

Change Pages for the Stormwater Management Manual 2012 Edition

Revision Date: February 29, 2012

Please print the following pages and replace the existing pages in your Stormwater Management Manual 2012 Edition. These pages reflect recent changes or corrections to the information presented in the manual.

Changes included:

Volume 3, Chapter 10, page 3-121 – the text in the second bulleted item was changed to reflect a maximum surface run between catch basins of 350 feet.

Volume 5, Chapter 3, page 5-8 – the footnotes in the table were renumbered for consistency.

10.3.3 Open Channel Design Criteria

- **Open channels** shall be designed to provide required conveyance capacity while minimizing erosion and allowing for aesthetics, habitat preservation, and enhancement. See Section 9.3 for open channel sizing criteria.
- **An access easement for maintenance** is required along all constructed channels located on private property. Required easement widths and building setback lines vary with channel top width.
- **Channel cross-section geometry** shall be trapezoidal, triangular, parabolic, or segmental as shown in Figure 3 - 36 through Figure 3 - 38. Side slopes shall be no steeper than 3:1 for vegetation-lined channels and 2:1 for rock-lined channels.
- **Vegetation-lined channels** shall have bottom slope gradients of 6% or less and a maximum velocity at design flow of 5 fps (see Table 3 - 20).
- **Rock-lined channels or bank stabilization of natural channels** shall be used when design flow velocities exceed 5 feet per second. Rock stabilization shall be in accordance with Table 3 - 20 or stabilized with bioengineering methods as described above in "Constructed Channels."

10.4 Structures

All structures to be maintained by the City of Tacoma shall meet the requirements of the Public Works Design Manual. All other structures must meet WSDOT standards.

The following criteria shall be used when designing a conveyance system that utilizes catch basins or manholes:

- Connections to the storm system shall be made at a structure. Tributary connections shall be made at 90° to the main. Slight variations may be allowed.
- The design event per Chapter 9 must be analyzed for proposed catch basin installations when grate capacity is a concern. The maximum surface run between catch basins shall not exceed 350 feet.
- Catch basin (or manhole) diameter shall be determined by pipe diameter and orientation at the junction structure. A plan view of the junction structure, drawn to scale, will be required when more than four pipes enter the structure on the same plane, or if angles of approach and clearance between pipes is of concern. The plan view (and sections if necessary) must demonstrate a minimum 8-inch interior distance between knockouts for 48-inch, 54-inch and 60-inch manholes, and a 12-inch interior distance between knockouts for 72-inch to 120-inch manholes.
- Type 1 & Type 1L basin height shall not exceed eight (8) feet.
- Type 2 (48-inch minimum diameter) catch basins or manholes shall be used at the following locations or for the following situations:
 - When overall structure height exceeds 8 feet.
 - When all pipes tying into the structure exceed the limits set for Type 1 structures.
 - All Type 2 catch basins shall be specifically approved by Environmental Services.
- Catch basin grates shall be vaned grates.
- Quarry spalls shall not be placed around inlets, to accommodate maintenance.
- The maximum slope of ground surface for a radius of 5 feet around a catch basin grate shall be 3:1. The preferred slope is 5:1 to facilitate maintenance access.

- **Emerging Stormwater Treatment Technologies for Enhanced Treatment** – See Chapter 12

Table 5 - 2: Treatment Trains for Enhanced Treatment

| First Basic Treatment Facility | Second Treatment Facility |
|---|---|
| Biofiltration Swale | Basic Sand Filter or Sand Filter Vault or Media Filter ^a |
| Filter Strip | Linear Sand Filter with no presettling cell needed |
| Linear Sand Filter | Filter Strip |
| Basic Wetpond | Basic Sand Filter or Sand Filter Vault or Media Filter ^a |
| Wetvault | Basic Sand Filter or Sand Filter Vault or Media Filter ^a |
| Basic Combined Detention/Wetpool | Basic Sand Filter or Sand Filter Vault or Media Filter ^a |
| Basic Sand Filter or Sand Filter Vault with a presettling cell if the filter isn't preceded by a detention facility | Media Filter ^a |

a. The media must be of a type approved for use by Ecology. Refer to Ecology's website.

2.4 Basic Treatment Menu

2.4.1 Performance Goal

The basic treatment menu facility options should achieve 80% removal of total suspended solids (TSS) for influent concentrations ranging from 100 to 200 mg/L. For influent concentrations greater than 200 mg/l, a higher treatment goal is appropriate. For influent concentrations less than 100 mg/l, the facilities should achieve an effluent goal of 20 mg/l total suspended solids.

2.4.2 Options

Any one of the following options may be chosen to satisfy the basic treatment requirement:

- **Infiltration** – See Chapter 7
- **Sand Filters** – See Chapter 8
- **Biofiltration Swales** – See Chapter 9
- **Filter Strips** – See Chapter 9
- **Basic Wetpond** – See Chapter 10