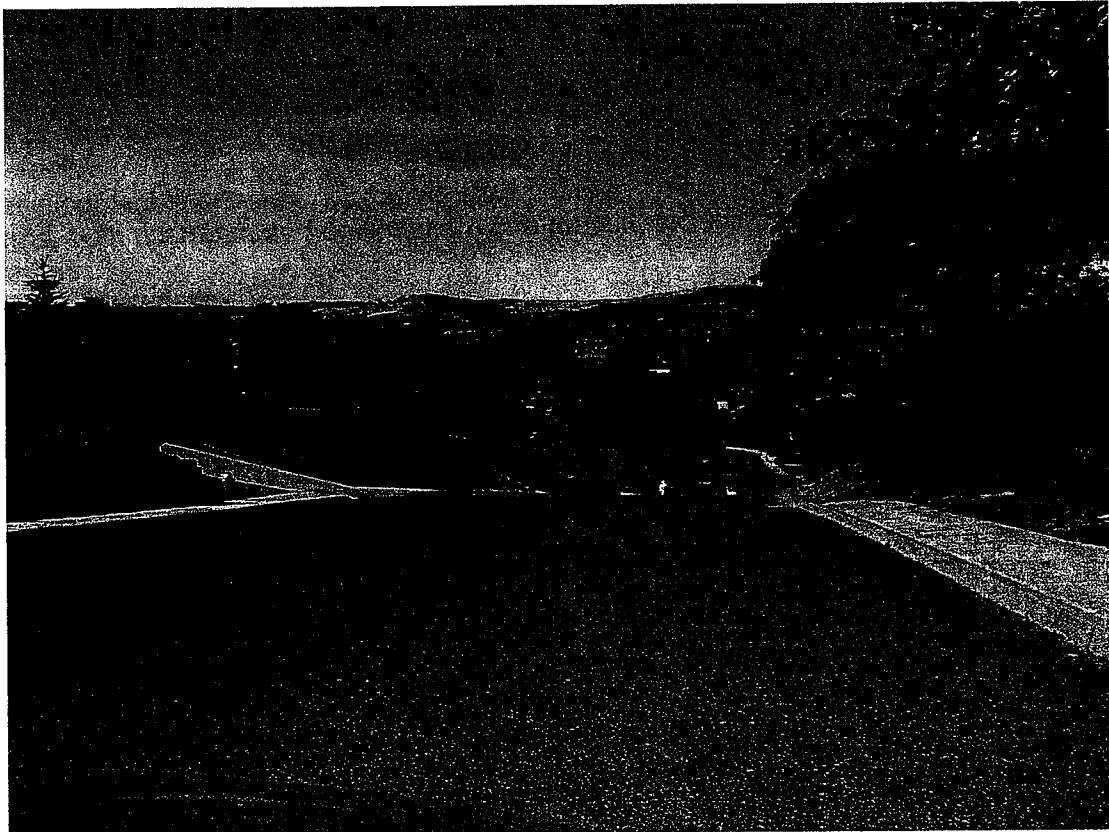


# **City of The Dalles**

*Storm Water Master Plan*

## **Appendix F** **Development Guidelines**



**Kennedy/Jenks Consultants**  

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**Engineers & Scientists**

## City of The Dalles Stormwater Development Guidelines (Final Draft)

### General

All stormwater system elements (including, but not limited to conveyance systems, water quality facilities, water quantity facilities) shall be designed and constructed in accordance with all applicable rules and regulations of the City and all applicable federal, state and local statutes and rules.

### Flow Development

The engineer may use various methods for hydrology analysis, but the method of hydraulic calculations shall be subject to the City's approval. The City's preferred method is the Rational Method. All public conveyance system elements shall be designed to pass the 25 year, 24-hour storm event based on NOAA Atlas 2 Volume X isopluvial maps.

### System Layout

Public storm sewer systems shall be extended to the most distant upstream parcel boundary(s) to accommodate current and future storm flows entering the property, unless otherwise approved by the City. The City may require that a storm pipeline that serves or may serve more than one property be a public system.

Site development improvement projects shall address on-site and offsite drainage concerns, both upstream and downstream of a project, including but not limited to the following:

- Modifications to the existing on-site storm drainage facilities shall not restrict flows creating backwater onto off-site property to levels greater than the existing situation.
- Storm drainage facilities shall be designed and constructed to accommodate all future full build-out flows generated from upstream property based upon the most recent approved City Comprehensive Land Use Plan.
- The design of storm drainage facilities shall analyze the impact of restrictions downstream of the project site. Downstream restrictions that create on-site backwater may be required to be removed by the developer, at the City's discretion, or the on-site backwater shall be addressed in the design of the development's storm system. The removal of downstream obstructions shall not be allowed if this removal creates downstream capacity problems.

### Pipe Design

- All new pipes shall be at least 12-inches in diameter.
- Pipes shall be aligned sufficient to create a scouring velocity greater than 3 feet per second, unless otherwise approved in advance by the City Engineer.
- All pipes shall be sized for the design storm event with a  $d/D$  ratio less than 1.

## CITY OF THE DALLES – STORM DRAINAGE CRITERIA SUMMARY

Item	Criteria
Design Storm Recurrence Interval	25-year drainage system
Minimum Flow Velocity	3 feet per second, pipe flowing full unless approved otherwise by the City Engineer
Storm Drain Pipe Size (minimum)	12 inches
Pipe Material: - less than 18 inches in diameter  - 18 inches or greater in diameter	PVC 3034  PVC 3034 ADS Concrete
Pipe Design Life	75 years
Hydrologic Computations	Rational Method: -for drainage areas less than 200 acres -using ODOT Hydraulics Manual Procedures Hydrograph Analysis: -for drainage areas greater than 200 acres Other Methods: -as approved in advance by the City Engineer
Manhole Spacing (maximum)	300 feet unless approved otherwise by the City Engineer
Rainfall	Drainage Areas less than 200 acres -ODOT Zone 11 Intensity Duration Frequency Curves (see below)  Drainage Areas greater than 200 acres -NOAA Atlas 2 (see below)

References:

ODOT Hydraulics Manual

[http://www.oregon.gov/ODOT/HWY/GEOENVIRONMENTAL/hyd\\_manual\\_info.shtml](http://www.oregon.gov/ODOT/HWY/GEOENVIRONMENTAL/hyd_manual_info.shtml)

NOAA Atlas 2

<http://www.wrcc.dri.edu/pcpnfreq.html>