

## **CHAPTER 3 - 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, and utility review.
- 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.

### **3.01 Planning Criteria**

- A. The City of Stevenson has established the 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. Design and construction of drainage facilities, including but not limited to: open channels, conveyance pipe, and inlets shall be in compliance with the latest addition of the City's Ordinances, these Standards, the Standard Details and the latest issue or revision of "Stormwater Management Manual for the Puget Sound Basin" (hereinafter referred to as the Puget Sound Manual) prepared by the Washington State Department of Ecology.
- D. Except for those natural water courses shown in the City's most recent Stormwater Master Plan as designated Regional Facilities, storm drainage pipes shall be extended through and to the extremes of the property being developed along the natural drainageways, to provide connection points for future development of unserved property as determined by the City.
- E. 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 dry-wells 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.

- F. Provisions must be made for stormwater from private property to remain on private property wherever feasible. Runoff from that portion of driveways behind the back of sidewalk (outside the right-of-way) shall not be permitted to drain directly to the street.

### **3.02 General Design Requirements**

- A. The City of Stevenson has adopted the Puget Sound Manual with the following notations:

1. Stormwater quantity management requirements are amended by Section 3.02B of these Standards.
2. All inside drops and pollution control structures must be constructed with pipe; no partitions will be allowed.
3. All inside drops and pollution control manholes must be 60 inch or larger diameter structures.
4. All pipe shall be installed with watertight joints.
5. All backfill material shall be referenced per the Standard Specifications.
6. 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 will be common areas in planned unit developments, and/or City right-of-ways, or as otherwise approved by the City Engineer.

- B. Water Quantity Standards

1. All proposed site developments shall convey stormwater to regional facilities in accordance with the City's Stormwater Master Plan, latest revision. Where the City Engineer authorizes in writing a waiver from the regional facility requirement, all development on sites one-half (0.5) acre or greater in area shall be required to

provide on-site detention.

2. The minimum standards for the design and construction of stormwater quantity facilities in the City of Stevenson shall be the same as the current standards of the Puget Sound Manual as amended by the Skamania County, Washington Stormwater Control Ordinance, Section 13.25.220 AQuantity Control@, dated January 26, 1994, or the latest edition, including any technical memorandum provided by the County that amends or clarifies the applicable sections of the ordinance.
3. If a site is proposed to be constructed in phases, the first phase shall have a stormwater quantity facility designed and built to accommodate the ultimate development of the site.
4. Drain inlets shall be curb inlets per the Standard Drawings. Curb inlets shall be placed so that no more than 7,000 square feet of hard surfacing, pavement and driveways which drain to the street including top of curb and sidewalk where sidewalk is adjacent to the curb, shall drain to each drain inlet.
5. Storm drain conveyance systems shall be sized to convey the 25-year storm event with zero property damage at the 100-year storm event. Where a natural drainageway is designated to remain in open-space as shown on the City's Comprehensive Plan, and that drainageway is not part of the regional conveyance facility, stormwater shall be conveyed through that drainageway by closed conduit sized for the 5-year storm event. All storm sewer pipe and culverts used in the City shall be gasketed pipe meeting the requirements of the Standard Specifications.
6. When the above storm detention requirement is to be met by creating a ponded area in a parking lot, the following shall apply:
  - a. Maximum depth of standing water in all parking lot ponds shall be one (1) foot. No more than 25 percent of the entire number of parking stalls in a parking lot shall be inundated by a parking lot pond during the design storm.
  - b. No parking lot ponds shall be located within the primary ingress/egress portions of a site. Parking lot ponding shall be so designed that, at maximum water level for the design storm, a minimum twenty (20) foot wide emergency vehicle lane to the buildings will remain unflooded, including during system overflow condition.

- c. Slopes on all parking lot surface ponds should not be less than one (1) percent nor exceed five (5) percent in areas designed for vehicular traffic.
- d. All parking lot ponds shall be designed and constructed in such a manner so as to provide a maximum water surface elevation 0.25 feet lower than any and all structures designed to contain the ponding.
- e. Where curbing is used to contain a parking lot pond, extruded curbing shall not be used. A public standard "vertical" type curb will be required.
- f. No parking lot ponding shall occur at an elevation more than one (1) foot below the lowest habitable floor elevation of buildings within the proximity of the pond. Under no circumstances shall ponds or other detention facilities be designed in such a manner that system failure would cause flooding in any habitable building area.
- g. No parking lot ponding shall be designed for parking lots under buildings. Whenever the possibility of flooding an underground parking facility or other uninhabited building area exists, care shall be taken to floodproof electrical equipment areas and other building appurtenances with overflow and/or private pump systems being provided to drain such a flooded facility.
- h. Parking lot pond construction plans shall include a note stating that "Grading is critical to functioning of detention system and plan must be strictly followed." Parking lot design volumes shall be shown on the plans and the pond volume inspected prior to paving. The developer's engineer shall certify that the design pond volume has been constructed.

#### C. Water Quality Standards

The minimum standards for the design and construction of stormwater quality facilities in the City of Stevenson shall be the same as the current standards of the Puget Sound Manual as amended by the Skamania County, Washington Stormwater Control Ordinance, Section 13.25.210 AQuality Control@, dated January 26, 1994, or the latest edition, including any technical memorandum provided by the County that amends or clarifies the applicable sections of the ordinance.

#### D. Design of Conveyance Facilities

Manholes and pipelines shall be designed in accordance with the requirements specified for sanitary sewers as outlined in Chapter 4 of these Standards.