CHAPTER 9
STORM DRAINAGE

9.01 General

The standards established by this chapter are intended to represent the minimum standards for the design and construction of storm drainage facilities.

9.02 Design Standards

The design of storm drainage, retention, and detention systems shall be completed as outlined in the 2019 version of the Department of Ecology Stormwater Management Manual for Western Washington, the Washington State Department of Transportation Hydraulics Manual and this Chapter. All recommendations set forth in the Stormwater Management Manual for Western Washington shall be considered minimum requirements for the design of stormwater facilities in the City of Centralia unless otherwise detailed in this Chapter.

Minimum Requirements for New Development and Redevelopment

This section outlines the nine (9) minimum requirements for stormwater management applicable to new development and redevelopment sites as detailed in the Department of Ecology Stormwater Management Manual for Western Washington (SWMMWW) Volume 1, Chapter 2. The nine (9) 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. On-site Stormwater Management
6. Runoff Treatment
7. Flow Control
8. Wetlands Protection
9. Operation and Maintenance

Depending on the type and size of the proposed project, different combinations of the requirements listed above will apply. The appropriate City of Centralia Stormwater Review Worksheet for your site shall be followed to determine which requirements will need to be met.

Storm Drainage

Stormwater management falls into one of three categories for review:

1. General Stormwater Plan Review – Projects over 5,000 square feet of new and/or replaced impervious surfaces.

2. Single Family and Small Site Stormwater Plan Review – Projects with 2,000 to 4,999 square feet of new and/or replaced surfaces and all single family residential sites.

3. Minor Project construction Stormwater Review – Projects less than 2,000 square feet of new and/or replaced impervious surfaces.

Applicants for development must fill out the appropriate Stormwater Review Worksheet and complete the requirements detailed in the worksheet and in this Chapter as applicable to the project. The completed Stormwater Review Worksheet, stormwater site plan and the Stormwater Plan Review Fee, must be submitted for review and approval.

9-02.1 Minimum Requirement #1: Preparation of Stormwater Site Plans

All projects meeting the thresholds in Volume 1 Section 1-3.1 of the SWMMWW shall prepare a Stormwater Site Plan for review. Stormwater Site Plans shall use site-appropriate development principles to retain native vegetation and minimize impervious surfaces to the extent feasible. Stormwater Site Plans shall be prepared in accordance with Volume 1 Chapter 3.4.1.

9-02.2 Minimum Requirement #2: Construction Stormwater Pollution Prevention (SWPP)

All new development and redevelopment projects with land alteration activities are responsible for preventing erosion and discharge of sediment and other pollutants into receiving waters.

Land alteration activities are those activities which are commonly referred to as clearing (the act of vegetation removal from the land surface); grubbing (the act of root vegetation removal from beneath the surface of the earth); excavation (the mechanical removal of earth material); filling (deposition of earth material placed by artificial means); grading; and stockpiling.

9-02.2-A Single Family and Small Site Stormwater Pollution Prevention

A small site project is defined as a one-lot single-family home or other construction project that adds or replaces less than 2,000 square feet of impervious surface or clears less than 7,000 square feet of land.

The applicant developing a small site shall submit a City of Centralia Single Family and Small Site Stormwater Review Worksheet and a site improvement and drainage plan on 8½″ x 11″ or 11″ x 17″ paper showing the following:

- Name, address, and phone number of owner or contact person;
- North arrow, lot number and plat, address, date, and street name fronting structure;
- Footprint of all proposed structures and any existing structures on the site;
- Location of any environmentally sensitive areas on or immediately adjacent to the site, including streams, wetlands, steep slopes, and their required buffers;
- Arrows or topographical contours showing the slope of the site;
- Methods to convey runoff away from the proposed structures or construction activity;
- Proposed location and erosion protection of excavated soil stockpiles (if applicable);
- BMPs used to stabilize disturbed areas of the site and to protect adjacent properties and/or streets from sediment (these methods may include plastic covering, mulching, seeding, planting, sodding, vegetative buffer strips, sediment barriers or filter fences, and dikes);
- A construction vehicle access;
- A note calling for periodic street cleaning to remove any sediment tracked off the site;
- A note calling for routine inspection and maintenance of all installed erosion and sediment control BMPs, especially after storms;
- A note calling for appropriate measures to be taken to stop sediments from entering waterways if the proposed BMPs fail.

9.02.2B Large Parcel Stormwater Pollution Prevention Plans (SWPPP)

An applicant proposing a development that is not a single family residence, adds or replaces 2,000 square feet or more of impervious surface or clears more than 7,000 square feet must submit a City of Centralia General Stormwater Review worksheet with all required attachments as detailed on the worksheet.

The SWPPP submitted must have a narrative as well as drawings and details. The Construction SWPPP must be a stand alone document and must be located on the construction site at all times.

As site work progresses, the plan must be modified to reflect changing site conditions. The owner of lessee of the land being developed has the responsibility for Construction SWPPP preparation and submission to the City of Centralia for review and approval prior to construction. The owner or lessee may designate someone (i.e., an engineer architect, contractor, etc.) to prepare the Construction SWPPP, but he/she retains ultimate responsibility.

The Construction SWPPP narrative must contain concise information about existing site conditions, construction schedules, maintenance plan and other pertinent items that are not contained on the drawings. The narrative shall address the thirteen (13) elements as detailed in the SWMMWW Volume 2 Section 3.2. The narrative shall be site-specific and list specific BMPs that will be used to address each element.

The drawings and notes describe where and when the various BMPs will be installed, the performance that the BMPs are expected to achieve, and actions to be taken if the performance goals are not achieved. Specific details for each BMP that will be used as part of the project shall be included on the drawings.

Sites with a disturbed area equal to or greater than 1 acre must also apply for a Construction General Stormwater Permit from the Department of Ecology. This permit must be active before construction approval will be given by the City.

9-02.3 Minimum Requirement #3: Source Control of Pollution

All known, available and reasonable source control BMPs must be applied to all projects. Source control BMPs must be selected, designed and maintained in accordance with the SWMMWW. Source Control BMPs include Operational BMPs and Structural Source Control BMPs. See SWMMWW Volume IV for design details of these BMPs.

9-02.4 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 possible. The manner by which runoff is discharged from the project site must not cause an adverse impact to the downstream receiving waters and downgradient properties. All outfalls require energy dissipation. See SWMMWW Volume 1 Section 1-3.4.4 for requirements.

9-02.5 Minimum Requirement #5: On-site Stormwater Management

All projects that require Minimum Requirement #5 shall employ On-site Stormwater Management BMPs in accordance with the following project thresholds, standards, and lists to infiltrate, disperse, and retain stormwater runoff on-site to the extent feasible without causing flooding or erosion impacts. The objective of on-site stormwater management is to use practices distributed across a development that reduce the amount of disruption of the natural hydrologic characteristics of the site.

Projects qualifying as flow control exempt in accordance with the TDA Exemption in 1-3.4.7 MR7: Flow Control shall either:

Use the LID BMPs from List #3 for all surfaces within each type of surface listed in List #3
Or
Use any Flow Control BMPs desired to achieve the LID Performance Standard and apply BMP T5.13: Post-Construction Soil Quality and Depth.

PROJECT THRESHOLDS

Projects triggering only Minimum Requirements #1 through #5 shall either:

a. Use On-site Stormwater Management BMPs from List #1 for all surfaces within each type of surface in List #1; or

b. Use any Flow Control BMP(s) desired to achieve LID Performance Standard and apply BMP T5.13: Post-Construction Soil Quality and Depth.

Projects triggering Minimum Requirements #1 through #9 must meet the requirements in Table 1-3.1 below:

Table 1-3.1 On-site Stormwater Management Requirements for Projects Triggering Minimum Requirements #1 through #9

Project Type and Location	Requirement
Projects on any size parcel inside the City Limits or UGA	Low Impact Development (LID) Performance Standard and BMP T5.13; or List #2 (applicant option)
New development outside the UGA on a parcel smaller than 5 acres	Low Impact Development Performance Standard and BMP T5.13 or List #2 (applicant option).
Projects outside the UGA, on a parcel of 5 acres or larger	Use any Flow Control BMPs desired to achieve LID Performance Standard, and apply BMP T5.13

Low Impact Development (LID) Performance Standard

The LID Performance Standard compliance method for MR #5 requires modeling the proposed flow control bmps to demonstrate the flow reduction as described below. Note that in order to meet the LID Performance Standard, the chosen Flow Control BMPs will most likely need to include infiltration.

Stormwater discharges shall match developed discharge durations to pre-developed durations for the range of pre-developed discharge rates from 8% of the 2-year peak flow to 50% of the 2-year peak flow. Refer to the Standard Flow Control Requirement section in Minimum Requirement #7 for information about the assignment of the pre-developed condition. Project sites that must also meet minimum requirement #7 – Flow Control – must match flow durations between 8% of the 2-year flow through the full 50-year flow.

The List Approach

Evaluate the BMPs in SWMMWW Table 1-3.2: The List Approach to MR5 Compliance. For each surface, consider the BMPs in the order listed for that type of surface. Use the first BMP that is considered feasible. No other On-site Stormwater Management BMP is necessary for that surface. Feasibility shall be determined by evaluation against:

1. Design criteria, limitations, and infeasibility criteria identified for each BMP in the SWMMWW; and
2. Competing Needs Criteria analysis in accordance with the SWMMWW.

List #1 in Table 1-3.2 is for projects triggering MR #1 - #5 that are not flow control exempt. List #2 is for projects triggering MR#1 - #9 that are not flow control exempt and List #3 is for Flow Control Exempt projects only. For assistance utilizing the lists to meet MR #5 please contact the City of Centralia Engineering Department.

9-02.5 Minimum Requirement #6: Runoff Treatment

The following require construction of stormwater treatment facilities:

- Projects in which the total of pollution-generating hard surfaces (PGHS) 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) (not including permeable pavements) is three quarters of an acre or more in a threshold discharge area, and from which there will be a surface discharge in a natural or man-made conveyance system from the site.
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See Section III-2.6 in Volume 3 of the SWMMWW for treatment facility BMP sizing criteria and Section III-1.2 for assistance in selection, design and maintenance requirements of the treatment BMPs.

For all sites 1 acre in size or larger within the Critical Aquifer Recharge Area that are zoned Industrial, Commercial, Limited Business District, Multifamily or Port Master Plan, basic or enhanced treatment BMPs are required for pre-treatment of stormwater from PGHS prior to utilizing runoff treatment facilities that include infiltration into the native soil or engineered soil for treatment.

9-02.7 Minimum Requirement #7: Flow Control

Projects must provide flow control to reduce the impacts of stormwater runoff from hard surfaces and land cover conversions. The requirements in Section 2.5.7 of Volume I applies to projects that discharge stormwater directly, or indirectly through a conveyance system into a fresh waterbody.

The following circumstances require achievement of the standard flow control requirements for western Washington:

- Projects in which the total effective impervious surfaces is 10,000 square feet or more in a threshold discharge area, or

- Projects that convert ¾ acres or more of 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 a natural or man-made conveyance system from the site, or
- Projects that through a combination of effective hard surfaces and converted vegetation areas causes a 0.10 cubic feet per second increase in the 100-year flow frequency from a threshold discharge area as estimated using the Western Washington Hydrology Model or other approved model and one-hour time steps (or a 0.15 cfs increase using 15-minute time steps).

If a discharge is to a stream that leads to a wetland, or to a wetland that has an outfall to a stream, both this requirement and Minimum Requirement #8 apply.

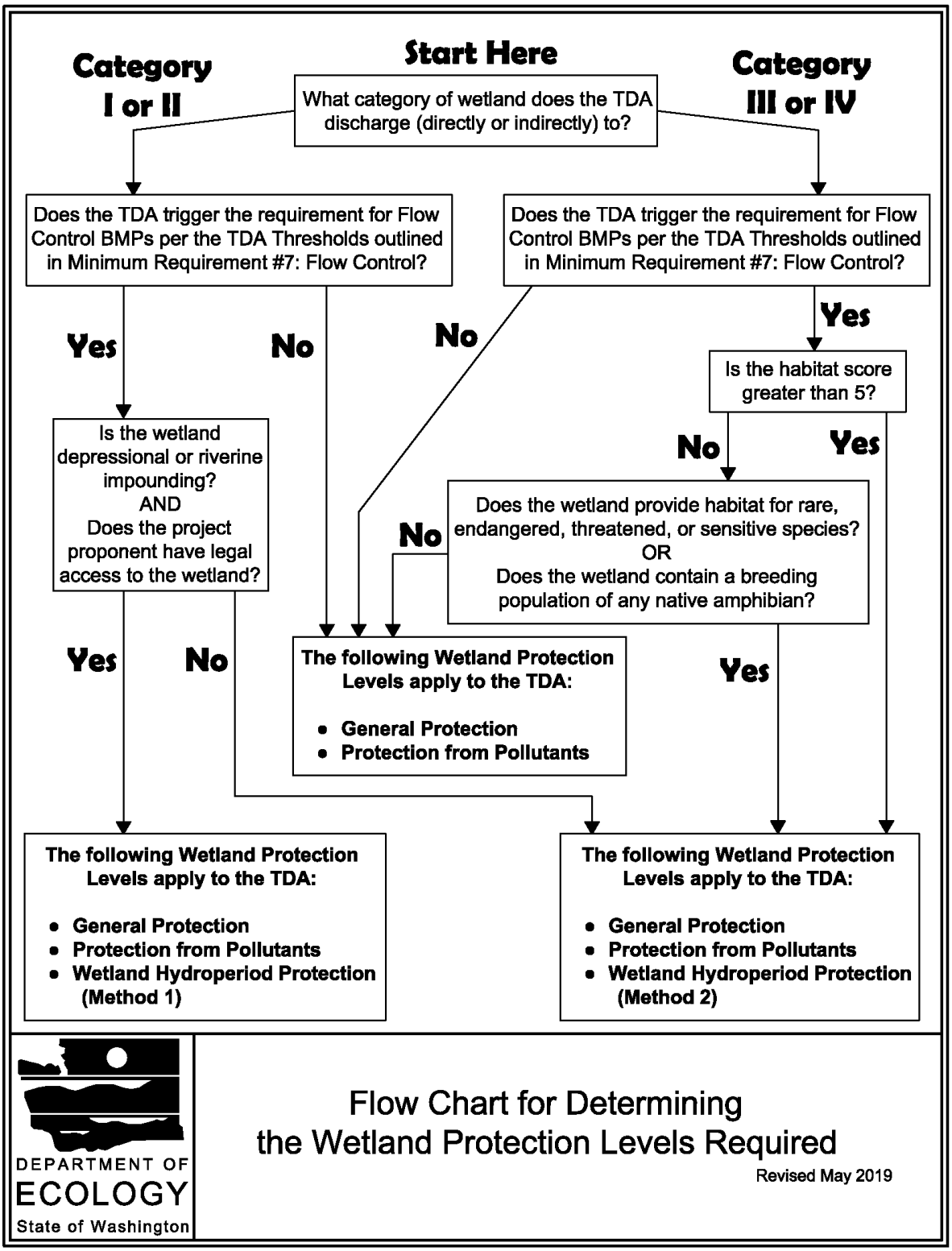
9-02.8 Minimum Requirement #8: Wetlands Protection

The requirements of Minimum Requirement #8 apply only to projects whose stormwater discharges into a wetland, either directly or indirectly through a conveyance system. Each project that requires adherence to MR#8 must be reviewed to determine what level(s) of wetland protection must be applied to comply with this minimum requirement. The levels of wetland protection that must be applied are dependent upon:

- The category of wetland that the project is discharging to,
- Whether or not the project triggers the requirement for Flow Control BMPs per MR#7,
- Whether or not the wetland is a depressional or impounded wetland,
- Whether or not the project proponent has legal access to the wetland,
- The wetland habitat score,
- Whether or not the wetland provides habitat for rare, endangered, threatened, and/or sensitive species, and
- Presence of a breeding population of native amphibians.

Refer to Figure I-3.5: Flow Chart for Determining Wetland Protection Level Requirements in the SWMMWW to determine what level(s) of wetland protection must be applied to comply with Minimum Requirement #8.

Figure I-3.5: Flow Chart for Determining Wetland Protection Level Requirements



9-02.9 Minimum Requirement #9: Operation and Maintenance

An operation and maintenance manual that is site specific and consistent with the provisions in Volume V shall be provided for proposed stormwater facilities and BMPs. The party responsible for maintenance and operation shall be identified in the manual. A copy of the operation and maintenance manual shall be retained on-site or within reasonable access to the site and shall be transferred with the property to the new owner.

A stormwater maintenance agreement must be signed by the property owner prior to construction approval. Once construction has been complete, the final document must be recorded at the Lewis County Auditor's Office before occupancy will be given. The agreement template may be obtained by contacting the Engineering Department.

Inspection reports shall be maintained on-site with the operation and maintenance manual and be provided for review by the City when requested.

9-03 Vehicle and Equipment Washwater Discharge

All businesses that regularly wash vehicles and/or equipment surfaces shall conform to the requirements of the Best Management Practices Manual for Vehicle and Equipment Washwater Discharges and the 2019 Stormwater Management Manual for Western Washington prepared by the Washington State Department of Ecology. These requirements will also apply to farm/construction vehicles, equipment rinsing, mobile washers, new/used car dealerships, and charity car washes.

9-03.1 Businesses that are specifically a ″Car Wash″, shall be designed for zero (0) discharge to the public sanitary sewer system. These businesses shall be required to install a flow meter on the discharge line connecting to the City's sanitary sewer system.

9.04 Department of Ecology Stormwater Permits

All projects that have land disturbing activities totaling one-acre or more are required to apply for a Department of Ecology Construction General Stormwater Permit. Total land disturbing activities must include the cumulative acreage of the entire project whether in a single or in a multiphase project. This applies even if you are responsible for only a small portion (less than one-acre) of the larger project planned over time.

The Construction General Stormwater Permit Application must be filled out and submitted to the Department of Ecology along with any required permit fees. The application can be

obtained by contacting the Department of Ecology. The application is also available on their website at: www.ecy.wa.gov/programs/wq/stormwater/construction

Proof of this permit must be submitted to the City of Centralia Engineering Department before construction plans will be approved.

Exceptions to this requirement are only allowed with written approval submitted to the City from the Department of Ecology.

9.05 Conveyance

Storm drain pipe within a public right-of-way or easement shall be sized to carry the maximum anticipated runoff from the possible contributing area.

The minimum main size shall be 12 inches in diameter. Lateral lines may be 8 inches in diameter. Minimum culvert size shall be 12 inches in diameter. Nothing shall preclude the City from requiring the installation of larger sized main if the City determines a larger size is needed to serve adjacent areas or for future service.

9.06 Pipe Types

Pipe material, joints, and protective treatment shall conform to the requirements set forth in Section 9-05 of the WSDOT/APWA Standards Specifications and this Chapter. The following pipe materials are allowed for use in pipe systems in the City of Centralia:

Reinforced concrete pipe;

Ductile iron pipe;

PVC pipe (SDR35, ASTM D3034 with 3 feet of cover outside pavement areas and 2 feet of cover under pavement areas, minimum);

Corrugated high density polyethylene pipe, (HDPE) dual wall with smooth interior with 3 feet of cover outside pavement areas and 2 feet of cover under pavement areas, minimum).

Materials for concrete, rubber gaskets, metal castings, reinforcing steel, and masonry units shall meet the requirements of appropriate sections of the WSDOT/APWA Standard Specifications.

The City encourages the use of open vegetated channels to convey stormwater runoff where possible. Any open channels proposed within public right-of-way shall require approval from the City Engineer and be constructed to the standards of a biofiltration swale.

9.07 Catch Basins

Maximum catch basin spacing will be 300 feet on arterials and collectors and 500 feet on all other street classifications. No surface water will cross any roadway to private property without the approval of the City Engineer. Catch basins shall conform to Standard Plans 9-01, 9-02 and 9-03.

Catch basins that discharge to an existing system that does not have stormwater treatment shall have a 90 degree elbow installed in the outlet end.

9.08 Staking

All surveying and staking shall be performed by the design engineer or a licensed surveyor capable of performing such work. The engineer or surveyor directing such work shall be licensed by the State of Washington. Staking shall be maintained during construction.

A pre-construction meeting shall be held with the City prior to commencing staking. All construction staking shall be inspected by the City prior to construction.

The minimum staking of storm sewer systems shall be as follows:

Stake centerline alignment every 25 feet with cuts and/or fills to bottom of trench.

Stake location of all catch basins, manholes, and other fixtures for grade and alignment.

Stake location, size and depth of retention or detention facility.

Stake finished grade of each catch basin/manhole rim elevation and invert elevations of all pipes in catch basins, manholes, and those that daylight.

9.09 Trench Excavation

See Guidelines Section 2.16 for requirements regarding trench excavation.

9.10 Backfilling

See Guidelines Section 2.18 for requirements regarding backfilling.

9.11 Street Patching and Restoration

See Guidelines Section 4.16, 4.17, and 4.18 for requirements regarding street patching and restoration.

9.12 Required Notes for Storm Drainage Plans

The Storm Drainage Installation General Notes must be shown on the plans.

LIST OF DRAWINGS

CHAPTER 9: STORM DRAINAGE