the time this Manual was developed, there was one public combined sewer basin that 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/dpd/codesrules/codes/stormwater).

Stormwater Code Language	References
SMC 22.805.050.C.5 – 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.B.4 (Peak Control Standard) if the total new plus replaced hard surface is 10,000 square feet or more.	• *Volume 1, Section 5.3.4* (SMC, Section 22.805.080.B.4) – Peak Control Standard • Figure 2.8 – Public Combined Sewer Basins • *Volume 3, Section 3.4* – BMP Selection for Flow Control • *Volume 3, Section 4.1* – Sizing Approach

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

Stormwater Code Language	References
SMC 22.805.050.C.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.B.4 (Peak Control Standard) if the total new plus replaced hard surface is 2,000 square feet or more. *SMC 22.801.040 – "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.	• *Volume 1, Section 4.4.3.1* (SMC, Section 22.805.050.C.1) – Discharges to Wetlands • *Volume 1, Section 4.4.3.2* (SMC, Section 22.805.050.C.2) – Discharges to Listed Creek Basins • *Volume 1, Section 4.4.3.3* (SMC, Section 22.805.050.C.3) – Discharges to Non-listed Creek Basins • *Volume 1, Section 4.4.3.4* (SMC, Section 22.805.050.C.4) – Discharges to Small Lake Basins • *Volume 1, Section 4.4.3.5* (SMC, Section 22.805.050.C.5) – Discharges to Public Combined Sewer • *Volume 1, Section 5.3.4* (SMC, Section 22.805.080.B.4) – Peak Control Standard • *Volume 3, Section 3.4* – BMP Selection for Flow Control • *Volume 3, Section 4.1* – Sizing Approach

4.4.3.7. Parcel-based Projects Discharging Groundwater- Flow Control

Stormwater Code Language	References
SMC 22.805.050.C.7 – 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.B.4 (Peak Control Standard) if the total new plus replaced hard surface is 2,000 square feet or more.	• SMC, Section 22.805.050.C.7 – Discharges from Groundwater

4.4.4. Water Quality Treatment

Stormwater Code Language	References
SMC 22.805.050.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: *1. The total new plus replaced pollution-generating hard surface is 5,000 square feet or more; or* *2. The total new plus replaced pollution-generating pervious surfaces is 3/4 acres or more, and from the project there is a surface discharge in a natural or man-made conveyance system from the site.*	• SMC, Section 22.805.090 – Minimum Requirements for Treatment • *Volume 1, Section 5.4* (SMC, Section 22.805.090) – Water Quality Treatment • *Volume 3, Section 3.5* – BMP Selection for Water Quality Treatment • *Volume 3, Section 4.1* – Sizing Approach

4.5. Utility Projects

Stormwater Code Language	References
SMC 22.800.040.A.2.a – Maintenance, repair, or installation of underground or overhead utility facilities, such as, but not limited to, pipes, conduits and vaults, and that includes replacing the ground surface with in-kind material or materials with similar runoff characteristics 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), except as modified as follows: *1. Installation of a new or replacement of an existing public drainage system, public combined sewer, or public sanitary sewer in the public right-of-way shall comply with Section 22.805.060 (Minimum Requirements for Roadway Projects) when these activities are implemented as publicly bid capital improvement projects funded by Seattle Public Utilities; and* *2. Installation of underground or overhead utility facilities that are integral with and contiguous to a road-related project shall comply with Section 22.805.060 (Minimum Requirements for Roadway Projects).*	• *Volume 1, Chapter 5* (SMC, Section 22.805.020) – Minimum Requirements for All Projects

4.6. Pavement Maintenance Projects

Stormwater Code Language	References
SMC 22.800.040.A.2.b – Pavement maintenance practices limited to the following activities are not required to comply with Section 22.805.060 (Minimum Requirements for Roadway Projects), 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): *1. Pothole and square cut patching;* *2. Overlaying existing asphalt or concrete or brick pavement with asphalt or concrete without expanding the area of coverage;* *3. Shoulder grading;* *4. Reshaping or regrading drainage ditches;* *5. Crack sealing; and* *6. Vegetation maintenance.*	• *Volume 1, Chapter 5* (SMC, Section 22.805.020) – Minimum Requirements for All Projects

4.7. WSDOT Projects

Stormwater Code Language	References
SMC 22.800.040.A.6 – 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). *a. 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.* *b. WSDOT shall comply with standards identified in watershed action plans for WSDOT rights-of-way, to the extent required by state law.* *c. 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.*	• *Volume 1, Section 4.3* (SMC, Section 22.805.060) – Minimum Requirements for Roadway Projects • WSDOT Highway Runoff Manual • WAC, Sections 173-270-030(1) and (2) – Best Management Practices – Approved Manual Required and Amendments to Manual • WAC, Sections 173-270-030(3)(b) and (c) – More Stringent Standards • SMC, Chapter 25.09 – Environmentally Critical Areas

4.8. Special Circumstances

Some projects do not closely fit defined project types and, therefore, require a case-by-case review to determine the applicable minimum requirements. These projects shall first go through a pre-permit review process to assist the proponent in identifying the specific minimum requirements to be applied. 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 basins
- Draining into more than one basin
- Multiple blocks or a subdivision
- Railroads
- Work performed in more than one jurisdiction

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 shall 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. This requirement applies to the four primary project types (single-family residential, trail and sidewalk, parcel-based, and roadway projects). General soil amendment requirements included in SMC, Section 22.805.030, Section 22.805.040, Section 22.805.050, and Section 22.805.060 are summarized below.

Stormwater Code Language	References
SMC, Section 22.805.030.A; SMC, Section 22.805.040.A; SMC, Section 22.805.060.A – 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.	• *Volume 3, Section 5.1* – Soil Amendment BMP

5.2. On-site Stormwater Management

Projects triggering this minimum requirement shall 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.

Stormwater Code Language	References
SMC, Section 22.805.070 – *A. Applicability. The requirements of this subsection 22.805.070 apply as required in Section 22.805.030 to Section 22.805.060.* *B. 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:* *1. Comply with either:* *a. Subsection 22.805.070.C (On-site Performance Standard); or* *b. Subsection 22.805.070.D (On-site Lists).*	• *Volume 1, Section 4.1* – Single Family Residential Projects • *Volume 1, Section 4.2* – Trail and Sidewalk Projects • *Volume 1, Section 4.3.2* – On-site Stormwater Management for Roadway Projects • *Volume 1, Section 4.4.2* – On-site Stormwater Management for Parcel-Based Projects • *Volume 1, Section 5.2.1* (SMC, Section 22.805.070.C) – On-site Performance Standard • *Volume 1, Section 5.2.2* (SMC, Section 22.805.070.D) – On-site Lists • *Volume 3, Section 3.3* – BMP Selection for On-site Stormwater Management • *Volume 3, Section 4.1* – Sizing Approach • *Volume 3, Section 5.1* – Soil Amendment BMP • *Volume 3, Section 5.2* – Tree Planting and Retention • *Appendix C* – On-site Stormwater Management Infeasibility Criteria

Projects triggering this minimum requirement shall 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 the following:

- On-site Performance Standard per Section 5.2.1, or
- On-site Lists per Section 5.2.2.

5.2.1. On-site Performance Standard

Stormwater Code Language	References
SMC 22.805.070.C – 1. *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:* a. *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.* 2. *For all other projects:* a. *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.*	• *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

5.2.2. On-site Lists

Stormwater Code Language	References
SMC 22.805.070.D – 1. *For each project surface, follow the appropriate project table in subsection 22.805.070.D.2 to subsection 22.805.070.D.5 to evaluate on-site BMPs shown for that type of surface, by category. All on-site BMPs used must comply with the rules promulgated by the Director. For each surface, consider all of 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 22.805.70.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 and the rules promulgated by the Director; and* b. *Competing Needs: Subsection 22.805.070.D (On-site Lists) can 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*	• *Volume 3, Section 3.3.1* – On-site List Approach • *Volume 3, Section 4.1.1* – On-site List Approach • *Appendix C* – On-site Stormwater Management Infeasibility Criteria

Stormwater Code Language	References
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 single-family residential projects, Table A for 22.805.070 applies.* *3. For trail and sidewalk projects, Table B for 22.805.070 applies.* *4. For parcel-based projects, Table C for 22.805.070 applies.* *5. For roadway projects, Table D for 22.805.070 applies.*	• *Volume 3, Section 3.3.1* – On-site List Approach • *Volume 3, Section 4.1.1* – On-site List Approach • *Appendix C* – On-site Stormwater Management Infeasibility Criteria

5.2.2.1. Single-family Residential Projects

Table A for 22.805.070. On-site List for Single-family Residential Projects.

Category	BMPs	All Discharge Locations
1	Full Dispersion	R, S
	Infiltration Trenches	R, S
	Dry Wells	R, S
2	Rain Gardens[a]	R, S
	Infiltrating Bioretention	R, S
	Rainwater Harvesting	X
	Permeable Pavement Facilities	R, S
	Permeable Pavement Surfaces	S
3	Sheet Flow Dispersion	R, S
	Concentrated Flow Dispersion	S
	Splashblock Downspout Dispersion	R
	Trench Downspout Dispersion	R
	Non-infiltrating Bioretention	R, S
	Vegetated Roofs	X
4	Single-family Residential Cisterns	R
	Perforated Stub-out Connections	R
	Newly Planted Trees	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.

BMPs – Best Management Practices

R = Evaluation is required for all roof runoff from Single-family residential projects.

S = Evaluation is required for all surfaces of Single-family residential projects.

X = Evaluation is not required but is allowed.

[a] Installation is only allowed for projects with less than 5,000 square feet of hard surface infiltrating on the project site.

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,[d] or its Basin	Projects Discharging to a Public Combined Sewer or Capacity Constrained System,[c] or its Basin	Projects Discharging to a Designated Receiving Water, or its Basin
1	Full Dispersion	S	S	S
2	Rain Gardens	S	S	X
	Permeable Pavement Surfaces	X	X[a]	X[a, b]
	Permeable Pavement Facilities	S	S[a]	X[a, b]
3	Sheet Flow Dispersion	S	S	S
	Concentrated Flow Dispersion	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.

BMPs – Best Management Practices

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

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

[a] Minimum permeable pavement area allowed in right-of-way is 2,000 square feet of pavement within the project site.

[b] 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.

[c] Does not include any project discharging to a receiving water not designated by Section 22.801.050 (e.g., wetlands, creeks, and small lakes), or its basin, even if the project discharges to a capacity-constrained system or its basin.

[d] Includes wetlands, creeks, and small lakes.

5.2.2.3. Parcel-based Projects

Table C 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,[d] a 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	R, S
	Dry Wells	R, S	R, S
2	Rain Gardens	R[a], S[a]	R[a], S[a]
	Infiltrating Bioretention	R, S	R, S
	Rainwater Harvesting	R[b]	X
	Permeable Pavement Facilities	R, S	R, S
	Permeable Pavement Surfaces	S	S
3	Sheet Flow Dispersion	R, S	R, S
	Concentrated Flow Dispersion	S	S
	Splashblock Downspout Dispersion	R	R
	Trench Downspout Dispersion	R	R
	Non-infiltrating Bioretention	R, S	R, S
	Vegetated Roofs	R[c]	X
4	Perforated Stub-out Connections	R	R
	Newly Planted 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.

BMPs – Best Management Practices

R = Evaluation is required for roof runoff from parcel-based projects, unless otherwise noted below.

S = Evaluation is required for all surfaces of parcel-based projects, unless otherwise noted below.

X = Evaluation is not required but is allowed.

[a] Installation is only allowed for projects not required to meet Section 22.805.080 (Minimum Requirements for Flow Control) or Section 22.805.090 (Minimum Requirements for Treatment) and with less than 5,000 square feet of hard surface infiltrating on the project site.

[b] Evaluation is not required for projects with less than 10,000 square feet of new plus replaced rooftop surface.

[c] Evaluation is not required for projects with less than 5,000 square feet of new plus replaced rooftop surface.

[d] Includes wetlands, creeks, and small lakes.

5.2.2.4. Roadway Projects

Table D for 22.805.070. On-site List for Roadway Projects.

Category	BMPs	Projects Discharging to a Receiving Water Not Designated by Section 22.801.050,[h] or its Basin	Projects Discharging to a Public Combined Sewer or Capacity Constrained System,[g] or its Basin	Projects Discharging to a Designated Receiving Water Basin
1	Full Dispersion	S	S	S
2	Rain Gardens	S[a]	S[a]	S[a]
	Infiltrating Bioretention	S	S[b]	S[b, c]
	Permeable Pavement Facilities	X[d]	X[e, f]	X[c, e, f]
	Permeable Pavement Surfaces	S[d]	S[e, f]	S[c, e, f]
3	Sheet Flow Dispersion	S	S	S
	Concentrated Flow Dispersion	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.

BMPs – Best Management Practices

PGIS – Pollution generating impervious surface

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

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

[a] Installation is only allowed for projects not required to meet Section 22.805.080 (Minimum Requirements for Flow Control) or Section 22.805.090 (Minimum Requirements for Treatment) and with less than 5,000 square feet of hard surface infiltrating on the project site.

[b] 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.

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

[d] Evaluation of roadway surfaces is not required, and installation is not allowed, if roadway is an arterial street/collector.

[e] Evaluation of roadway surfaces, including alleys, is not required and installation is not allowed.

[f] Minimum permeable pavement area allowed in right-of-way is 2,000 sf of pavement within the project site.

[g] Does not include any project discharging to a receiving water not designated by Section 22.801.050 (e.g., wetlands, creeks, and small lakes), or its basin, even if the project discharges to a capacity-constrained system or its basin.

[h] Includes wetlands, creeks, and small lakes.

5.3. Flow Control

Projects triggering this minimum requirement shall 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 *Section 5.3.1* through *5.3.4* for specific flow control standards for wetland protection, pre-developed forested, pre-developed pasture, and peak control.

Stormwater Code Language	References
SMC, Section 22.805.080 – *A. Applicability: The requirements of this subsection apply to the extent required in Section 22.805.050 to Section 22.805.060.* *B. 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 Section 22.805.070.D 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 provides substantially equivalent environmental protection as facilities not using on-site BMPs that receive flows from all of the portion of the site being developed.*	• *Volume 1, Section 4.3.3* – Minimum Requirements for Flow Control for Roadway Projects • *Volume 1, Section 4.4.3* – Minimum Requirements for Flow Control for Parcel-Based Projects • *Volume 1, Section 5.3.1* – Wetland Protection Standard • *Volume 1, Section 5.3.2* – Pre-developed Forested Standard • *Volume 1, Section 5.3.3* – Pre-developed Pasture Standard • *Volume 1, Section 5.3.4* – Peak Control Standard

Note:

- If a project requires compliance with the Peak Control Standard and either the Pre-developed Forested or Pre-developed Pasture Standard apply, the facility shall be sized to the standard that results in the largest facility (i.e., to meet the more stringent of the requirements).
- 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 utilized to the maximum extent feasible.
- If an infiltration basin or any detention BMPs are used, all of the new and replaced hard surface area shall be managed except as detailed in Volume 3, Section 4.2.2.3.
- When off-site flows cannot feasibly bypass proposed flow control BMPs, the flow control BMPs shall 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*).

Excerpts from the Stormwater Code (in italics) are presented below in the first column in each section. The second column in each section provides applicable references.

5.3.1. Wetland Protection Standard

Stormwater Code Language	References
SMC 22.805.080.B.1 – Wetland Protection Standard. 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. The total volume of stormwater discharging into a wetland shall not be more than: • *During a single precipitation event, 20 percent higher or lower than the pre-project volume, and* • *On a monthly basis, 15 percent higher or lower than the pre-project volume.* *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. If one or more of the flow control requirements contained in 22.805.080.B.2 through 22.805.080.B.4 also apply to the project, an analysis shall be conducted to ensure that the functions and values of the affected wetland are protected before implementing these flow control requirements. Projects triggering this requirement shall refer to Guide Sheets #1 through #3 presented in Appendix I-D of Ecology's Stormwater Management Manual for Western Washington (Ecology 2014) for additional guidance. Notwithstanding any provision in this subtitle, no net loss of wetland functions of values shall result from actions regulated by this subtitle.*	• SMC, Section 22.805.080.B.2 – Pre-developed Forested Standard • SMC, Section 22.805.080.B.3 – Pre-developed Pasture Standard • SMC, Section 22.805.080.B.4 – Peak Control Standard • *Volume 1, Section 3.7* – Protect Wetlands • Guide sheets 1 through 3 in the SWMMWW Volume I, Appendix I-D) (Ecology 2014)

5.3.2. Pre-developed Forested Standard

Stormwater Code Language	References
SMC 22.805.080.B.2 – 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 50 percent of the 2-year peak flow to the 50-year peak flow.	• *Volume 3, Section 3.4* – BMP Selection for Flow Control • *Volume 3, Section 4.1* – Sizing Approach • *Appendix F* – Hydrologic Analysis and Design

5.3.3. Pre-developed Pasture Standard

Stormwater Code Language	References
SMC 22.805.080.B.3 – The post-development discharge durations 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.	• *Volume 3, Section 3.4* – BMP Selection for Flow Control • *Volume 3, Section 4.1* – Sizing Approach • *Appendix F* – Hydrologic Analysis and Design

5.3.4. Peak Control Standard

Stormwater Code Language	References
SMC 22.805.080.B.4 – The post-development peak flow with a 4 percent annual probability (25-year recurrence flow) shall not exceed 0.4 cubic feet per second per acre. Additionally, the peak flow with a 50 percent annual probability (2-year recurrence flow) shall not exceed 0.15 cubic feet per second per acre.	• *Volume 3, Section 3.4* – BMP Selection for Flow Control • *Volume 3, Section 4.1* – Sizing Approach • *Appendix F* – Hydrologic Analysis and Design

5.4. Water Quality Treatment

Projects triggering this minimum requirement based on the amount of pollution generating surface shall 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 utilized to the maximum extent feasible.
- Refer to Volume 3, Section 4.4 for applicable presettling and pretreatment requirements.

Stormwater Code Language	References
SMC, Section 22.805.090 – *A. Applicability. The requirements of this subsection apply to the extent required in Section 22.805.050 to Section 22.805.060.* *B. 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 impervious 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 Section 22.805.070.D to the maximum extent feasible to meet the minimum requirements.*	• *Volume 1, Section 4.3.4* – Treatment Requirements for Roadway Projects • *Volume 1, Section 4.4.4* – Treatment Requirements for Parcel-Based Projects • *Volume 1, Section 5.4.1.1* – Runoff Treatment Volume • *Volume 1, Section 5.4.1.2* – Runoff Treatment Rates • *Volume 1, Section 5.4.1.3* – Infiltration Treatment Requirements • *Volume 3, Section 4.4* – Presettling and Pretreatment Requirements

Water quality treatment BMPs shall 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:

Stormwater Code Language	References
SMC, Section 22.805.090.B.1.a – 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.	• *Volume 1, Section 5.4.1.3* – Infiltration Treatment Requirements • *Volume 3, Section 4.1* – Sizing Approach • *Appendix F* – Hydrologic Analysis and Design

5.4.1.2. Runoff Treatment Rates

Stormwater Code Language	References
SMC, Section 22.805.090.B.1.b – Different design flow rates are required depending on whether a treatment facility will be located upstream or downstream of a detention facility: 1. *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.* 2. *For facilities located downstream of detention, the design flow rate is the release rate shall be the full 2-year release rate, as determined using an approved continuous runoff model.*	• *Volume 3, Section 4.1* – Sizing Approach • *Appendix F* – Hydrologic Analysis and Design

5.4.1.3. Infiltration Treatment Requirements

Stormwater Code Language	References
SMC, Section 22.805.090.B.1.c – 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.	• *Volume 1, Section 5.4.1.1* – Runoff Treatment Volume • *Volume 3, Section 4.1* – Sizing Approach • *Volume 3, Section 4.4* – Presettling and Pretreatment Requirements • *Appendix F* – Hydrologic Analysis and Design

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 shall install water quality treatment BMPs for the given project type, size, and discharge location as summarized in Chapter 2. Refer to Section 5.4.2.1 through 5.4.2.4 for Oil, Phosphorus, Enhanced, and Basic water quality treatment standards

When triggered, water quality treatment BMPs shall 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 shall be sized for the combined total flow. Direct discharge of untreated drainage water to groundwater is prohibited (SMC, Section 22.805.090.B.6).

Excerpts from the Stormwater Code (in italics) are presented below in the first column in each section. The second column in each section provides applicable references.

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, enhanced, or basic). The petroleum storage and transfer criterion is intended to address regular transfer operations such as gasoline service stations.

The project proponent shall develop an ADT estimate for approval by the City (www.seattle.gov/transportation/tfdmaps.htm). In addition to the typical sites outlined in the definition for 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.

Stormwater Code Language	References
SMC, Section 22.805.090.B.3 – An oil control treatment facility shall be required for high-use sites, as defined in 22.801.090. *SMC, Section 22.801.090 – "High-use sites" means sites that typically generate high concentrations of oil due to high traffic turnover or the frequent transfer of oil. High-use sites include:* *1. 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;* *2. 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;* *3. 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.);* *4. 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.*	• *Volume 3, Section 3.5* – BMP Selection for Water Quality Treatment

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 ¼ mile of a nutrient-critical receiving water or a tributary to that water.

At the time this Manual was developed, there were no nutrient-critical receiving water segments determined to be impaired due to phosphorus contributed by stormwater. In the future, the City may designate a waterbody as a 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/dpd/codesrules/codes/stormwater/).

Stormwater Code Language	References
SMC, Section 22.805.090.B.4 – A phosphorus treatment facility shall be required for projects discharging into nutrient-critical receiving waters.	• *Volume 3, Section 3.5* – BMP Selection for Water Quality Treatment • *Volume 3, Section 4.4.3.2* – Pretreatment

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

5.4.2.3. Enhanced Treatment

The requirement to provide enhanced treatment is determined by the discharge location of the project and activities occurring on the project site.

Stormwater Code Language	References
SMC, Section 22.805.090.B.5 – Enhanced Treatment. An enhanced treatment facility for reducing concentrations of dissolved metals shall be 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 one-quarter 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: *a. For a parcel-based project, the site is an industrial, commercial, or multi-family project.* *b. For a roadway project, the site is either:* *1. A fully controlled or a partially controlled limited access highway with Annual Average Daily Traffic counts of 15,000 or more; or* *2. Any other road with an Annual Average Daily Traffic count of 7,500 or greater.*	• *Volume 3, Section 3.5* – BMP Selection for Water Quality Treatment • *Volume 3, Section 4.4.3.2* – Pretreatment

Sites that discharge directly (or, indirectly through a drainage system) to a Basic Treatment Receiving Water (*Section 5.4.2.4*) are not subject to enhanced treatment requirements. Likewise, any portion of a project site that is identified as subject to basic treatment requirements only (*Section 5.4.2.4*) are not subject to enhanced treatment requirements.

Project sites subject to the enhanced treatment requirement could also be subject to the oil treatment requirement (*Section 5.4.2.1*), and phosphorus treatment requirement if discharging to a nutrient-critical receiving water (*Section 5.4.2.2*).

5.4.2.4. Basic Treatment

Projects triggering water quality treatment shall install, at a minimum, a facility that meets the basic treatment requirements. The requirements for Oil Control Treatment, Phosphorus Treatment, and Enhanced Treatment are in addition to the basic treatment requirement.

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 – and the discharge is within 1/4 mile of a nutrient-critical receiving water (refer to *Section 5.4.2.2*), or
  - The project site is required to provide Enhanced Treatment (refer to *Section 5.4.2.3*).
- Single-family residential projects not otherwise required to provide phosphorus control (*Section 5.4.2.2*) as designated by EPA, Ecology, or the City.
- Project sites discharging directly (or indirectly through a drainage system) to the following Basic Treatment Receiving Waters:
  - All marine waters
  - Lake Union
  - Lake Washington
  - Ship Canal and bays between Lake Washington and Puget Sound
  - 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, the City of Seattle interprets "fresh waters designated for aquatic life use" to include at minimum fresh water wetlands as well as small lakes, creeks, and freshwater designated receiving waters.
- Landscaped areas of industrial, commercial, and multi-family project sites
- Parking lots of industrial and commercial project sites, dedicated solely to parking of employees' private vehicles that do not involve any other pollution-generating activities (e.g., industrial activities; customer parking; storage of erodible or leachable material, wastes, or chemicals; vehicle maintenance).

Stormwater Code Language	References
SMC, Section 22.805.090.B.2 – A basic treatment facility shall be required for all projects. The requirements of subsection 22.805.090.B.3 (Oil Control Treatment), subsection 22.805.090.B.4 (Phosphorus Treatment), subsection 22.805.090.B.5 (Enhanced Treatment) are in addition to this basic treatment requirement.	• *Section 5.4.1* (SMC, Section 22.805.090.B.3) – Oil Control Treatment • *Section 5.4.2* (SMC, Section 22.805.090.B.4) – Phosphorus Treatment • *Section 5.4.3* (SMC, Section 22.805.090.B.5) – Enhanced Treatment • *Volume 3, Section 3.5* – BMP Selection for Water Quality Treatment • *Volume 3, Section 4.1* – Sizing Approach • *Appendix F* – Hydrologic Analysis and Design

Note that in addition to basic treatment, oil control treatment may also be required if the project includes "high-use sites." Refer *Section 5.4.2.1*.

CHAPTER 6 – ALTERNATIVE COMPLIANCE

Stormwater Code Language	References
SMC 22.800.080 – Authority *The Director of SPU is authorized, to the extent allowed by law:* *E. 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. (SMC 22.800.080.E)* *F. To enter into an agreement with the developer of a project for the developer to voluntarily contribute funds toward the construction of one or more drainage control facilities that mitigate the impacts to the same receiving water that have been identified as a consequence of the proposed development. (SMC 22.800.080.F)* *G. To enter into an agreement with the developer of a project for the developer to voluntarily construct one or more drainage control facilities at an alternative location, determined by the Director, to mitigate the impacts to the same receiving water that have been identified as a consequence of the proposed development. (SMC 22.800.080.G)*	• Not applicable

When the consequences of the proposed development are from new impervious 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 impervious 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 – SITE ASSESSMENT AND PLANNING

To help evaluate minimum requirements and start the process for selecting on-site stormwater management, flow control, and water quality treatment BMPs, each project shall assess and evaluate existing and post-development site conditions. This chapter describes typical site information and design considerations to be identified early in the project development process. The goal of site assessment and planning is to identify any additional stormwater management issues that shall be addressed before selecting on-site stormwater management, flow control, and/or water quality treatment BMPs. Additional information on drainage control reviews and required plan submittals is included in Chapter 8.

7.1. 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 as part of the site assessment and planning step.

7.1.1. Project Boundaries and Structures

Project boundaries, nearby structures, and other related issues can directly affect stormwater designs. The following shall 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 and/or property line.
- Setbacks: Property lines, existing and proposed structures, and adjacent right-of-way boundaries shall be identified and considered to evaluate project impacts on adjacent properties.
- Location of Buildings: All existing and proposed buildings shall be identified, including all existing and proposed temporary and permanent structures (such as retaining walls) and impervious surfaces (driveways, patios, etc.). 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, shall be determined, to include the following:
    - Conventional spread footings
    - Pile shaft
    - Basement
    - Footing drains and their associated point of discharge, where applicable
    - Water-tight foundation without footing drains
    - Elevation of groundwater table in relation to the footings and basement

7.1.2. Soil Condition Assessment

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

7.1.3. Environmentally Critical Areas (ECAs)

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

7.1.4. Dewatering

It is important to have early estimations of the groundwater discharge from the project site. The site's proximity 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 Requirement to Ensure Sufficient Capacity (*Section 3.8*).

If temporary dewatering shall occur, a Side Sewer Permit for Temporary Dewatering (SSPTD) and a Discharge Authorization Letter from King County Industrial Waste may be required prior to commencing dewatering at the site. The SSPTD permit may require compliance with a separate Temporary Dewatering Plan, water quality treatment, flow control requirements, and also require compliance monitoring.

7.1.5. Topography

Because topography will influence how and where stormwater BMPs are incorporated onto the site, the existing and proposed topography shall 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

7.2. Site Assessment

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

- **Topography**: Topography within 500 feet of the site (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, Above Ground Storage Tanks, Residential Heating Oil Tanks**: Location of underground storage tanks, above ground 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

For Roadway projects or Parcel-based projects with runoff from 5,000 square feet or more of impervious area infiltrated on the site, the following information shall 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
- **Groundwater Protection Areas**: Location of groundwater protection areas and/or 1-, 5-, and 10-year time of travel zones for municipal well protection areas
- **Anticipated Site Use**: Anticipated site use (street/highway, residential, commercial, high-use site that may affect the water quality of stormwater runoff)

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

- Regional geologic mapping
- Publicly available geotechnical exploration data
- Steep slope and landslide-prone areas within a quarter mile (1,320 feet) of proposed deep infiltration BMP location

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

Using the site assessment information, evaluate the site for infiltration suitability based on the limitations and setbacks provided in Volume 3, *Section 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 UIC wells, setback and site restrictions shall be in accordance with the UIC Guidance Manual (Ecology 2006).

7.3. Site Design Considerations

To manage stormwater effectively and efficiently, site design for both the construction phase and post-development condition should be done in unison with the design and layout of the stormwater infrastructure. Efforts should be made, as required and encouraged by local development codes, to conserve natural areas, retain native vegetation, 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 reduce 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 flow path, both pipe and topographically
  - Manage stormwater runoff (quantity and quality) as close to the point of origin as possible
  - Minimize the quantity of stormwater collection and conveyance systems required
  - Use simple, nonstructural methods for stormwater management
  - Use dispersion, infiltration, rainwater harvesting, and alternative surface BMPs where feasible
- Landscaping:
  - Maintain and use natural drainage patterns
  - Preserve and use natural features and resources, including trees
  - 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 minimize impacts to environmentally critical areas 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
- 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 porous soils by locating bioretention and permeable pavement over them.
  - Cluster buildings together
  - Minimize impervious surfaces (e.g., buildings, 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)

CHAPTER 8 – DRAINAGE CONTROL REVIEW AND APPLICATION REQUIREMENTS

Most construction projects in Seattle require a permit from the Seattle Department of Construction and Inspection (SDCI) and/or the Seattle Department of Transportation (SDOT). There are two levels of Drainage Control Review required for construction permits: Standard Drainage Review and Comprehensive Drainage Review. The type of Drainage Control Review required is based on the 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/dpd/codesrules/codes/stormwater).

Forms and submittal documents for projects conducted in the right-of-way can be found on SDOT's website (www.seattle.gov/transportation/stuse_sip.htm).

The City also has resources available at the SDCI Applicant Services Center, including SDCI staff available to answer questions, and relevant "Tips" with detailed information for construction projects. Visit the SDCI Applicant Services Center on the 20th floor of the Seattle Municipal Tower 700 Fifth Avenue, Seattle, Washington 98124, or the website (www.seattle.gov/dpd).

8.1. Standard Drainage Review

Standard Drainage Review generally applies to projects that involve 750 square feet or more, but less than 1 acre, of land-disturbing activity, and less than 5,000 square feet of new plus replaced hard surface. For a project with no offsite discharge point as determined by the Director, the drainage control plan shall be prepared by a licensed engineer (refer to *Volume 3*, *Section 4.3.2*).

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

- Construction Stormwater Control Plan (refer to *Volume 2 – Construction Stormwater Control*)
- Post Construction Soil Management Plan (refer to *Volume 3*, *Section 5.1*)
- 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.)
- On-site Stormwater Management BMPs and hard surface identification (see On-site Stormwater Management documentation below)
- Flow Control BMPs
- Water Quality Treatment BMPs
- Site Plan (elements can be incorporated within Drainage Control Plan)
  - Address of project and permit number
  - Creeks, streams, shorelines and any other Environmentally Critical Areas (ECAs)
  - 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)
  - Ground elevations, flow lines and tops and bottoms of slopes
  - Existing and proposed below grade and above grade utilities and infrastructure
  - Property line dimensions
  - Existing and proposed easements
  - Setbacks
- Maintenance instructions

- 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, Section 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, washpads).
  - An agreement to inform future purchasers/successors/assignees of the existence, limitations, and inspection and maintenance requirements of the stormwater control BMPs
  - 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

8.2. Comprehensive Drainage Review for Large Projects

Comprehensive Drainage Review is required for projects involving 5,000 square feet or more of new plus replaced impervious surface or 1 acre or more of land-disturbing activity, prepared by a licensed engineer. In addition to the requirements of the Standard Drainage Review, the following information is required for the Comprehensive Drainage Review:

- A Drainage Report including, at a minimum:
  - 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

- Water quality supporting calculations (if triggered)
- Drainage basin maps
- Inspection and O&M requirements and schedule

8.3. 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 / Boundary Survey (SMC, Section 25.09.330)
- Environmental Assessment for potentially contaminated sites
- Downstream Analysis
- Basin Analysis