CHAPTER 4 - STORM DRAINAGE

3.00 General Approval Requirements

A. See Chapter 1 for general construction requirements, including the requirements for extension of all drainage conveyance pipes to limits of property, surety bond, ~~utility review,~~ and other general requirements.

B. These requirements shall apply to all storm drainage facilities in existing and proposed public right-of-way, public drainage easements, and tracts of common ownership in the City. Storm drainage systems include, but are not limited to: inlets, pipes, ditches, creeks, rivers, wetlands, and stormwater quality and quantity facilities. Storm facilities located on, and serving private property are required to follow the requirements of this section for the design and sizing of water quality treatment and detention facilities.

3.01 Planning Criteria

A. The City of Stevenson has established these requirements for the design of facilities intended to protect the public health, safety, and welfare from damage due to flooding. Beyond that level of protection, additional measures are specified in this chapter which are intended to minimize any potential flooding damage and allow for efficient operation, repair, and maintenance of the storm drainage system.

B. In residential and commercial development, storm sewer main extensions are required to assure orderly and adequate extension of the storm sewer system. These extensions are to be in accordance with requirements of development and service availability as established by the City and the Washington State Department of Ecology.

C. For development proposals that may contribute to areas of known flooding as determined by the City Engineer, the initial land use application submittal for development proposals may be required to include an off-site analysis report beyond what may be required by the referenced Washington State Department of Ecology Manuals. The off-site analysis is to contain an assessment of potential off-site drainage impacts associated with the development proposal and proposed mitigations to those impacts.

D. Design and construction of drainage facilities, including but not limited to open channels, conveyance pipe, and inlets shall be in compliance with these Standards, the Standard Details and the 2019 edition of "Stormwater Management Manual for Western Washington" (hereinafter referred to as the Western Washington Manual) prepared by the Washington State Department of Ecology, as amended herein.

E. Storm drainage pipes shall be extended through and to the extremes of the property being developed along the natural drainage ways, to provide connection points for future development of unserved property as determined by the City Engineer.

F. No private storm sewer shall be located within any lot other than the lot which is the site of the building or structure served by such sewer. The exception to this may be common areas in planned unit developments, and/or City right of-ways, or as otherwise approved by the City Engineer.

G. Provisions must be made for gravity drainage of roofs and foundation drains for all new buildings and structures. For multi-family, residential, commercial, or industrial developments, these drains shall be piped directly to on-site stormwater systems. In single family residential developments, these drains shall be discharged to on-site drywells and shall not be permitted to discharge to the street gutter or directly to the public storm drain system. Deviation from these standards may be subject to a geotechnical review in landslide prone areas.

H. Provisions must be made for stormwater from private property to remain on private property or be collected and directed to a public or private stormwater system or natural drainage way. Runoff from that portion of driveways behind the back of sidewalk (outside the right-of-way) may be permitted to drain directly to the street, provided that treatment and detention facilities are sized to handle this flow.

I. Stormwater systems on private property shall be designed and constructed to the most recent edition of the Uniform Plumbing Code.

J. Private stormwater systems that connect to a public conveyance system routed to a local public stormwater facility may be required to be designed and constructed to public standards as required by the City Engineer.

Commented [TS1]: Maintenance requirements for private stormwater systems are addressed in Section 3.12C.

3.02 Exemptions

A. The following types of projects are exempt from this section:

1) Forest practices regulated under Title 222 Washington Administrative Code, except for Class IV General forest practices that are conversions from timber land to other uses.

2) Commercial agriculture practices involving working the land for production.

3) Road maintenance practices as follows: 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, and vegetation maintenance.

3.03 General Design Requirements

A. The City of Stevenson has adopted the 2019 Western Washington Manual as amended herein.

B. The City encourages the use of "Sustainable Street" concepts and also Low Impact Development (LID) concepts and techniques. Low-Impact Development (LID) techniques shall generally be designed in conformance with the 2019 Western Washington Manual.

C. These standards shall also apply to both public and privately owned and maintained systems.

3.04 Water Quantity and Quality Standards

A. The minimum standards for the design and construction of stormwater facilities in the City of Stevenson shall be the same as the Western Washington Manual except as amended herein.

B. "Effective impervious surface" shall be defined as those impervious surfaces that are connected via sheet flow or discrete conveyance to a drainage system. Impervious surfaces on residential development sites are considered ineffective if the runoff is dispersed through at least one hundred feet of native vegetation. For small residential infill development sites of 8 lots or less, and at the discretion of the City Engineer, the existing impervious areas may be deducted from the total proposed (developed) effective impervious area for the threshold calculation of the "new effective impervious area".

C. The provisions of this section apply to all new development or redevelopment that:

1) Results in 5,000 square feet or more of new effective impervious surface, has more than 7,000 square feet of land disturbing activities, converts ¾ acres or more from native vegetation to lawn or landscaped areas, or converts 2.5 acres or more native vegetation to pasture;

2) Results in the addition or replacement of more than 1,000 square feet of effective

impervious surface for any of the development or redevelopment activities requiring oil/water separators per Section 3.11;

3) Redevelopment that results in 10,000 square feet or more of replaced effective impervious surface is subject to the provisions of this section for the portion of the site that is redeveloped.

D. Projects may utilize the Santa Barbara Unit Hydrograph (SBUH) method for hydrologic and hydraulic analysis and facility sizing. A Soil Conservation Society (SCS) Type 1A rainfall distribution resolved to a maximum of 10-minute time intervals shall be used. Otherwise, facilities shall be sized with an approved Continuous Stormwater Modeling software (Western Washington Hydraulic Model of MGSflood).

1) Isopluvial maps used for analysis shall be "Isopluvial Maps for Design Storms in Skamania County," as published in National Oceanic and Atmospheric Administration (NOAA) Atlas 2, "Precipitation - Frequency Atlas for the Western United States," Volume IX, Washington.

2) Curve numbers used for analysis shall be as specified in "USDA SCS TR-55", June 1986 published by the SCS.

3) All facilities shall provide emergency overflow routes for storm events that exceed the design capacity of the facility.

E. If a site is proposed to be constructed in phases, the first phase shall have a stormwater facility designed to accommodate the ultimate development of the site. The stormwater facility may be constructed in phases provided a plan for phasing is submitted and approved by the City Engineer.

F. Infiltration is the preferred BMP if site conditions are appropriate and groundwater quality will not be impaired. All applicable discharges to groundwater shall comply with the requirements of the Washington State Department of Ecology Underground Injection Control Program.

1) Infiltration systems shall be designed and sized in accordance with Chapter 3.3 of Volume III of the Western Washington Manual.

2) Infiltration facilities shall be designed to infiltrate the 100-year design storm. Facilities that infiltrate less than the 100-year design storm shall meet the quantity standards of this section.

G. Soil groups used for analysis shall be as defined in the most current version of "Hydrologic Soil Groups for Soils in Skamania County," published by the SCS. Alternatively, hydrological soil groups from the United States Department of Agriculture (USDA) "Web Soil Survey" can be used, or soil groups can be established by a Registered Soil Scientist.

3.05 Design of Conveyance Facilities

A. Storm drain conveyance systems shall be sized to convey the 25-year storm event, and to pass the 100-year storm event through the site with zero property damage. Where a natural drainage way is designated to remain in open-space as shown on the City's Comprehensive Plan, and that drainage way is not part of the regional conveyance facility, stormwater shall be conveyed through that drainage way by closed conduit sized for the 10-year storm event.

B. Closed conveyance system elements shall be designed to operate in an open flow, not pressure flow regime, for the design storm.

C. Runoff from the 100-year storm may leave pipes and channels but shall not rise to elevations

more than 2 feet below that of the lowest finished floor of buildings.

D. For roadway flooding conditions during the 100-year storm, one travel lane in either direction shall remain open to emergency vehicles at all times. A travel lane will be considered to be open to emergency vehicles if the maximum depth of flow in the travel lane does not exceed 0.5 feet.

E. For parking lot flooding conditions during the 100-year storm, the maximum depth of ponding shall not exceed 1-foot. Storage volumes resulting from ponding in street and parking lot areas may be used to meet the storage requirements of Section 3.09 for the maximum design storm.

F. Pipelines shall be designed as required below:

1) The minimum pipe size for stormwater main lines shall be 12-inches. The minimum size for pipes connecting inlets to mainline shall be 8-inches.

2) The minimum slope for stormwater mainlines shall be as follows:

Inside Pipe Diameter (inches)	Minimum Pipe Slope		Design Capacity (CFS)	As-built Velocity (fps)
	Design	As-built		
12	0.00250	0.00200	1.786	2.034
15	0.00200	0.00150	2.897	2.044
18	0.00170	0.00120	4.343	2.065
24	0.00110	0.00080	7.523	2.042
30	0.00088	0.00058	12.200	2.018
36	0.00065	0.00045	17.051	2.007

Note: Mains installed at a flatter slope than the allowed as-built slope shall be re-laid by the contractor at their expense.

G. Minimum slope for pipes connecting inlets to mainlines shall be 0.0050.

H. Manholes shall be used to connect inlet lines to mainlines and at all locations where there is a change in direction and/or slope.

I. All ~~inside drops and~~ pollution control structures must be 60 inch or larger diameter structures and must be constructed with pipes; no partitions will be allowed.

J. All storm sewer pipe shall be one of the following materials meeting the requirements of the Standard Specifications:

- Smooth Walled Corrugated Polyethylene (ADS N-12 or equal)
- PVC Sewer Pipe (ASTM D-3034)
- Class 52 ductile iron
- PVC Pressure Pipe (AWWA C-900 or C-905)

Changes in pipe material may only occur at structures.

K. Pipe anchor blocks shall be shown at 20 feet on center where pipe slope exceeds 20%.

L. Horizontal Locations

1) Locate storm sewer mains in public right-of-way, within the paved road width, per City Standards.

2) Outside of right-of-way, locate utilities in easements through paved areas wherever practical. Particular attention should be given to avoiding landscaped areas where trees

may be planted.

M. Cap ends of existing storm sewer lines to be abandoned as follows:

1) Asbestos cement lines: use end cap coupling equal to ROMAC EC501.

2) Cast or ductile iron lines: use M.J. cap or plug

3) Clay or concrete lines: fill end of line with cement concrete minimum of 12 inches from end of line.

4) Plastic lines: use cap or plug fitting compatible with plastic pipe to be abandoned.

N. Depth of Bury (Cover) and Special Protection

1) Storm sewer pipe shall be installed with a minimum depth of bury 3 feet from finished grade unless otherwise approved by the City Engineer. In no case will the depth of bury from finished grade be less than 2 feet or greater than 20 feet. Pipe material shall be based on depth of bury from finished grade as outlined below:

2) 2.0 feet to 3.0 feet: Ductile iron pipe or AWWA C900.

3) 3.0 feet to 20 feet: Any pipe listed in 3.05G.3 above.

4) Storm sewer pipe shall be encased in steel casing when crossing under rockeries or retaining walls. The casing shall extend beyond footings or rockery face a minimum of 5 feet or the height of the wall or rockery, whichever is greater.

~~5) Changes in pipe material may only occur at structures.~~

O. Manholes

1) Maximum length of main line between manholes shall be 400 feet.

2) Where inlets connect to a manhole, the crown of the inlet shall be equal to or above the main line crown, but not to exceed 18 inches above the crown of the main line.

3) Manhole Sizing – Manholes shall be sized such that the structural legs between core holes in the wall of the manhole is no less than 8 inches.

a. The minimum angle between the incoming and the outgoing pipe shall be 90°, unless otherwise approved by the City Engineer. Pipe shall be radial with the center of manhole.

b. The above configurations shall provide adequate shelves and room for maintenance and performing T.V. inspections.

4) Access shall be provided to every manhole and shall be appropriately sized for maintenance vehicles as determined by the City Engineer. In necessary locations as determined by the city engineer, vehicle access may be provided to every other manhole.

P. A backwater analysis shall be performed under any of the following conditions:

1) Pipes with slopes less than 0.5 percent;

2) Pipes with subcritical flow velocities over 6.5 feet per second;

3) Stormwater main lines forming an angle or 45 degrees or less at junctions;

4) Pipes with inverts less than three feet deep.

5) When backwater analysis is required the hydraulic grade line shall be calculated for both the 25 and 100-year storm events. For the 25-year event there shall be a minimum of one foot of freeboard between the water surface and the top of any manhole or catch basin.

6) Backwater analysis shall be performed as described in the WSDOT Hydraulics Manual, current edition, as prepared by WSDOT.

Q. For storm drain systems that use laterals to drain into a centralized pipe system or catch basins, the following Storm Lateral notes shall be placed on the stormwater plans:

1) Storm laterals connecting to mains or catch basins shall be installed as a part of the street construction.
2) Storm laterals shall be installed with locate toning wire.
3) Cleanouts shall be installed at the edge of the right-of-way (home side for residential developments).
4) The homeowners' association (HOA) will be responsible for maintenance of the laterals. Public storm mains will be maintained and inspected by the City.
5) Backyard laterals will be privately owned and maintained. Access shall be provided for City inspections.

R. Horizontal setback requirements:

1) 5 feet minimum from covered parking.
2) 10 feet minimum from buildings and retaining walls, or equal to depth of pipe, whichever is greater.
3) 20 feet minimum easement shall be provided between buildings.
4) When passing between any two buildings (residential or commercial, etc.) which are 25 feet apart or less: the sewer line shall be oversized two (2) nominal pipe sizes above the capacity requirements between nearest manholes beyond limits of buildings.

3.06 Clearances / Other Utilities

A. Water services and inlet lines shall have at least 5 feet horizontal separation.

B. Check for crossing or parallel utilities. Maintain minimum vertical and horizontal clearances. Avoid crossing at highly acute angles (smallest angle measure between utilities should be 45 degrees).

C. Horizontal clearances between the storm sewer and all other utilities shall be a minimum, of 5 feet.

D. Vertical clearances between the storm sewer and all other utilities shall be a minimum of 1 foot.

3.07 Connections to Existing Systems

A. New storm sewer mains shall connect to existing storm sewer mains at existing manholes, or with new manhole on existing sewer per standard detail.

B. Where the new main is larger in diameter than the existing downstream main, check that capacity of existing main is not exceeded by flow from new main.

C. If connecting to an existing manhole which has access less than 24 inches in diameter and/or a concentric cone (manholes over 5 feet deep), the manhole shall be upgraded to include a new 24- inch frame and cover and/or eccentric cone.

3.08 Design of Stormwater Inlets

Stormwater inlets shall be designed and installed so that stormwater does not accumulate on or flow across roadways. The following general guidelines shall be used in designing stormwater inlets:

A. Inlet spacing shall be based upon the amount of water that each inlet can capture. Inlet calculations shall be included in the Stormwater Technical Information Report.

B. In lieu of providing inlet calculations, the following maximum inlet spacing may be used:

Roadway Slope (%)	Maximum Spacing (lf)
0.5 to 1	200
1 to 6	350
6 to 8	250
8 to 12	150
12 to 15	100

These spacings shall be allowed assuming roadway cross-sections from City standards are retained. If roadway sections vary from the approved standard cross-sections, an inlet spacing analysis shall be required to be completed following the requirements within the WSDOT Hydraulics Manual for on grade and sag locations per Section 5-4.

C. For most cases, inlets should be Type 1 catch basins with herring bone grates. For slopes greater than 4%, vaned grates should be used. At the bottom of sag vertical curbs, combination curb inlets shall be used.

D. Curb inlets may be used in certain situations with approval of the City Engineer.

E. Inlets should not be located directly in front of ADA ramps. Inlets should be located so as to reduce the amount of water passing in front of ADA ramps.

F. Catch basins shall be WSDOT Type 1 or Type 2, as necessary. Type 1 catch basins shall have a minimum catch of 18-inches below the invert. Type 2 catch basins shall have a minimum catch of 24-inches below the invert.

3.09 Design of Stormwater Detention Facilities

Stormwater detention facilities shall be designed to provide adequate access for maintenance. Underground detention facilities shall be designed to provide inspection access points at both ends of facility or where deemed necessary to provide proper inspection and maintenance.

The following general guidelines shall be used in designing stormwater detention facilities:

A. Facilities shall be designed in accordance with the 2019 Western Washington Manual, except as amended herein.

B. Stormwater facilities shall be fenced as required by the Western Washington ~~m~~Manual. Natural looking non-fenced facilities are strongly encouraged wherever possible.

C. Facilities shall be identified with a sign (see Section 3.14).

D. Facilities shall be provided with a paved access road with a maximum slope of 15%, unless approved by the City Engineer. Gravel access roads are allowed in private facilities that are to be privately owned and maintained. A turnaround shall be provided for all access roads unless approved by the City Engineer.

E. When sizing facilities and calculating the rate and volume of runoff leaving a project site, the following criteria shall be met:

1) The peak release rate for the two-year design storm after development shall not exceed one-half the pre-developed two-year design storm peak runoff rate.

2) The peak release rate for the 10- and 100-year design storms after development shall not exceed the respective pre-developed design storm peak runoff rates.

3) After meeting the requirements of subsections (D)(1) and (D)(2) of this section, the pond volume shall be increased by the following multiplication factor F: F = (composite curve number /46)-0.6. This correction factor is to be applied to the volume of the pond without changing its depth or the design of its outlet structure, which shall result in an increase in surface area.

3.10 Design of Stormwater Quality Treatment Facilities

A. Stormwater treatment facilities shall be designed in accordance with the Western Washington Manual. Facilities shall be designed to provide adequate access for maintenance.

B. Treatment facilities shall be sized to capture, hold and treat the water quality design storm as follows:

1) Water Quality Design Storm Volume: The volume of runoff predicted from a 24-hour storm with a six-month return frequency (a.k.a., six-month, 24-hour storm. This storm may be assumed to be 2/3 of the 2-year, 24-hour storm).

2) Water Quality Design Storm Flow Rate: The flow rate predicted from a 24-hour storm with a six-month return frequency (a.k.a., six-month, 24-hour storm).

C. Downstream of detention facilities the water quality design flow rate must be the full two-year release rate from the detention facility. Alternative methods may be used if they identify volumes and flow rates that are at least equivalent.

D. Water quality treatment of runoff from sidewalks, separated bike paths, roofs, fenced fire lanes, trails and infrequently used maintenance access roads is not required if the stormwater drains away from pollution generating surfaces. Runoff from these surfaces that mix with runoff from pollution generating surfaces will require treatment.

E. For vegetated wet facilities, including, but not limited to, wet biofiltration swales, stormwater treatment wetlands, wet ponds and wetpools, plantings are required to be plugs, rootstock or nursery stock. Seeding of wet facilities is not allowed unless it can be demonstrated to the satisfaction of the City Engineer that facility vegetation will be fully established before the facility receives stormwater.

F. Bioretention facilities shall be designed as detailed and defined in the Western Washington Manual. Bioretention facility sizing shall be determined with an approved Continuous Storm Water Modelling system (Western Washington Hydraulic Model [WWHM] or MGSflood).

G. The level of treatment for projects for basic or enhanced/metals will be determined from the Western Washington Manual. Unless identified below, projects will be required to meet basic level of treatment if triggered:

Enhanced treatment is required for the following project sites that discharge to fish-bearing streams, lakes, or to waters or conveyance systems tributary to fish-bearing streams or lakes:

- Industrial project sites
- Commercial project sites
- Multi-family project sites
- Roads with an AADT of 7,500 or greater

H. Where mechanical treatment is used within the public right-of-way, the following are the approved devices for use by the City:

1) Basic Treatment

a. StormFilter using ZPG Medial by Contech Engineered Solutions, LLC

b. PhosphoSorb Media will be allowed where required to meet Washington Department of Ecology TMDL requirements.

2) Enhanced/Metals Treatment - Filterra System by Contech Engineered Solutions, LLC

Where conflicts exist with the above listed systems, the developer's engineer may request a design modification following requirements Section 1.17 addressed to the City Engineer. Submittal of the design modification does not indicate approval of the alternative, and allowance to deviate from the required structures will be at the discretion of the City Engineer.

3.11 Oil/Water Separators

A. Oil/water separators shall be designed in accordance with Chapter 11 of Volume V of the Western Washington Manual.

B. The following development activities require American Petroleum Institute (API) or Coalescing Plate Separator (CPS)-type oil/water separators:

1) Industrial machinery and equipment, trucks and trailer, aircraft, parts and aerospace, railroad equipment
2) Log storage and sorting yards
3) Airfields and aircraft maintenance
4) Fleet vehicle yards
5) Railroads
6) Fueling stations
7) Retail/wholesale vehicle and equipment dealers
8) Vehicle maintenance and repair
9) Construction businesses including paving, heavy equipment storage and maintenance, storage of petroleum products (this does not include construction sites)
10) Other activities that exhibit a significant risk of high oil loading in runoff.

C. The following development activities shall require Spill Control (SC) type oil/water separators

1) Restaurants
2) Multi-family residential projects creating parking spaces for twenty-five (25) or more vehicles
3) Other activities where the risk of oil spills or illegal dumping of oil or grease is significant as determined by the City Engineer C.

D. For development activities cited in subsections B and C above, oil/water separators shall not be required on portions of a site where the risk of oil or grease spills or dumping is minimal.

3.12 Maintenance and Ownership.

A. Ownership of Stormwater Facilities – Private ownership of stormwater facilities is required where the facility will treat runoff from private property, as well as where private runoff and runoff from public right-of way will be combined prior to treatment. City ownership of stormwater facilities is required for all facilities that will treat only runoff from the right-of-way. Such facilities are to be located within a public right-of-way.

B. Acceptance of Ownership by the City.

1) Provisional Acceptance. Stormwater facilities which are to be owned by the City will be provisionally accepted for ownership upon the approval of the record drawings and approval of an inspection of the facilities by the City. Provisional acceptance of the facilities shall not relieve the applicant from any obligation to undertake any remedial measures to correct deficiencies in the design, construction, maintenance or operation of the facilities.

2) Final Acceptance of Ownership by the City. No sooner than twenty-four (24) months following the provisional acceptance of the facilities, the applicant shall notify the City Engineer that the facilities are eligible for final acceptance of ownership by the City. Prior to their final acceptance for ownership, the facilities shall be inspected to determine that they are in satisfactory condition. The City Engineer may require the applicant to conduct tests of the facilities to reasonably demonstrate that they are operating as designed and to the City standards for quality and quantity control as a condition of final acceptance. Upon approval of the facilities by the City Engineer and all necessary ownerships and easements entitling the City to properly access and maintain the facilities have been conveyed to the City and recorded with the County Auditor, they will be finally accepted for ownership by the City.

C. Maintenance of Stormwater Facilities.

1) City-Owned Facilities.

a. Initial Maintenance and Repair. For a period of at least two (2) years following the provisional acceptance of stormwater facilities or thereafter until the facilities are finally accepted by the City, the developer constructing the facilities shall maintain, repair, redesign, reconstruct the facilities to ensure that they operate as designed and to the City standards for quality and quantity control. This obligation shall extend to remedying any damage caused to the facilities by builders or other third parties during the initial maintenance period. The required maintenance shall be performed according to the Stormwater Facilities Maintenance Manual as adopted by Clark County, Washington and as stated in the Stormwater Technical Information Report.

b. During the initial maintenance period, remedial work to correct deficiencies shall be the responsibility of the developer and shall be completed prior to final acceptance. Required remedial work to correct maintenance and construction deficiencies shall be completed by the applicant prior to final acceptance.

c. Long-Term Maintenance. Following their final acceptance for City ownership, the City shall maintain stormwater facilities.

2) Privately Owned Facilities.

a. Responsibility for Maintenance. The City shall not be responsible for maintaining privately owned stormwater facilities. For stormwater facilities for which the City will not provide ~~long-term~~ maintenance, the developer shall make arrangements with the existing or future (as appropriate) occupants or owners of the subject property for assumption of maintenance in accordance with the Western Washington Manual. The City Engineer ~~prior to City approval of the final stormwater plan~~ shall ~~approve~~ have approval of such arrangements prior to City approval of the final stormwater plan. Final plats shall specify the party(ies) responsible for long-term maintenance of stormwater facilities within the Plat notes for the subdivision or short plat.

b. Initial Maintenance and Repair. For a period of at least two (2) years following the provisional acceptance of stormwater facilities or thereafter until the facilities are finally accepted by the City, the developer constructing the facilities shall maintain, repair, redesign, reconstruct the facilities to ensure that they operate as designed and

to the City standards for quality and quantity control. This obligation shall extend to remedying any damage caused to the facilities by builders or other third parties during the initial maintenance period.

c. During the initial maintenance period, remedial work to correct deficiencies shall be the responsibility of the developer and shall be completed prior to final acceptance. Required remedial work to correct maintenance and construction deficiencies shall be completed by the applicant prior to final acceptance.

d. Long-Term Maintenance. Following final acceptance, the responsible parties shall maintain stormwater facilities.

e. Easements Required. Easements or a covenant acceptable to the City Engineer shall be provided to the City for purposes of inspection of privately maintained facilities. The minimum dimensions of easements for stormwater facilities are as follows:

(i) Easements shall allow access to all areas within the pond and drainage structures by standard maintenance equipment vehicles

(ii) Widths of easements for conveyance facilities shall be a minimum of 15 foot in width, unless otherwise approved or required by the City Engineer.

(iii) Commercial sites shall provide covenant over the property for access and inspection for City staff of storm infrastructure and facilities.

~~3.13~~3.11 Location of Stormwater Facilities

A. Runoff treatment and runoff control facilities shall be located prior to the point of discharge into a stream, lake, or fish-bearing water or prior to discharge to groundwater.

B. Unless otherwise approved by the City Engineer, infiltration systems shall be located as follows:

1) 50 feet from the top of any slope greater than 15%;

2) 100 feet from domestic and municipal water supply wells; and

3) 100 feet from existing or proposed septic drain fields.

4) Located to prevent influencing existing or proposed building foundations.

C. Swales and other stormwater treatment facilities using biofiltration shall be located outside easements and corridors used by phone, electric, water, natural gas, and other utilities unless the utilities are installed prior to construction of the biofiltration system.

D. Stormwater facilities other than closed conveyance systems shall be located at least one hundred feet from existing and proposed on-site sewage system drain fields.

E. Stormwater facilities located in critical area buffers shall comply with the applicable siting restrictions in SMC 18.13.

~~3.14~~3.12 Signing and Fencing

A. Above ground detention facilities shall be fenced following the requirements of the Western Washington Manual.

B. All facilities shall be provided with a free-standing sign as placed for maximum visibility from adjacent streets, sidewalks, and path follows:

1) Sign shall be on a 48-inch by 24-inch aluminum sheet of 0.1250 gauge

a. Top of sign no higher than 42 inches from ground surface.

Formatted: Outline numbered + Level: 2 + Numbering Style: 1, 2, 3, … + Start at: 10 + Alignment: Left + Aligned at: 0" + Indent at: 0.5"

Formatted: Outline numbered + Level: 2 + Numbering Style: 1, 2, 3, … + Start at: 10 + Alignment: Left + Aligned at: 0" + Indent at: 0.5"

Formatted: Outline numbered + Level: 3 + Numbering Style: A, B, C, … + Start at: 1 + Alignment: Left + Aligned at: 0.25" + Indent at:

b. Do not block any access road.

c. Do not place within 6 feet of structural facilities (e.g. manholes, spillways, pipe inlets).

2) Sheeting to be non-reflective vinyl

3) Lettering on signage shall be silk screen enamel where possible, or vinyl letters.

4) Sign background to be of a beige color, with teal letters.

a. Sign to have 1/8-inch-wide white border with located 1/4 inch from edge of sign

5) Text shall be Helvetica Condensed with the following heights:

a. Main Title: 3-inch height

i. Main title shall describe the main facility type (i.e. Stormwater Pond, Stormwater Treatment Wetland, etc.)

b. Sub-Title: 1-1/2 inch height

i. Sub-title shall describe maintainer of facility and contact information.

c. Text: 1-inch height

i. Text shall include educational information about the facility and its function.

ii. If facility is lined, text shall reflect this feature.

6) All text shall be located no closer than 1-3/4-inch from border.

~~B.~~C. Posts shall be made of pressure treated 4-inch by 4-inch posts and shall extend 1-1/2 inch above sign with beveled tops. Post shall be installed in 8-inch diameter concrete filled holes 30-inch into the ground.