

Chapter 3 Minimum Requirements for New Development and Redevelopment

This Chapter identifies the Minimum Requirements for stormwater management applicable to new development and redevelopment sites. These requirements are codified in Chapter 12.08 of the Tacoma Municipal Code (TMC). New development and redevelopment projects also may be subject to other City code requirements, depending on the nature and location of the project. These code requirements may include, but are not limited to, the subdivision and land use permit procedures in Chapters 13.04 and 13.05 TMC; excavation and grading and offsite improvement Chapter 2.02 TMC; driveway control Chapter 10.14 TMC; groundwater protection, Chapter 12.09 TMC; shoreline regulation, Chapter 13.10 TMC; and critical areas preservation Chapter 13.11 TMC.

3.1 Overview of the Minimum Requirements

The Minimum Requirements are:

1. Preparation of Stormwater Site Plans
2. Construction Stormwater Pollution Prevention
3. Source Control of Pollution
4. Preservation of Natural Drainage Systems and Outfalls
5. Onsite Stormwater Management
6. Runoff Treatment
7. Flow Control
8. Wetlands Protection
9. Basin/Watershed Planning
10. Operation and Maintenance

The City also has two additional requirements beyond those required in Ecology's 2005 Manual:

11. Offsite Analysis and Mitigation
12. Financial Liability

Depending on the type and size of the proposed project, different combinations of these Minimum Requirements apply. In general, small sites are required to control erosion and sedimentation from construction activities and to apply simpler approaches to treatment and flow control of stormwater runoff from the developed site. Large sites must provide erosion and sedimentation control during construction and permanent control of stormwater runoff from the developed site.

Section 3.4 provides additional information on applicability of the Minimum Requirements to different types of sites.

This manual is designed to be equivalent to Ecology's 2005 Stormwater Management Manual for Western Washington. Ecology considers its manual to include all known, available and reasonable methods of prevention, control, and treatment (AKART). Ecology's Manual has no independent regulatory authority. However, Ecology has required as a condition of the City's General Permit for Discharges from Municipal Separate Storm Sewers, the adoption of stormwater program components that are the substantial equivalent to the Minimum Requirements found in Ecology's 2005 Manual.

The Minimum Requirements of this Chapter are conditions of the City's stormwater NPDES permit, and are required under Tacoma's Municipal Code, Chapter 12.08 *Wastewater and Surface Water Management – Regulations and Rates*.

3.2 Exemptions

The following are exempt from complying with the Minimum Requirements. All other new development or redevelopment projects are subject to one or more of the Minimum Requirements (see Section 3.4).

3.2.1 Road Maintenance

The following road maintenance practices are exempt:

- Pothole and square cut patching
- Overlaying existing asphalt or concrete pavement with asphalt or concrete without expanding the area of coverage
- Shoulder grading
- Reshaping/regrading drainage systems
- Crack sealing
- Resurfacing with in-kind material without expanding the road prism
- Vegetation maintenance

3.2.2 Parking Lots and Parking Lot Maintenance

Parking lots are considered pollution generating impervious surfaces and must comply with all relevant Minimum Requirements. Parking lot surfacing material requirements are regulated through the City's Land Use code. No special consideration will be given to "temporary" parking areas as the impacts resulting from the proposed impervious surface must be mitigated as part of the construction.

The following parking lot maintenance practices are exempt:

- Pothole and square cut patching
- Overlaying existing asphalt or concrete pavement with asphalt or concrete without expanding the area of coverage
- Crack sealing
- Catch basin, pipe and vegetation maintenance

3.2.3 Underground Utility Projects

Underground utility projects that replace the ground surface with in-kind material or materials with similar runoff characteristics are only subject to Minimum Requirement #2, Construction Stormwater Pollution Prevention.

3.2.4 Minor Clearing and Grading

The following minor clearing and grading activities are exempt from all the Minimum Requirements except for Minimum Requirement #2; unless located within a critical or sensitive

area governed by the City's Critical Areas Preservation Ordinance. The location of Critical Areas can be found on the City's GovMe website located at: www.govme.org.

- Excavation for wells, except that fill made with the material from such excavation shall not be exempt;
- Exploratory excavations under the direction of soil engineers or engineering geologists, except that fill made with the material from such excavation shall not be exempt;
- Removal of hazardous trees;
- Removal of trees or other vegetation which cause sight distance obstructions at intersections as determined by the City of Tacoma traffic engineer;
- Minor clearing and grading associated with cemetery graves;
- Land clearing associated with routine maintenance by public utility agencies, as long as appropriate vegetation management practices are followed as described in the Best Management Practices of the Regional Road Maintenance Endangered Species Act Program Guidelines located at <http://www.wsdot.wa.gov/maintenance/roadside/esa.htm>

3.2.5 Emergencies

Emergency projects which, if not performed immediately would substantially endanger life or property, are exempt only to the extent necessary to meet the emergency. Emergency activities may include but are not limited to: sandbagging, diking, ditching, filling or similar work during or after periods of extreme weather. Permits authorizing the emergency work may be required after completion of the emergency project.

3.3 Applicability of the Minimum Requirements

NOTE: Throughout this Section, **requirements are written in bold print**. Supplemental guidelines that serve as advice and other materials are not bolded.

Not all of the Minimum Requirements apply to every development or redevelopment project. The applicability varies depending on the type and size of the project. This section identifies thresholds that determine the applicability of the Minimum Requirements to different projects. The thresholds shall be determined using the proposed improvements for the entire project site.

The Minimum Requirements shall be based on the most sensitive receiving waterbody along the discharge route. Environmental Services shall make the final determination of the applicability of the Minimum Requirements.

Runoff credits are considered when determining project thresholds for flow control requirements. The design criteria in this manual must be used in order to obtain runoff credits.

The flow charts in Figures 1 - 5, 1 - 6 and 1 - 7 are intended as guidance for determining Minimum Requirements. The figures do not provide a complete analysis of each Minimum Requirement. The applicant must review the text of each Minimum Requirement in order to determine the stormwater mitigation requirements for their project. The written text shall take precedence over the flowcharts.

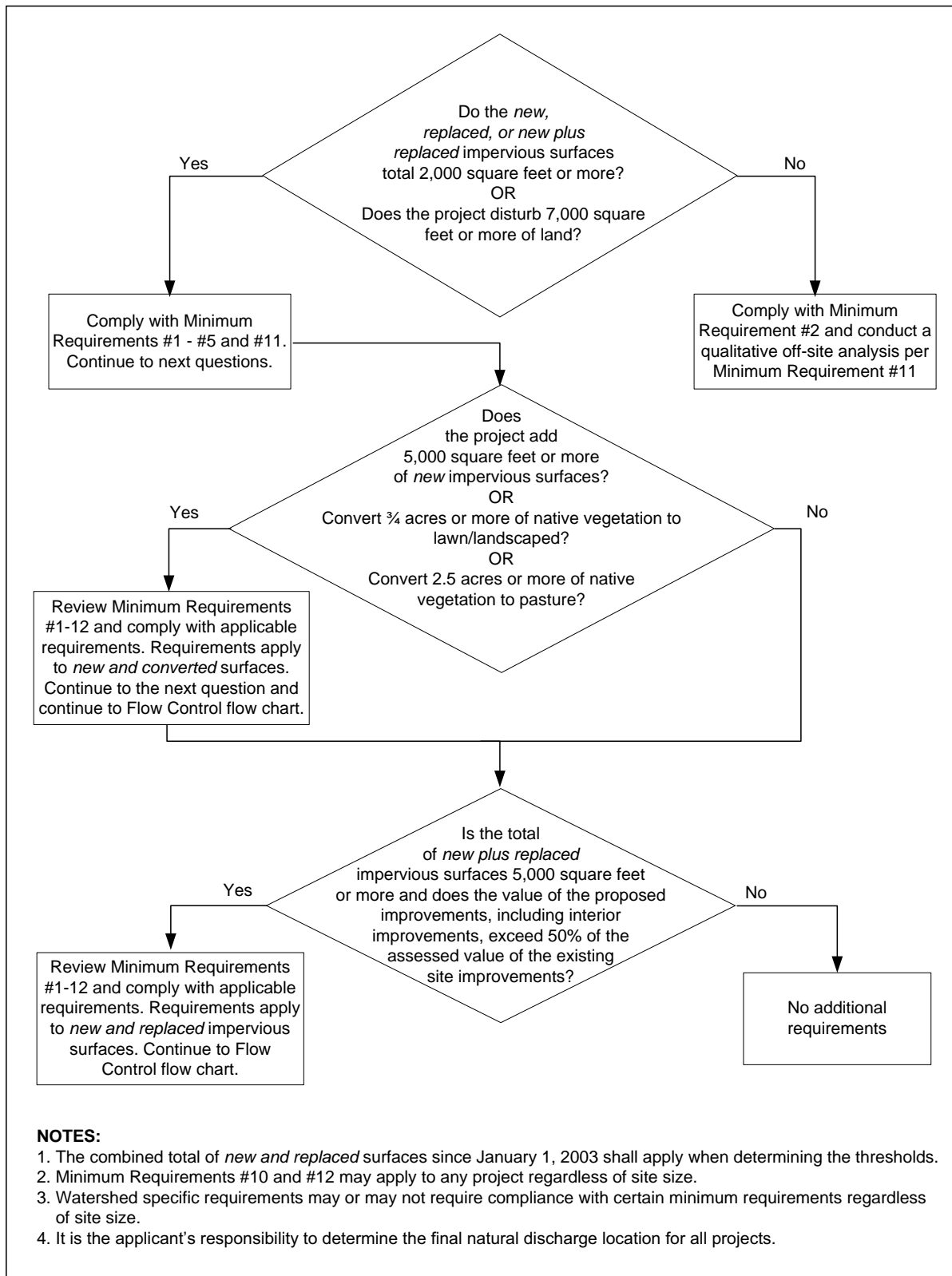


Figure 1 - 5. Determining Minimum Requirements for New and Redevelopment Project Sites

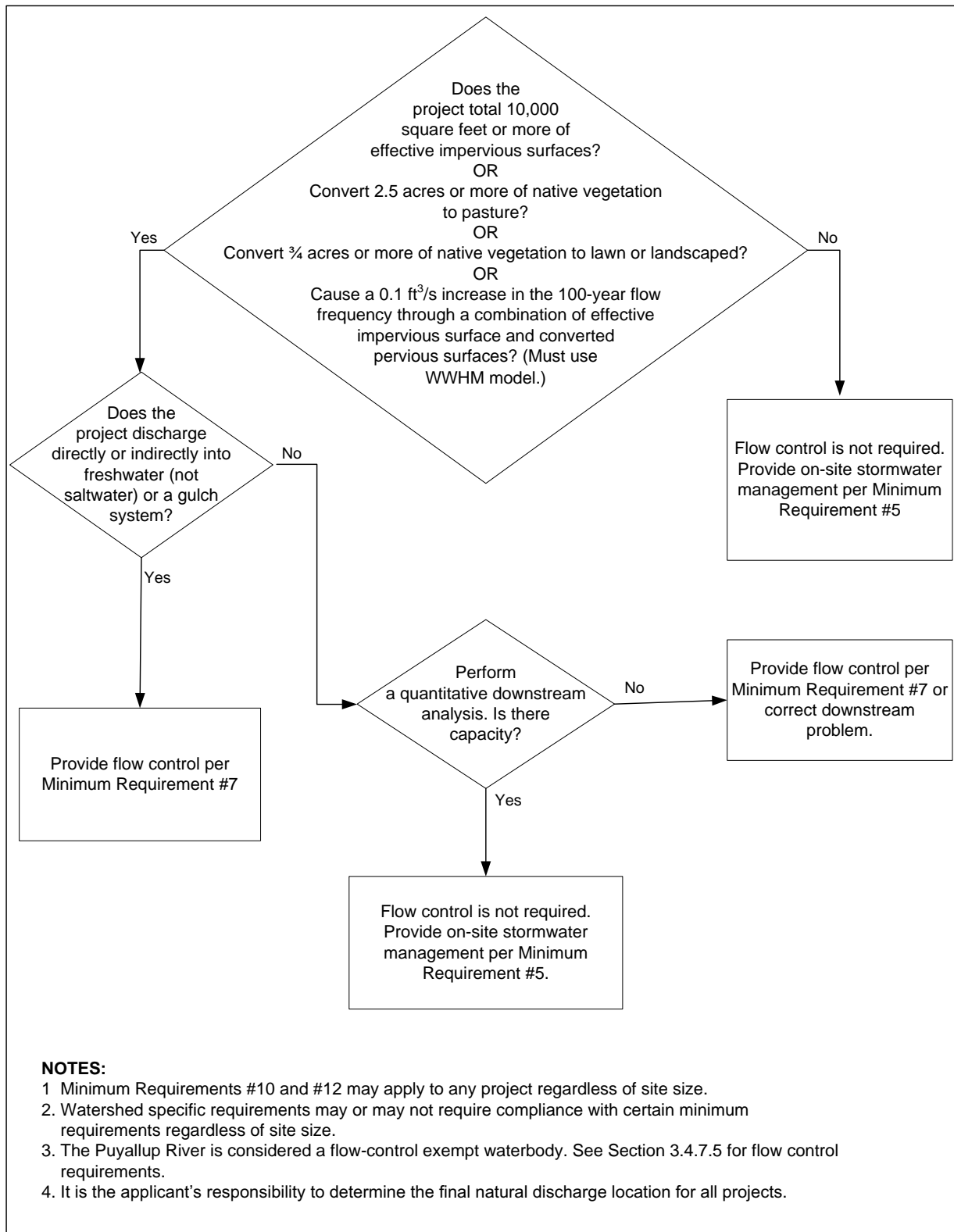


Figure 1 - 6. Determining Minimum Requirements for Flow Control

3.3.1 New Development

All new development shall be required to comply with Minimum Requirements #2 and #11. Minimum Requirements #10 and #12 may apply to any project.

The following new development shall comply with Minimum Requirements #1 through #5 for the new and replaced impervious surfaces and the land disturbed:

- Creates or adds 2,000 square feet, or greater, of new, replaced, or new plus replaced impervious surface area, or
- Has land disturbing activity of 7,000 square feet or greater.

The following new development shall comply with Minimum Requirements #1 through #10 for the new impervious surfaces and the converted pervious surfaces.

- Creates or adds 5,000 square feet , or more, of new impervious surface area, or
- Converts $\frac{3}{4}$ acres, or more, of native vegetation to lawn or landscaped areas, or
- Converts 2.5 acres, or more, of native vegetation to pasture.

3.3.2 Redevelopment

Redevelopment is development on a site that is already substantially developed (i.e. has 35% or more existing impervious surface coverage). See the Glossary at the back of this manual for definitions.

Redevelopment projects have the same requirements as new development projects in order to minimize the impacts from new surfaces. To not discourage redevelopment projects, replaced surfaces aren't required to be brought up to new stormwater standards unless the monetary thresholds noted in this section are exceeded. If the redevelopment project scope is sufficiently large such that the thresholds are exceeded, it is reasonable to require the replaced surfaces to be brought up to current stormwater standards.

All redevelopment shall be required to comply with Minimum Requirements #2 and #11. Minimum Requirements #10 and #12 may apply to any project regardless of size.

The following redevelopment shall comply with Minimum Requirements #1 through #5 for the new and replaced impervious surfaces and the land disturbed:

- The new, replaced, or total of new plus replaced impervious surfaces is 2,000 square feet or more, or
- 7,000 square feet or more of land disturbing activities.

In addition to meeting Minimum Requirements #1 through #5, the following redevelopment shall comply with Minimum Requirements #6 through #10 for the new impervious surfaces and converted pervious areas:

- Adds 5,000 square feet or more of *new* impervious surfaces or,
- Converts $\frac{3}{4}$ acres, or more, of native vegetation to lawn or landscaped areas, or
- Converts 2.5 acres, or more, of native vegetation to pasture.

In addition to meeting Minimum Requirements #1 through #12 for the *new* and *converted* surfaces, the following shall comply with all the Minimum Requirements for the *new*, *converted* and *replaced* impervious surfaces:

- **The total of new plus replaced impervious surfaces is 5,000 square feet or more and the valuation of the proposed improvements (materials plus labor to construct) - including interior improvements - exceeds 50% of the assessed value of the existing site improvements as determined from the latest available building valuation data published by the International Code Council, available at <http://www.iccsafe.org/>.**

The Building Valuation Data provided by the International Code Council may not include all improvements that can occur on a site. All site improvements must be included when determining if the improvements exceed 50% of the assessed value. These might include improvements such as parking lots, driveways, sport courts, swimming pools, etc. in addition to the valuation of any proposed or existing buildings.

3.3.3 Equivalent Areas

The City may allow the Minimum Requirements to be applied to an equivalent area (flow and pollution characteristics) within the same site. For public road projects, the equivalent area does not have to be within the project limits, but must drain to the same receiving water within the watershed. Environmental Services shall approve the use of equivalent areas.

3.3.4 Roads

All new/redevelopment shall be required to comply with Minimum Requirements #2 and #11. Minimum Requirements #10 and #12 may apply to any project regardless of site size. In addition, all new/redevelopment that exceeds certain thresholds shall be required to comply with the additional Minimum Requirements as follows.

The following new/redevelopment shall comply with Minimum Requirements #1 through #5 for the *new and replaced impervious surfaces* and the *land disturbed*:

- The new, replaced, or total of new plus replaced impervious surfaces is 2,000 square feet or more, or
- 7,000 square feet or more of land disturbing activities.

In addition to meeting Minimum Requirements #1 through #5, the following new/redevelopment shall comply with Minimum Requirements #6 through #10 for the *new impervious surfaces* and *converted pervious areas*:

- Adds 5,000 square feet or more of new impervious surfaces or,
- Converts 3/4 acres or more of native vegetation to pasture.

In addition to meeting Minimum Requirements #1 through #12 for the *new and converted surfaces*, the following road-related projects shall comply with all Minimum Requirements for the *new, converted and replaced impervious surfaces*:

- The total of the new impervious surfaces is 5,000 square feet or more and the new impervious surfaces add 50% or more to the existing impervious surfaces within the site.

See Figure 1 - 7. Determining the Minimum Requirements for Road-Related Projects.

The site shall be defined by the length of the project and the width of the right-of-way. Public road improvements (offsite improvements) required as part of a private development project will be considered part of the project site used for determining the project thresholds of the private project and shall not be considered road-related projects.

The following road maintenance practices are considered redevelopment. The extent to which the manual applies is explained for each circumstance.

- Removing and replacing a paved surface to base course or lower, or repairing the roadway base. These are considered replaced surfaces and are subject to the Minimum Requirements that are triggered when the thresholds for redevelopment are met.
- Extending the pavement edge without increasing the size of the road prism, or paving graveled shoulders: These are considered new impervious surfaces and are subject to the Minimum Requirements that are triggered when the thresholds identified for redevelopment projects are met.
- Resurfacing by upgrading from dirt to gravel, asphalt, or concrete; upgrading from gravel to asphalt or concrete; or upgrading from a bituminous surface treatment (“chip seal”) to asphalt or concrete. These are considered new impervious surfaces and are subject to the Minimum Requirements that are triggered when the thresholds identified for redevelopment projects are met.

3.3.5 Cumulative Impact Mitigation Requirement

The determination of thresholds for a project site shall be based on the total increase or replacement of impervious surfaces that occurred after adoption of the 2003 SWMM (January 1, 2003).

Under this provision, the City will consider the cumulative impacts of all permits issued on or after January 1, 2003. The combined total of new or replaced surfaces will be applied to the thresholds that determine applicability of the Minimum Requirements.

The intent of this Cumulative Impact Mitigation Requirement is to adequately mitigate the stormwater from improvements on a project site that are submitted under separate permits. The separate submittals could have project areas that do not meet the thresholds, but would meet the thresholds if the projects were combined as one project.

3.3.6 Grade and Fill Projects

Grade and fill projects are those projects that do not include clearing or adding or replacing impervious surfaces. Grade and fill projects require stormwater pollution prevention during grading and filling to protect downstream systems.

Projects grading/filling greater than 50 cubic yards of material are required to submit a Construction Stormwater Pollution Prevention Plan (SWPPP) per Volume 2 of this manual. Projects grading/filling between 50 and 499 cubic yards of material may submit a short form SWPPP as outlined in Volume 2, Appendix C. Projects grading/filling 500 cubic yards or more of material are required to submit a formal SWPPP per Volume 2.

3.3.7 Separation of Public and Private Water Quality and Flow Control

Typically, private and public stormwater are separated for purposes of water quality treatment and flow control. However, the City recognizes that this is not always practical. Therefore, the City has developed the following guidance:

- For commercial new development and redevelopment, typically public and private stormwater runoff shall be separated. The City may allow incidental amounts of private stormwater runoff to enter the City system with written approval from Environmental Services.

- Under certain circumstances, small amounts of public stormwater may be allowed to discharge to private flow control systems with written approval from Environmental Services. A written agreement between the City and owner, and Notice to Title may be required.
- For residential new development and redevelopment, for areas adjacent to public roads, such as driveways, the City will typically allow driveway runoff to drain to the street if onsite management is not feasible, and the amount of driveway is small compared to public road with written approval from Environmental Services. Private accessway runoff shall be handled in separate private water quality and/or flow control devices.

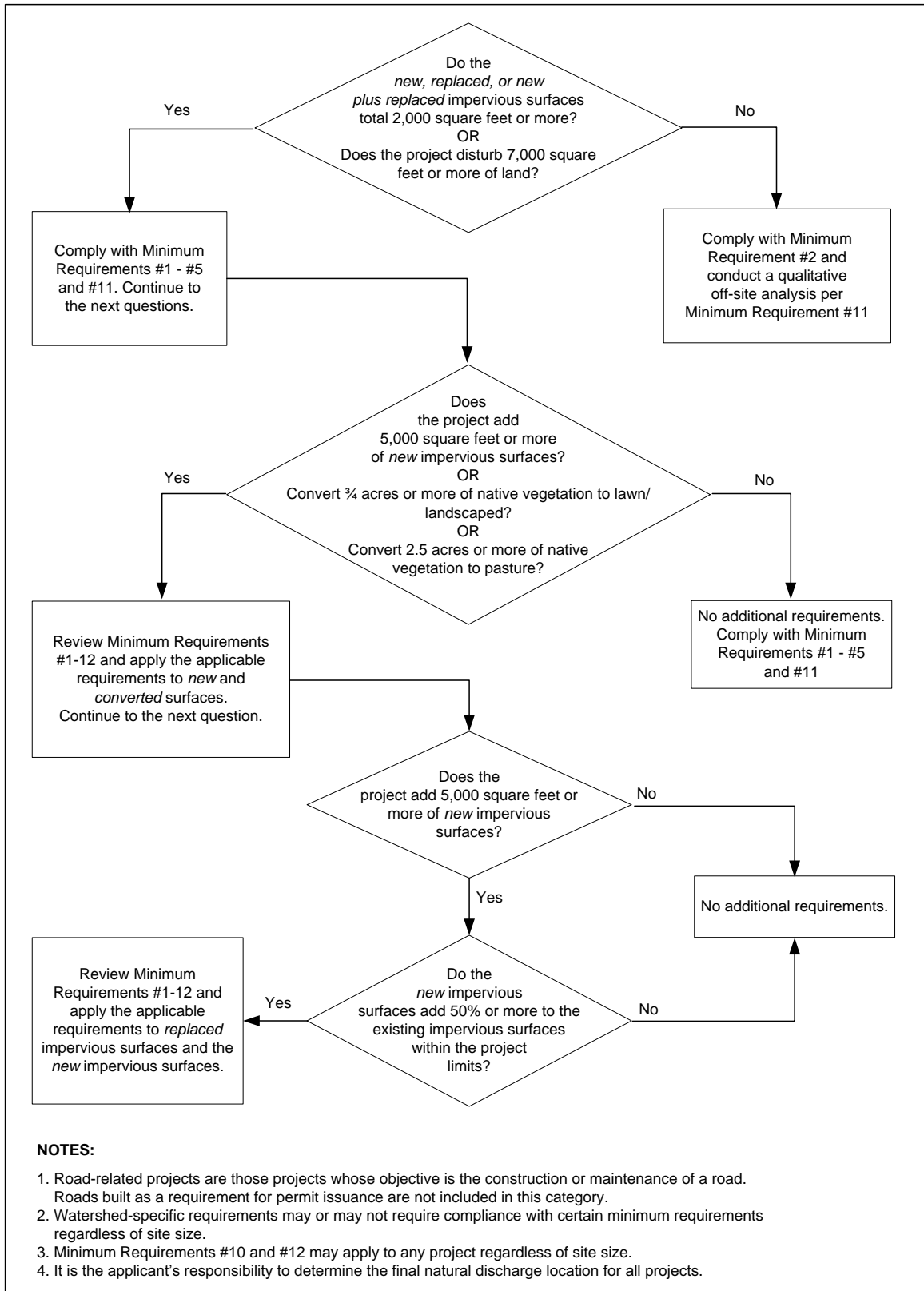


Figure 1 - 7. Determining Minimum Requirements for Road-Related Projects

3.4 Description of Minimum Requirements

NOTE: Throughout this Section, **requirements are written in BOLD print**. Supplemental guidelines that serve as recommendations and other materials are not written in bold.

This section describes the Minimum Requirements for stormwater management at new development and redevelopment sites. Consult Section 3.3 to determine which requirements apply to any given project.

Volumes 2 through 6 of this manual present Best Management Practices (BMPs) for use in meeting the Minimum Requirements.

3.4.1 Minimum Requirement #1: Preparation of a Stormwater Site Plan

All projects meeting the thresholds in Section 3.3 shall prepare a Stormwater Site Plan for Environmental Services review. Stormwater Site Plans shall be prepared in accordance with Chapter 4 of this Volume.

A Stormwater Site Plan consists of an assessment of both temporary and permanent stormwater and drainage impacts.

3.4.1.1 Objective

To outline the existing and post-developed conditions of the project site, describe the proposed stormwater facilities, and present the stormwater analysis.

3.4.2 Minimum Requirement #2: Construction Stormwater Pollution Prevention (SWPP)

All new development and redevelopment shall comply with Construction SWPP Elements #1 through #12. A full description of these elements can be found in Volume 2 – Chapter 2.

Projects which meet or exceed the thresholds of Volume 1, Section 3.3 must prepare a Construction Stormwater Pollution Prevention Plan (SWPPP). Each of the twelve elements must be considered and included in the Construction SWPPP unless site conditions render the element unnecessary and the exemption from that element is clearly justified in the narrative of the SWPPP.

The City has developed a Construction SWPPP Short Form which is available in Volume 2, Appendix C. The form may be used for projects that:

- **Add or replace between 2,000 and 5,000 square feet of impervious surface.**
- **Clear or disturb between 7,000 square feet and 1 acre of land.**
- **Grade/fill 50 - 499 cubic yards of material.**

If project quantities exceed any of the above thresholds, a formal Construction SWPPP as described in Volume 2, Chapter 2 must be prepared.

Unless located in a Critical Area, projects below the new and redevelopment thresholds are not required to prepare a Construction SWPPP, but must consider all twelve Elements of Construction Stormwater Pollution Prevention and develop controls for all elements that pertain to the project site.

SWPP Elements are:

- Element 1: Mark Clearing Limits*
- Element 2: Establish Construction Access*
- Element 3: Control Flow Rates*
- Element 4: Install Sediment Controls*
- Element 5: Stabilize Soils*
- Element 6: Protect Slopes*
- Element 7: Protect Drain Inlets*
- Element 8: Stabilize Channels and Outlets*
- Element 9: Control Pollutants*
- Element 10: Control De-Watering*
- Element 11: Maintain BMPs*
- Element 12: Manage the Project*

These Elements are described in detail in Volume 2.

3.4.2.1 Objective

To control erosion and prevent sediment and other pollutants from leaving the site during the construction phase of a project

3.4.3 Minimum Requirement #3: Source Control of Pollution

All known, available and reasonable source control BMPs shall be applied to all projects. Source control BMPs shall be selected, designed, and maintained according to this manual. Structural source control BMPs shall be identified in the stormwater site plan and shall be shown on construction plans submitted for City review.

Source Control BMPs include Operational BMPs and Structural Source Control BMPs. See Volume 4 for design details of these BMPs. For construction sites, see Volume 2, Chapter 3.

3.4.3.1 Objective

The intent of source control BMPs is to prevent stormwater from coming in contact with pollutants. They are a cost-effective means of reducing pollutants in stormwater, and, therefore, should be a first consideration in all projects.

3.4.4 Minimum Requirement #4: Preservation of Natural Drainage Systems and Outfalls

Natural drainage patterns shall be maintained, and discharges from the project site shall occur at the natural location, to the maximum extent practicable. The manner by which runoff is discharged from the project site must not cause a significant adverse impact to downstream receiving waters and downgradient properties. All outfalls require energy dissipation.

As part of a submittal, the applicant shall identify the location of natural drainage, topography, historic drainage information and any potential impacts.

3.4.4.1 Objective

To preserve and utilize natural drainage systems to the fullest extent practicable because of the multiple stormwater benefits these systems provide; and to prevent erosion at and downstream of the discharge location.

3.4.4.2 Supplemental Guidelines

Where stormwater must be discharged offsite, an applicant may discharge surface flow onto neighboring properties if the surface flow has not been concentrated or increased as a result of the project development. An applicant may be allowed to discharge concentrated or increased flows beyond the guidelines in this section only if the applicant has obtained the legal rights to discharge onto neighboring properties.

The following are guidelines to use when discharging increased or concentrated flows onto downgradient properties. Environmental Services shall determine which of the following discharge scenarios will be allowed.

- a. Conveyance to the City system at the direction of or with written approval from Environmental Services. If necessary, the City may require the City storm system to be extended to serve the project site.
- b. If the 100-year peak discharge, as determined by an approved continuous simulation model, is less than or equal to 0.2 cfs under existing conditions and will remain less than or equal to 0.2 cfs under developed conditions, then the concentrated runoff may be discharged onto a rock pad or to any other system that serves to disperse flows.
- c. If the 100-year peak discharge, as determined by an approved continuous simulation model, is less than or equal to 0.5 cfs under existing conditions and will remain less than or equal to 0.5 cfs under developed conditions, then the concentrated runoff may be discharged through a dispersal trench or other dispersal system, provided the applicant can demonstrate that there is no adverse impact to downhill properties or drainage systems.
- d. If the 100-year peak discharge, as determined by an approved continuous simulation model, is greater than 0.5 cfs for either existing or developed conditions, or if a significant adverse impact to downgradient properties or drainage systems is likely, then a conveyance system must be provided to convey the concentrated runoff across the downstream properties to an acceptable discharge point.

3.4.5 Minimum Requirement #5: Onsite Stormwater Management

Projects shall employ, where feasible and appropriate, Onsite Stormwater Management BMPs to infiltrate, disperse, and retain stormwater runoff onsite to the maximum extent feasible without causing flooding, erosion, water quality or groundwater impacts. All projects required to comply with Minimum Requirement #5 shall employ all of the following BMPs as applicable:

- **Roof Downspout Control BMPs, functionally equivalent to those described in Volume 3, Chapter 2, and**
- **Dispersion, functionally equivalent to those described in Volume 3, Chapter 3.**
- **Soil Quality BMPs, functionally equivalent to those in Volume 3, Chapter 4.**
- **Tree Retention and Transplanting BMPs equivalent to those in Volume 3, Chapter 5,**

Where roof downspout controls are planned, the following three types shall be considered in descending order of preference:

- **Downspout infiltration systems including rain gardens (Volume 3, Section 2.5 and Section 2.6, and Volume 6, Section 2.2.3).**

- Downspout dispersion systems (Volume 3, Section 2.7), only if infiltration is not feasible.
- Collect and convey to City system (Volume 3, Section 2.8) if other alternatives are not feasible.

3.4.5.1 Objective

To use stormwater management practices on individual properties to reduce the amount of disruption to the natural hydrologic characteristics of the site

3.4.6 Minimum Requirement #6: Water Quality Treatment

3.4.6.1 Thresholds

The following require construction of stormwater treatment facilities:

- Projects in which the total of effective pollution-generating impervious surface (PGIS) is 5,000 square feet or more in a threshold discharge area of the project, or
- Projects in which the total of pollution-generating pervious surfaces (PGPS) is three-quarters (3/4) of an acre or more in a threshold discharge area, and from which there is a surface discharge in a natural or man-made conveyance system from the site.

Total effective pollution-generating impervious surface shall include all new plus replaced PGIS. That portion of any development project in which the above PGIS or PGPS thresholds are not exceeded in a threshold discharge area shall apply Onsite Stormwater Management BMPs, where feasible, in accordance with Minimum Requirement #5.

If a project meets or exceeds the threshold for water quality treatment, all pollution generating surfaces shall be treated.

3.4.6.2 Treatment Facility Selection, Design, and Maintenance

Stormwater treatment facilities shall be:

- Selected in accordance with the process identified in Volume 5, Chapter 1;
- Designed in accordance with the design criteria in Volume 5; and
- Sized for the entire flow that is directed to them. Runoff from non-pollutant generating surfaces that commingles with runoff from pollutant-generating surfaces shall be treated. Non-pollution generating surface runoff may be directed around the treatment facility.
- Maintained in accordance with the maintenance standards in Volume 1, Appendix C that shall be incorporated in the design as part of a facility operation and maintenance manual.

3.4.6.3 Additional Requirements

- Direct discharge of untreated stormwater from pollution-generating surfaces above the thresholds given in Section 3.4.6.1 to groundwater is prohibited.
- The City of Tacoma Public Works Department and Tacoma-Pierce County Health Department developed a guidance document that provides the circumstances and requirements for approval of infiltration facilities for managing pollution-generating stormwater runoff in the South Tacoma Groundwater Protection District. This document, "Implementation of Stormwater Infiltration for Pollution-Generating Surfaces in the South Tacoma Groundwater Protection District" is available at www.cityoftacoma.org/stormwater.

- The above thresholds apply to both a project's onsite and offsite improvements. Once the project is required to meet this Minimum Requirement, all new and replaced pollution generating impervious surfaces are required to provide treatment. No net or average is permitted between non-pollution generating surfaces and pollution generating.

3.4.6.4 Objective

The purpose of runoff treatment is to reduce pollutant loads and concentrations in stormwater runoff using physical, biological, and chemical removal mechanisms so that beneficial uses of receiving waters are maintained and, where applicable, restored. When site conditions are appropriate, infiltration can potentially be the most effective BMP for runoff treatment.

3.4.7 Minimum Requirement #7: Flow Control

3.4.7.1 Applicability

Projects must provide flow control to reduce the impacts of stormwater runoff from impervious surfaces and land cover conversions. For watershed-specific flow control requirements refer to Chapter 2.

Portions of projects discharging to a wetland shall also be subject to Minimum Requirement #8.

The flow control requirement thresholds apply to projects that discharge directly or indirectly:

- Through a conveyance system into fresh water; or
- Through a conveyance system into a gulch; or
- To a City identified capacity problem existing downstream of the development; or
- To a manmade conveyance system (ditch, swale, etc.) which has not been adequately stabilized to prevent erosion; or
- To a conveyance system without capacity to convey the fully developed design event as defined in Volume 3, Chapter 9.

3.4.7.2 Thresholds

Projects that meet or exceed the following thresholds and discharge as described in Section 3.4.7.1 above require construction of flow control facilities and/or onsite management BMPs.

- Project sites in which the total of effective impervious surfaces is 10,000 square feet or more in a threshold discharge area, or
- Projects that convert $\frac{3}{4}$ acres or more of native vegetation to lawn or landscape, or convert 2.5 acres or more of native vegetation to pasture in a threshold discharge area, and from which there is a surface discharge in natural or man-made conveyance system from the site, or
- Projects that, through a combination of effective impervious surfaces and converted pervious surfaces, cause a 0.1 cfs increase in the 100-year flow frequency from a threshold discharge area as estimated using the Western Washington Hydrology Model or other approved model. Comparison will be between existing and proposed site conditions.

That portion of any development project in which the thresholds listed above are not exceeded in a threshold discharge area, shall apply Onsite Stormwater Management BMPs in accordance with Minimum Requirement #5. Refer to Figure 1 - 5 and Figure 1 - 6 to aid in determining project requirements.

3.4.7.3 Standard Requirement

The standard requirement applies to projects that meet the thresholds as described in Section 3.4.7.2 and discharge directly or indirectly:

- Through a conveyance system into fresh water; or
- Through a conveyance system into a gulch; or
- As required by Environmental Services.

Using WWHM for design, stormwater discharges shall match developed discharge durations to predeveloped durations for the range of predeveloped discharge rates from 50% of the 2-year peak flow up to the full 50-year peak flow. The predeveloped condition to be matched shall be a forested land cover.

Flow control facilities shall be sized for the entire flow that is directed to them. Flow control facilities that accept offsite inflow shall be sized for fully-developed conditions per Volume 3, Section 9.1.1. Offsite inflow may be bypassed around the flow control facility. Bypassed stormwater discharges shall not cause damage to downstream systems or properties and shall meet the requirements of Section 3.4.4.2.

This standard requirement is waived for sites that will reliably infiltrate all the runoff from impervious surfaces and converted pervious surfaces.

3.4.7.4 Infrastructure Protection Requirement

The infrastructure protection requirement is intended to mitigate stormwater impacts from projects that meet the thresholds described in Section 3.4.7.2 and are not required to provide flow control per the standard requirement discussed in Section 3.4.7.3, but discharge directly or indirectly:

- To a City identified capacity problem existing downstream of the development; or
- To a manmade conveyance system (ditch, swale, etc.) which has not been adequately stabilized to prevent erosion; or
- To a conveyance system without capacity to convey the fully-developed design event as defined in Volume 3, Chapter 9.

The applicant may resolve the downstream capacity problem or provide onsite infiltration or detention. Where infiltration or detention is provided, stormwater discharges for the developed condition shall not exceed the discharges under existing conditions.

Stormwater systems shall be sized according to the specific sizing requirements of each BMP (see Volume 3 or Volume 5) though the predeveloped condition to be matched shall be the existing land cover.

The engineer shall conduct a quantitative downstream analysis per Minimum Requirement #11 to verify that onsite detention or infiltration would be required. If onsite detention or infiltration is proposed instead of upsizing the downstream system, the owner must provide a signed letter stating that they understand the proposal and accept the operation and maintenance of the onsite system.

3.4.7.5 Flow Control Exempt Water Bodies

If the following requirements are met, flow control is not required for projects that discharge directly or indirectly to the Puyallup River. If all the following requirements are not met, flow control per the Standard Requirement in Section 3.4.7.3 is required.

- Direct discharge to the exempt receiving water does not result in the diversion of drainage from any perennial stream classified as Types 1,2,3, or 4 in the State of Washington Interim Water Typing System, or from any category I, II, or III wetland; and
- Flow splitting devices or drainage BMPs are applied to route natural runoff volumes from the project site to any downstream Type 5 stream or category IV wetland:
 - Design of flow splitting devices or drainage BMPs will be based on continuous hydrologic modeling analysis. The design will assure that flows delivered to Type 5 stream reaches will approximate, but in no case exceed, durations ranging from 50% of the 2-year to the 50-year peak flow.
 - Flow splitting devices or drainage BMPs that deliver flow to Category IV wetlands will also be designed using continuous hydrologic modeling to preserve existing wetland hydrologic conditions unless specifically waived by the City of Tacoma; and
- The project site must discharge through a conveyance system that is comprised entirely of manmade conveyance elements (e.g., pipes, ditches, outfall protection, etc.) and extends to the ordinary high water line of the exempt receiving water; and
- The conveyance system between the project site and the exempt receiving water shall have sufficient hydraulic capacity to convey discharges from future build-out conditions of the site (see Volume 3, Chapter 9), and the existing conditions from non-project areas from which runoff is or will be collected. Minimum Requirement #11 applies from the project to 1/4 mile downstream from the site. Minimum Requirement #11 requires that the conveyance system within 1/4 mile of the site have sufficient capacity to convey discharges from future build-out conditions of the site and future build-out conditions from the non-project areas from which runoff is, or will be collected. This section requires an analysis of the entire conveyance system between the project site and the flow control exempt water body. This area may extend beyond 1/4 mile downstream from the site; and
- Any erodible elements of the manmade conveyance system must be adequately stabilized to prevent erosion under the conditions noted above.

3.4.7.6 Objective

The purpose of flow control is to prevent increases in natural (prior to the European settlement) stream channel erosion rates. The standard intends to maintain the total amount of time that a receiving stream exceeds an erosion-causing threshold based upon historic rainfall and natural land cover conditions. That threshold is assumed to be 50% of the 2-year peak flow. Maintaining the naturally occurring erosion rates within streams is vital, though by itself insufficient, to protect fish habitat and production.

3.4.7.7 Modeling Requirements

To meet the Standard Requirement in Section 3.4.7.3 or the Infrastructure Protection Requirement in 3.4.7.4, the applicant shall use the Western Washington Hydrology Model or an equivalent Washington State Department of Ecology and City of Tacoma approved

continuous simulation model to size the flow control facilities. The applicant must use a single-event model to model conveyance systems if upsizing infrastructure to meet the Infrastructure Protection Requirement.

There are several acceptable computer models available, however, the designer shall use the most recent version of any proposed software that has been updated with any substantive changes. The designer shall provide a copy of the completed hydrology analysis worksheet (Appendix C) and a copy of the electronic project file.

NOTE: Hand-calculated hydrographs and flow routing will no longer be accepted because of the wide availability of various software programs.

3.4.8 Minimum Requirement #8: Wetlands Protection

Wetlands are regulated by the City of Tacoma through this requirement and the Critical Areas Preservation Ordinance, Tacoma Municipal Code 13.11. For more information about wetlands, wetland permits and development close to wetlands, please contact the Land Use Services Desk at (253) 591-5577.

3.4.8.1 Applicability

Stormwater discharges to wetlands may require a wetland permit as detailed under the City's Critical Areas Preservation Ordinance (TMC 13.11).

The requirements below are in addition to requirements given in TMC 13.11 and apply only to projects whose stormwater discharges into a wetland, either directly or indirectly through a conveyance system. These requirements must be met in addition to meeting Minimum Requirement #6, Water Quality Treatment, when the threshold for treatment is met. All pollution generating surfaces subject to the thresholds and discharging to wetlands shall require water quality treatment prior to discharge to the wetlands.

Streams may also be regulated under this requirement as part of the wetland permit.

3.4.8.2 Thresholds

When either of the thresholds identified in Minimum Requirement #6 – Runoff Treatment, or Minimum Requirement #7 – Flow Control are met or exceeded, this requirement shall also be applied.

3.4.8.3 Standard Requirement

Discharges to wetlands shall maintain the hydrologic conditions, hydrophytic vegetation, and substrate characteristics necessary to support existing and designated uses. The hydrologic analysis shall use the existing land cover condition to determine the existing hydrologic conditions unless directed otherwise by a regulatory agency with jurisdiction. A wetland can be considered for hydrologic modification and/or stormwater treatment in accordance with Guidesheet 1B in Appendix E. Modeling shall be completed with a continuous simulation model. Model calibration and pre- and post-development monitoring of wetland levels, groundwater levels, and water quality may be required by Environmental Services.

3.4.8.4 Additional Requirements

The standard requirement does not override the obligation to apply whatever technology is necessary to comply with state water quality standards, Chapter 173-201A WAC, or state groundwater standards, Chapter 173-200 WAC. Additional treatment requirements to meet those standards may be required by federal, state, or local governments.

Stormwater treatment and flow control facilities shall not be constructed within a natural vegetated buffer, except for:

- **Necessary conveyance systems as approved by the City; or**
- **As allowed in wetlands approved for hydrologic modification and/or treatment in accordance with Guidesheet 1B in Appendix E of this Volume.**

Natural runoff volumes from the project site shall be maintained to any downstream stream or wetland.

Design of flow splitting devices or drainage BMPs that deliver flows to streams will be based on continuous simulation modeling. The design will assure that flows delivered to stream reaches will approximate, but in no case exceed, durations ranging from 50% of the 2-year to the 50-year peak flow. Specific streams or locations may require an alternative mitigation as directed by Environmental Services.

Flow splitting devices or drainage BMPs that deliver flow to wetlands shall be designed using continuous hydrologic modeling to preserve pre-project wetland hydrologic conditions unless specifically waived or exempted by Environmental Services.

An adopted and implemented basin plan (Minimum Requirement #9), or a Total Maximum Daily Load (TMDL, also known as a Water Clean-up Plan) may be used to develop requirements for wetlands that are tailored to a specific basin. Requirements for specific basins within Tacoma are listed in Chapter 2 of this volume.

3.4.8.5 Objective

Wetlands are extremely important natural resources which provide multiple stormwater benefits, including groundwater recharge, flood control, and stream channel erosion protection. They are easily impacted by development unless careful planning and management are conducted.

Wetlands can be severely degraded by stormwater discharges from urban development due to pollutants in the runoff and also due to disruption of natural hydrologic functioning of the wetland system. Changes in water levels and the frequency and duration of inundations are of particular concern. This requirement ensures wetlands are protected.

3.4.8.6 Supplemental Guidelines

Appendix E contains guidance for wetlands when interacting with stormwater. **Environmental Services may require applicants to utilize portions or all of the guidance in analyzing and mitigating wetland impacts.**

3.4.9 Minimum Requirement #9: Basin/Watershed Planning

Projects may be subject to equivalent or more stringent Minimum Requirements for erosion control, source control, treatment, and operation and maintenance, and alternative requirements for flow control and wetlands hydrologic control as identified in changes to existing and new Basin/Watershed Plans. City and Regional Basin/Watershed plans shall evaluate and include, as necessary, retrofitting urban stormwater BMPs into existing development and/or redevelopment in order to achieve watershed-wide pollutant reduction and flow control goals that are consistent with requirements of the federal Clean Water Act. Standards developed from basin plans shall not modify any of the above Minimum Requirements until the basin plan is formally adopted and implemented by the local governments within the basin, and approved or concurred with by Ecology. Where geographic specific requirements have been identified, they appear in Chapter 2. Future

additional requirements developed as a result of Basin Planning will be added to Chapter 2.

3.4.9.1 Objective

To promote watershed-based planning as a means to develop and implement comprehensive, water quality protection measures. Primary objectives of basin planning are to reduce pollutant loads and hydrologic impacts to surface and groundwaters in order to protect beneficial uses.

3.4.10 Minimum Requirement #10: Operation and Maintenance

An Operation and Maintenance (O&M) Manual that is consistent with the provisions in Chapter 4 of this Volume shall be provided for all proposed stormwater BMPs at the time construction plans are submitted for review. The party (or parties) responsible for maintenance and operation shall be identified.

For private facilities, a copy of the O&M Manual shall be retained onsite or within reasonable access to the site, and shall be transferred with the property to the new owner. For private systems serving multiple lots within residential developments or other developments, a separate covenant or other guarantee of proper maintenance that can be recorded on title shall be provided and recorded. For public facilities, a copy of the manual shall be retained by the appropriate department.

For all facilities (public and private), a log of maintenance activities outlining all inspections and routine or corrective actions completed shall be kept and be available for inspection by the City.

3.4.10.1 Objective

To ensure that stormwater control facilities are adequately maintained and operated properly.

3.4.10.2 Supplemental Guidelines

Inadequate maintenance is a common cause of failure for stormwater control facilities. The description of each BMP in Volumes 2, 3, 5 and 6 includes a section on maintenance. Appendix C of Volume 1 includes a schedule of maintenance standards for drainage facilities.

3.4.11 Minimum Requirement #11: Offsite Analysis and Mitigation

As required by the Minimum Requirements of this Chapter and the Watershed Specific Requirements of Chapter 2, development projects that discharge stormwater offsite shall submit as part of their Stormwater Site Plan and Report an offsite analysis that assesses the potential offsite impacts of stormwater discharge.

3.4.11.1 Qualitative Analysis:

All project applicants shall perform and submit a *qualitative* analysis of each upstream system entering a site (run-on) and each downstream system leaving a site (run-off). The qualitative analysis shall extend downstream for the entire flow path, from the project site to the receiving water, or up to one-quarter mile, whichever is less. The upstream analysis shall identify and describe points where water enters the site and the tributary area. A basin map delineating the onsite and offsite basins tributary to the site shall be provided. The basin map shall be to a defined scale. The City's GovMe website may be used as a base for the basin map, and to obtain contours and existing stormwater facility information. However, field verification may be required.

Upon review of this analysis, the City may require a qualitative analysis further downstream, mitigation measures adequate to address the problems, or a quantitative analysis, depending upon the presence of existing or predicted flooding, erosion, or water quality problems, and on the proposed design of the onsite drainage facilities. Details on how to perform this analysis are located in Volume 1, Chapter 4 and Volume 1, Appendix B.

3.4.11.2 Quantitative Analysis

A *quantitative* analysis will be required for all projects that meet the flow control thresholds as described in Section 3.4.7.2. except those required to provide detention per the Standard Requirement as described in Section 3.4.7.3. The City may also require a quantitative analysis for any project deemed to need additional downstream information. Details on how to perform this analysis are outlined in Volume 3 Section 9.2.

3.4.11.3 Objective

To identify and evaluate offsite water quantity, erosion, slope stability, and drainage impacts that may be caused or aggravated by a proposed project, and to determine measures for preventing impacts and for not aggravating existing impacts. Aggravating shall mean increasing the frequency of occurrence and/or severity of a problem. Some of the most common and potentially destructive impacts of land development are erosion of downgradient properties, localized flooding, and slope failures. These are caused by increased surface water volumes and changed runoff patterns. In addition the applicant will evaluate types and locations of surface run-on to the project site. These must be safely conveyed across the project site.

3.4.12 Minimum Requirement #12: Financial Liability

Performance bonding or other appropriate financial guarantees may be required for certain projects to ensure construction of drainage facilities in compliance with these standards. In addition, a project applicant may be required to post a financial guarantee of the satisfactory performance and maintenance of any drainage facilities.

Where required, the proponent shall submit a bond or other financial surety acceptable to the City to guarantee that the proponent will correct any defect or subsequent problem in a dedicated improvement, including the satisfactory functioning of the project's drainage system caused by improper design, faulty construction, poor housing construction practices, or other reasons as determined by the City. The guarantee shall not exceed 10% of the construction cost of the project as determined by the City through review of the Engineer's submitted cost estimate. The guarantee shall remain in effect for a period of 24 months from the time that the City accepts the storm drainage system for maintenance. The proponent shall remain financially responsible for any and all costs exceeding the amount of the original financial guarantee for the guarantee time period.

The guarantee shall be submitted to the City before the improvements are dedicated to the City or, if applicable, before the posted construction bond is released back to the proponent at the proponent's option.

3.4.12.1 Objective

To ensure that development projects have adequate financial resources to fully implement stormwater management plan requirements and that liability is not unduly incurred by the City.

3.5 Exceptions

3.5.1 Exceptions to the Minimum Requirements

NOTE: Throughout this Section, **guidance to meet the requirements is written in BOLD**. Supplemental guidelines that serve as recommendations and other information are not written in bold.

Exceptions to the Minimum Requirements may be requested, in writing, in accordance with TMC 12.08.095 to allow a waiver of a requirement, a reduction or modification of a requirement, or to permit an alternative requirement. Public notice of application for an exception, draft decision and written findings will be published in accordance with TMC 12.08.095, with an opportunity for public comment. Exceptions must meet the following criteria:

- **Application of the Minimum Requirements would impose a severe and unexpected economic hardship; and**
- **The exception will not increase risk to the public health and welfare, nor be injurious to other properties in the vicinity and/or downstream, and to the quality of waters of the state; and**
- **The exception is the least possible exception that could be granted to comply with the intent of the Minimum Requirements.**

In accordance with TMC 12.08.095, the Public Works Director may grant an exception following a documented finding that:

- **The exception is likely to be equally protective of public health, safety and welfare, the environment, and public and private property, as the requirement from which an exception is sought.**

OR

- **Substantial reasons exist under TMC 12.08.095 C., for approving the requested exception and the exception will not cause significant harm. The substantial reasons may include, but are not limited to:**
 - **The requirement to be imposed is not technically feasible; or**
 - **An emergency situation necessitates approval of the exception; or**
 - **No reasonable use of the property is possible unless the exception is approved; or**
 - **The requirement would cause significant harm or a significant threat of harm to public health, safety and welfare, the environment, or to public and private property, or would cause extreme financial hardship which substantially outweighs its benefits.**

The decision to grant an exception is within the sole discretion of the City, and the Director shall only approve an exception to the extent it is necessary. The Director may impose new or additional requirements to offset or mitigate harm that may be caused by approving the exception. The Director may require the applicant to submit a licensed engineer's report or analysis along with a request, in writing, for an exception.

The approval of an exception shall not be construed to be an approval of any violation of any of the other provisions of the City's Municipal Code, or of any other valid law of any governmental entity having jurisdiction.

Applications for an exception from the Minimum Requirements of TMC 12.08.090 must be in writing and include the following information:

- **The current (pre-project) use of the site, and**
- **How the application of the Minimum Requirement(s) restricts the proposed use of the site compared to the restrictions that existed prior to the adoption of the Minimum Requirements; and**
- **The possible remaining uses of the site if the exception were not granted; and**
- **The uses of the site that would have been allowed prior to the adoption of the Minimum Requirements; and**
- **A comparison of the estimated amount and percentage of value loss as a result of the Minimum Requirements versus the estimated amount and percentage of value loss as a result of requirements that existed prior to adoption of the Minimum Requirements; and**
- **The feasibility for the owner to alter the project to apply the Minimum Requirements.**

3.5.2 Other Exceptions

Exceptions to the requirements in this manual, not including exceptions to the Minimum Requirements, may be requested in writing to Environmental Services. The exception request must describe why the requirement in the manual cannot be met and why it will not likely affect downstream properties, the quality of waters of the state, and the health and welfare of the public. Environmental Services will make the final determination on whether to approve or deny the exception and inform the applicant.