OPERATION & MAINTENANCE MANUAL

Water Quality Biofiltration Swale

Manual prepared: April 2019

DFI No. D00854



Figure 1: DFI No. D00854, looking northwest

Identification

Drainage Facility ID (DFI): D00854 Facility Type: Water Quality Biofiltration Swale Construction Drawings: Private Developer for 99W turn lane Location: City of Tualatin Highway No.: 091 (99W) Mile Post: 12.41–12.49, median

1. Manual Purpose

The purpose of this manual is to outline inspection needs and summarize maintenance actions.

2. Facility Location

The location map below details the facility location. The highway, mile posts, side streets, access location, and stormwater flow directions are noted on the map.

Facility location type: Roadway median

Flow direction: northwest



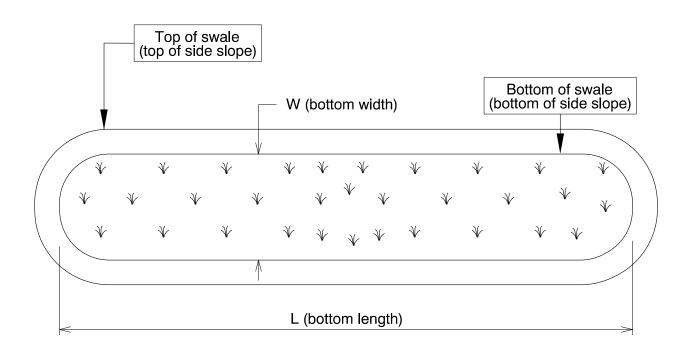
Figure 2: Facility location map

3. Facility Summary

The length and width of a swale is based on the bottom dimensions.

The bottom length and bottom width of the swale is:

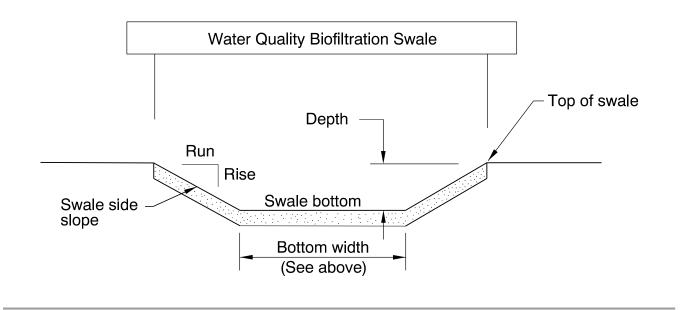
| Bottom Length (feet) | Bottom Width (feet) |
|----------------------|---------------------|
| 422 | 8 |



The depth of the swale is the vertical distance measured from the bottom of the swale to the top. The slope of the swale sides is presented by a vertical distance (rise) followed by the horizontal distance (run).

Depth and side slopes:

| Depth (feet) | Rise (feet) | Run (feet) |
|--------------|-------------|------------|
| 3 | 1 | 2 |



<u>Site Specific Information</u>: This facility is a non-engineered swale, developed and constructed by a private company during a turn-lane addition. There is a small riprap pad where drainage enters the swale. The swale flows north to an outlet under the large tree seen in Figure 1. Because this facility was not an ODOT project, there are no plan sets or appendices to accompany the manual. The facility does not contain all of the components found in a typical swale. The only structures requiring maintenance are the manhole that feeds the swale, the pipe at the entry, and the grated outlet under the tree. The facility will also require mowing.

4. Facility Access

Maintenance access to the facility:

| □Roadside pad | ⊠Roadside shoulder |
|------------------------|---------------------------|
| □Access road with Gate | □Access road without Gate |



Figure 3: Shoulder access

5

5. Operational Components / Maintenance Items

Classification

This facility is classified as an:

| On-line Swale | Ø Off-line Swale |
|--------------------------------------|-------------------------------------|
| A swale that does not include a high | A swale that treats low/small flows |
| flow bypass component; flow drains | and diverts high flows using a |
| into and through the facility | bypass component |

Bypass Component

This facility includes a high flow bypass component:

| 🗆 No | 🛛 Yes |
|---|--|
| There is no bypass component. High flows drains into and through the facility | There is a bypass component. Only low/small flows drain into the swale. High flows are diverted around the swale using a bypass component |

Operational Components

A swale has many components that assist with treatment, conveyance, and reducing flow velocity to minimize erosion. The components in use can vary depending if the facility was designed to operate on-line or off-line. The facility components table (**Table 1**) has been provided to highlight the applicable components for this facility. The component is in use when the box contains an "x" (e.g. \boxtimes).

The Standard Operation Manual for Water Quality Biofiltration Swales (implemented March 2017) outlines facility operation, typical footprint configuration, and component definitions and details. A link to the manual is attached to the feature marker in TransGIS.

https://gis.odot.state.or.us/TransGIS/

Operational Plan

The applicable standard operational plan for this facility is:

| Operational Plan A | Operational Plan B | Operational Plan C |
|---|---|---|
| An on-line swale with roadside ditches | An on-line swale with piped inlets and outlets | An off-line swale with a piped high flow bypass |
| A standard operational plan illustrates the general facility footprint configuration and explains the | | |

A standard operational plan illustrates the general facility footprint configuration and explains the purpose of each facility component. Operational plans (A, B, C) are provided in the Standard Operation Manual.

Maintenance Items

Operational components marked in **Table 1** should be inspected and maintained according to Section 7. Each facility component is defined and detailed in the Standard Operation Manual using the associated ID number indicated below.

| Manholes/Structures Image: Structures Pre-treatment manhole S1 Weir type flow splitter/flow splitter manhole S2 Orifice type flow splitter/flow splitter manhole S3 Standard manhole S4 Swale Inlet S5 Pavement sheet flow S5 Inlet Pipe (s) S66 Open channel inlet S7 Riprap pad S8 Ground Cover S11 Grass bottom S9 Grass side slopes S11 Plantings S12 Underground Components S14 Perforated pipe S15 Porous pavers (access grid) S15 Porous pavers (access grid) S17 Anchored board (midpoint of swale or every 50 feet along swale bottom) S18 Other: describe type S13 Swale Outlet S20 Outhality Pipe (s) S23 Outher Pipe (s) S23 Outher lescribe type S23 Open channel outlet S22 Auxiliary Outlet: describe type S23 Outfall Type S24 | Table 1: Swale Components | | ID # |
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6. Maintenance

Maintenance Frequency/Maintain Records

- a. Inspect annually. Preferably prior to the rainy season.
- b. Clean and maintain as necessary. Refer to Activity 125 for conditions when maintenance is needed.
- c. Keep a record of inspections, maintenance, and repairs.

Maintenance Guide/Maintenance Actions

The ODOT Routine Road Maintenance Water Quality and Habitat Guide (the *Blue Book*) outlines the standard maintenance actions for water quality facilities under Activity 125.

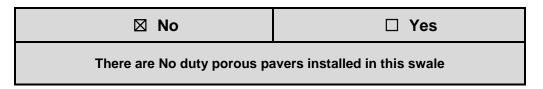
There are standard maintenance tables for standard ODOT designs. The maintenance tables describe the maintenance component, the defect or problem, the condition when maintenance is needed, and the recommended maintenance to correct the problem. Use the following tables to maintain ODOT swales:

- Table 1 (General Maintenance): Contains general maintenance and inspection guidelines that are applicable to all ODOT water quality facilities
- Table 3 (Maintenance of Water Quality or Biofiltration Swales): Contains maintenance information for swales

The *Blue Book* can be viewed at the following website: <u>http://www.oregon.gov/ODOT/Maintenance/Documents/blue_book.pdf</u>

7. Limitations

Access grid installed:



Swales are designed to allow equipment access along the bottom. If an access grid is **NOT** installed, vehicles entering the swale can create depressions (tire ruts), damage vegetation, and damage structural components (e.g. flow spreaders). These conditions may result in poor treatment and drainage performance.

Equipment wheels should be kept on the tops and side slopes. Mower arms may be run along the swale bottom.

8. Waste Material Handling

Material removed from the facility is defined as waste by the Department of Environmental Quality (DEQ). Refer to the roadwaste section of the ODOT Maintenance Yard Environmental Management System (EMS) Policy and Procedures Manual for disposal options:

http://www.oregon.gov/ODOT/Maintenance/Documents/ems_manual.pdf

Contact any of the following for more detailed information about management of waste materials found on site:

| ODOT Clean Water Unit | (503) 986-3008 |
|-----------------------------------|----------------|
| ODOT Statewide Hazmat Coordinator | (503) 667-7442 |
| ODOT Region 1 Hazmat Coordinator | (503) 731-8290 |
| ODOT Region 2 Hazmat Coordinator | (503) 986-2647 |
| ODOT Region 3 Hazmat Coordinator | (541) 957-3594 |
| ODOT Region 4 Hazmat Coordinator | (541) 388-6186 |
| ODOT Region 5 Hazmat Coordinator | (541) 963-1590 |
| ODEQ Northwest Region Office | (503) 229-5263 |

A Appendix A – Site Specific Operational Plan

Contents:

There are no plans for this facility. See photo diagram below.

Facility Specific O&M Manual – Swales



Facility Specific O&M Manual – Swales

D00854

B Appendix B – Project Contract Plans

Contents:

There are no plans for this facility.