OPERATION & MAINTENANCE MANUAL

Water Quality Biofiltration Swale

Manual prepared: October 2018

DFI No. D01202 and D01203

Figure 1: DFI No. D01202, looking [cardinal direction]

Figure 2: DFI No. D01203, looking [cardinal direction]

1. Identification

Drainage Facility ID (DFI):	D01202
Facility Type:	Water Quality Biofiltration Swale
Construction Drawings:	(V-File Numbers) 52V-019
Location:	District: 3
	Highway No.: 153
	Mile Post: 4.457 to 4.476 [left side]

Drainage Facility ID (DFI):	D01203
Facility Type:	Water Quality Biofiltration Swale
Construction Drawings:	(V-File Numbers) 52V-019

Location:

District: 3
Highway No.: 153
Mile Post: 4.457 to 4.476 [right side]

2. Manual Purpose

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

3. 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.

Flow direction: west

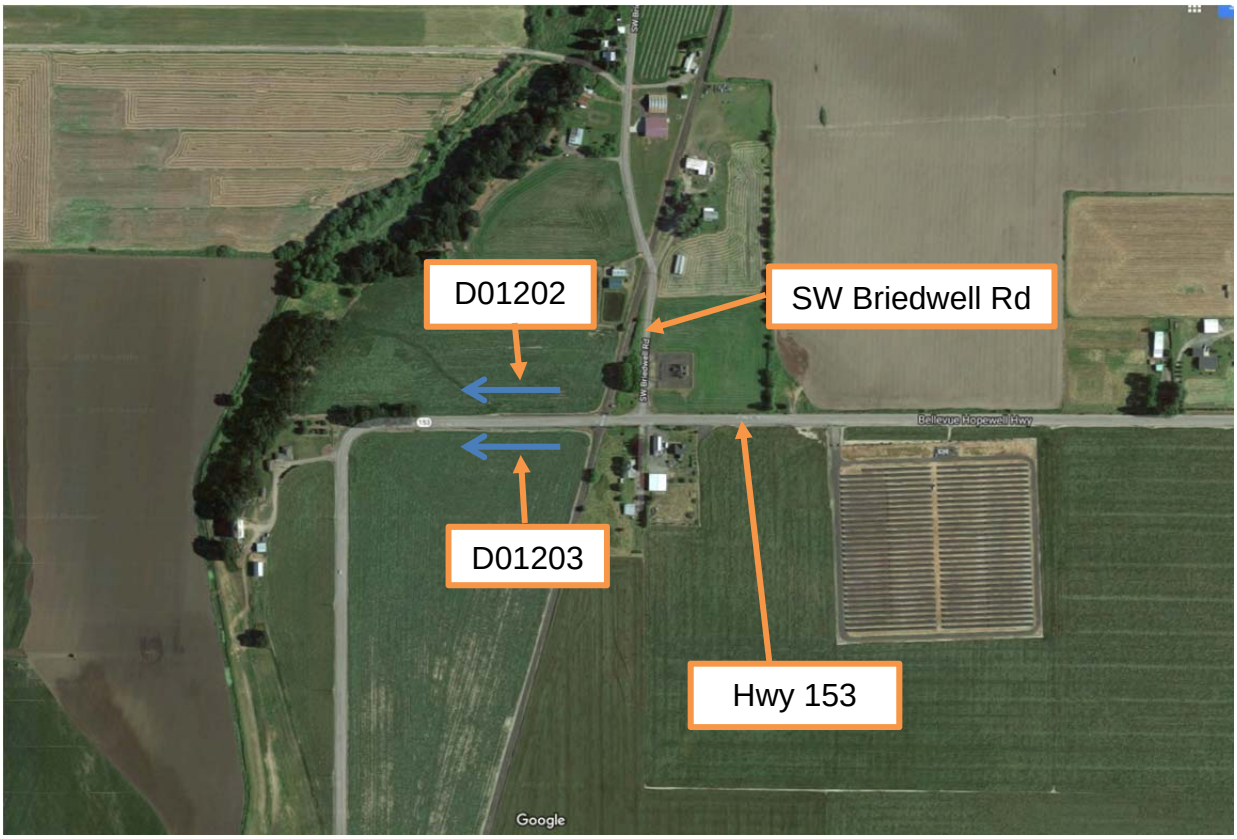


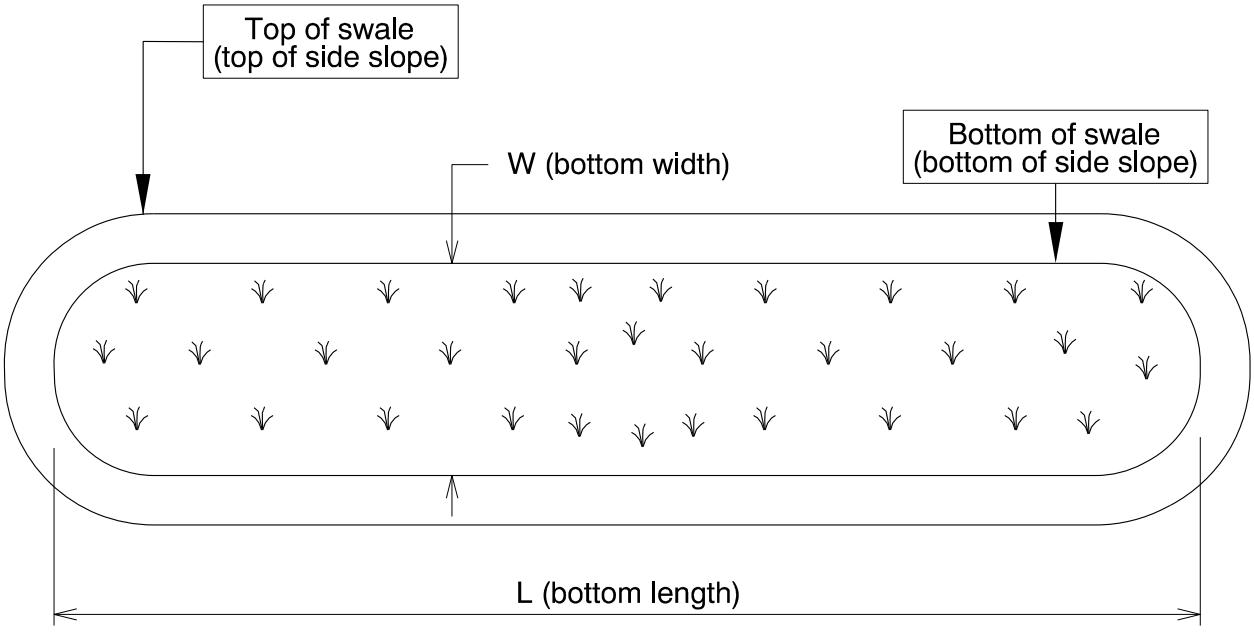
Figure 3: Facility location map

4. 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:

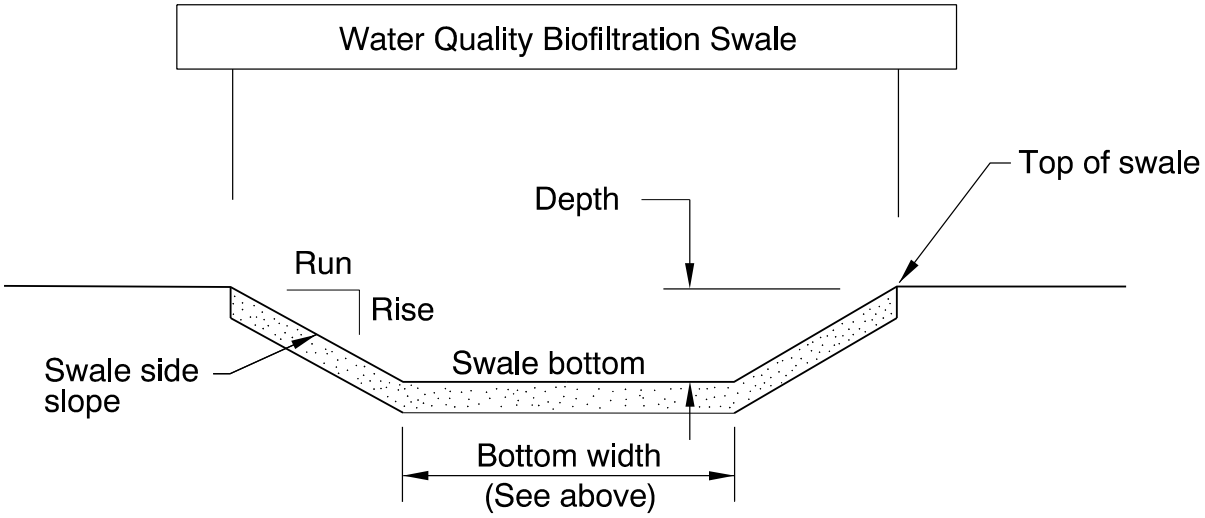
Facility ID	Bottom Length (feet)	Bottom Width (feet)
D01202	**100**	**3**
D01203	**100**	**3**



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)
2	1	3



Site Specific Information: These facilities are both designed with a Water Quality mix consisting of 70/30 topsoil to sand mixture.

5. Facility Access

Maintenance access to the facility:

☐Roadside pad	☒Roadside shoulder
☐Access road with Gate	☐Access road without Gate

Figure 4: [insert post construction facility access photo and caption text for D01202]

Figure 5: [insert post construction facility access photo and caption text for D01202]

6. Operational Components / Maintenance Items

Classification

This facility is classified as an:

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

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
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.		

See Appendix A for the site specific operational plan.

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.

Table 1: Swale Components		ID #
Manholes/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		
Pavement sheet flow	☐	**S5**
Inlet Pipe (s)	☐	**S6**
Open channel inlet	☒	**S7**
Riprap pad	☐	**S8**
Ground Cover		
Grass bottom	☒	**S9**
Grass side slopes	☒	**S10**
Granular drain rock	☐	**S11**
Plantings	☐	**S12**
Underground Components		
Geotextile fabric	☐	**S13**
Water quality mix	☒	**S14**
Perforated pipe	☐	**S15**
Porous pavers (access grid)	☐	**S16**
Flow Spreader		
Rock basin (used at inlet)	☐	**S17**
Anchored board (midpoint of swale or every 50 feet along swale bottom)	☐	**S18**
Other: landscape matting	☒	**S19**
Swale Outlet		
Catch basin with grate	☐	**S20**
Outlet Pipe (s)	☐	**S21**

Open channel outlet	☒	**S22**
Auxiliary Outlet: describe type	☐	**S23**
Outfall Type		
Waterbody (**C**reek/**L**ake/**O**cean)	☐ **C** ☐ **L** ☐**O**	**S24**
Ditch	☒	**S25**
Storm drain system	☐	**S26**
Outfall Components		
Riprap pad	☐	**S27**
Riprap bank protection	☐	**S28**

7. 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:
http://www.oregon.gov/ODOT/Maintenance/Documents/blue_book.pdf

8. Limitations

Access grid installed:

☒ No	☐ Yes
There are no porous pavers installed in this swale	

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.

9. 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

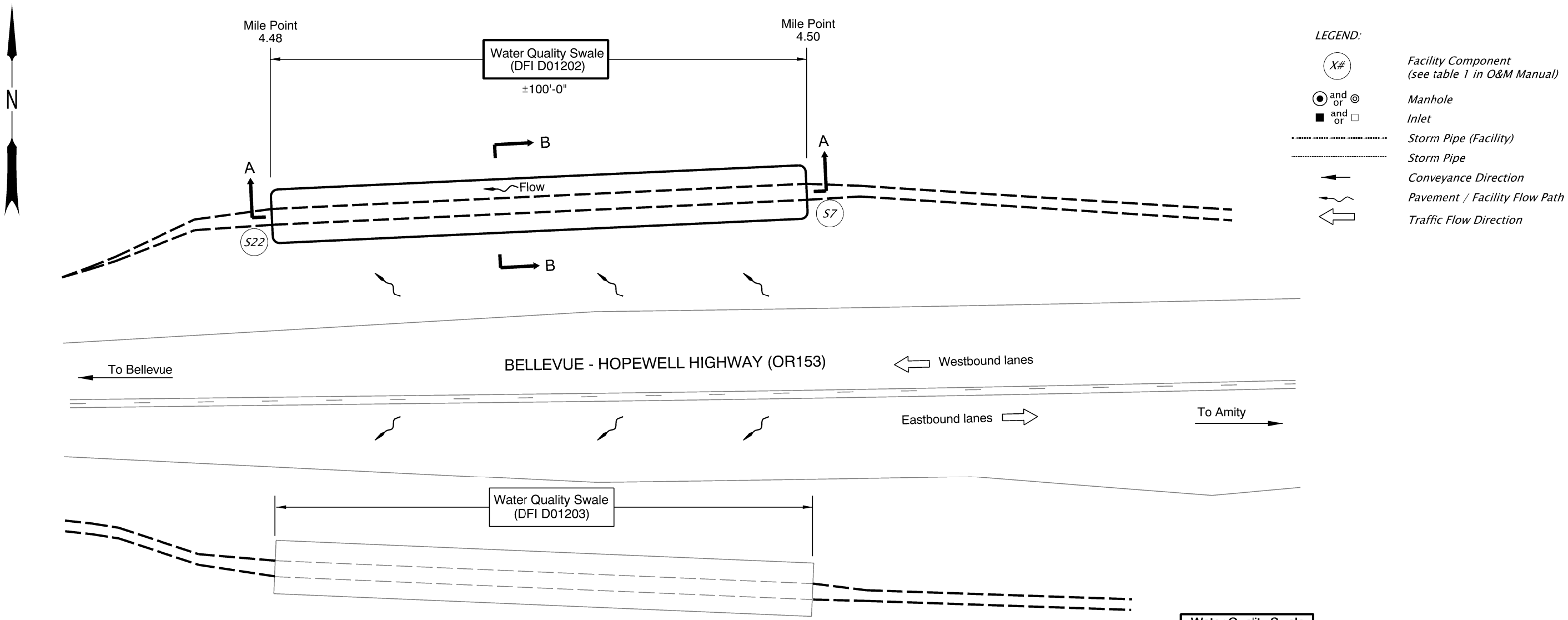
Contact any of the following for more detailed information about management of waste materials found on site:

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

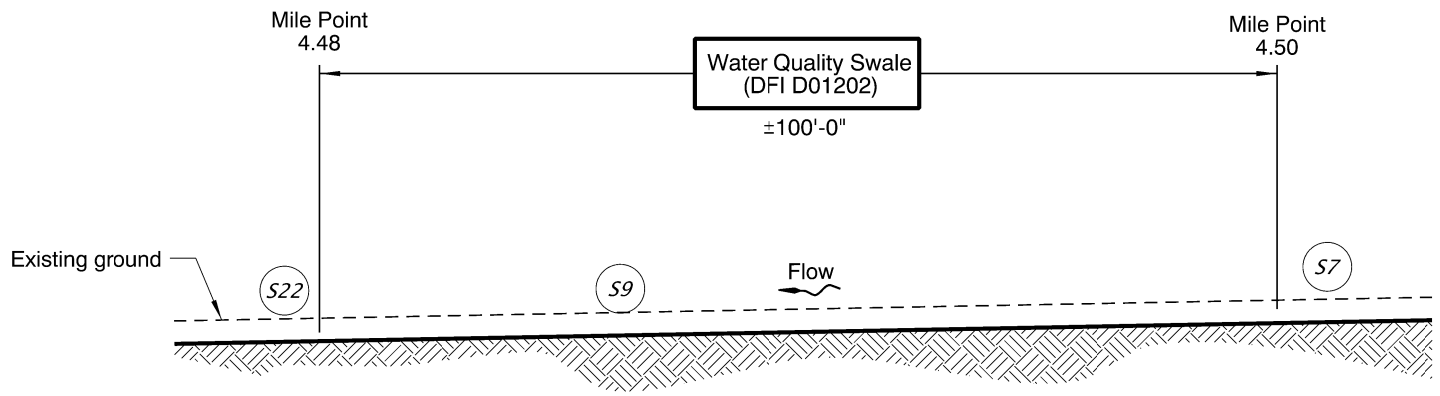
A Appendix A – Site Specific Operational Plans

Contents:

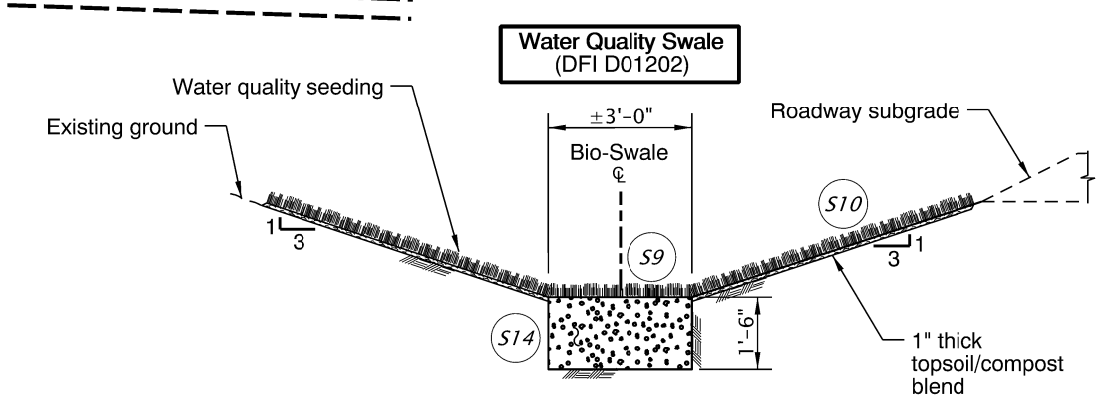
Operational Plan: DFI D01202 and D01203



PLAN
NTS



Section A-A
NTS



Section B-B
NTS

OREGON DEPARTMENT OF TRANSPORTATION

Sht. 1 of 2

Prepared By: Bruce Carmichael

Drafted By: Julie Rentz

DFI D01202
MAINTENANCE DISTRICT 3 HWY 153
WATER QUALITY BIOFILTRATION SWALE
BELLEVUE - HOPEWELL HIGHWAY MP 4.5
YAMHILL COUNTY

DFI_D01202.dgn

N

Water Quality Swale
(DFI D01202)

To Bellevue

BELLEVUE - HOPEWELL HIGHWAY (OR153)

Westbound lanes

Eastbound lanes

To Amity

Mile Point
4.48

Mile Point
4.50

Water Quality Swale
(DFI D01203)

±100'-0"

A

B

Flow

S22

S7

S9

S10

S14

PLAN
NTS

Existing ground

Section A-A
NTS

Water quality seeding

Existing ground

±3' 0"

Bio-Swale

℄

Roadway subgrade

1
3

1
3

1'-6"

1" thick
topsoil/compost
blend

Section B-B
NTS

LEGEND:

- *X#* — *Facility Component (see table 1 in O&M Manual)*
- *Manhole*
- *Inlet*
- *Storm Pipe (Facility)*
- *Storm Pipe*
- *Conveyance Direction*
- *Pavement / Facility Flow Path*
- *Traffic Flow Direction*

OREGON DEPARTMENT OF TRANSPORTATION

Sht. 2 of 2

Prepared By: Bruce Carmichael

Drafted By: Julie Rentz

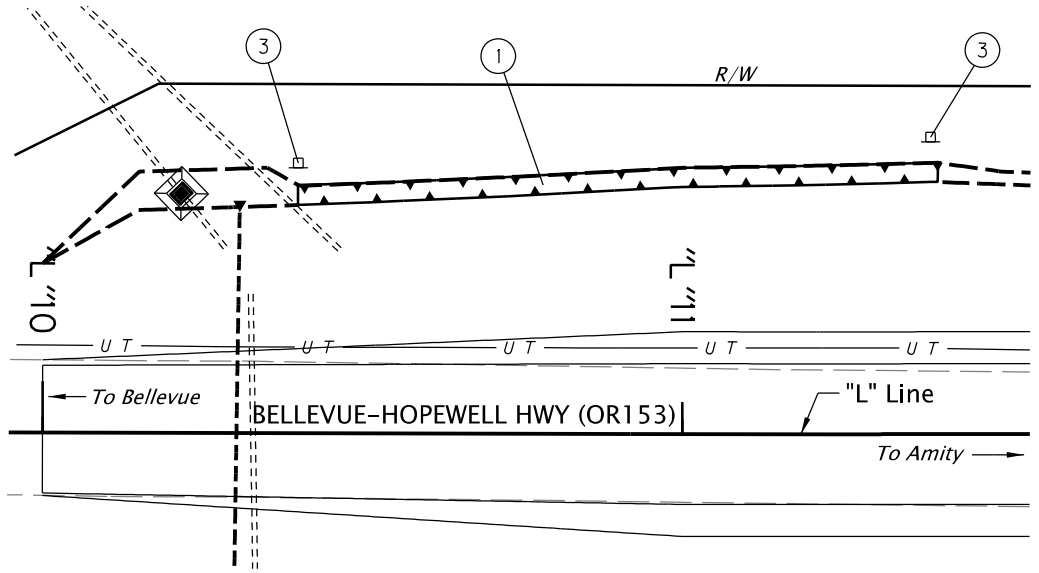
DFI D01202
MAINTENANCE DISTRICT 3 HWY 153
WATER QUALITY BIOFILTRATION SWALE
BELLEVUE - HOPEWELL HIGHWAY MP 4.5
YAMHILL COUNTY

DFI_D01203.dgn

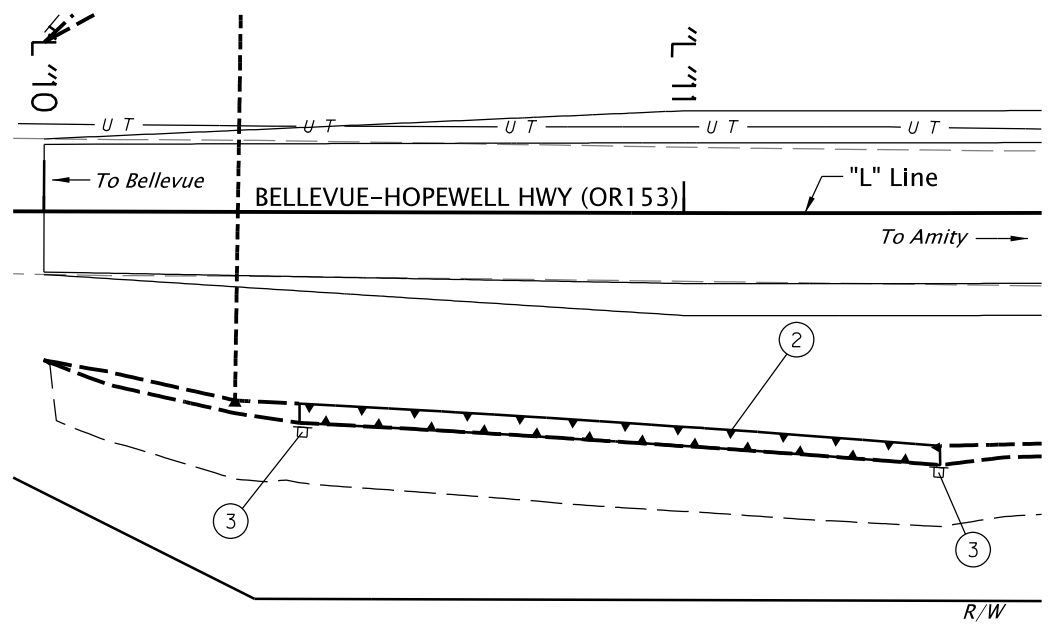
B Appendix B – Project Contract Plans

Contents:

Site Specific Subset of Project Contract Plan 52V-019

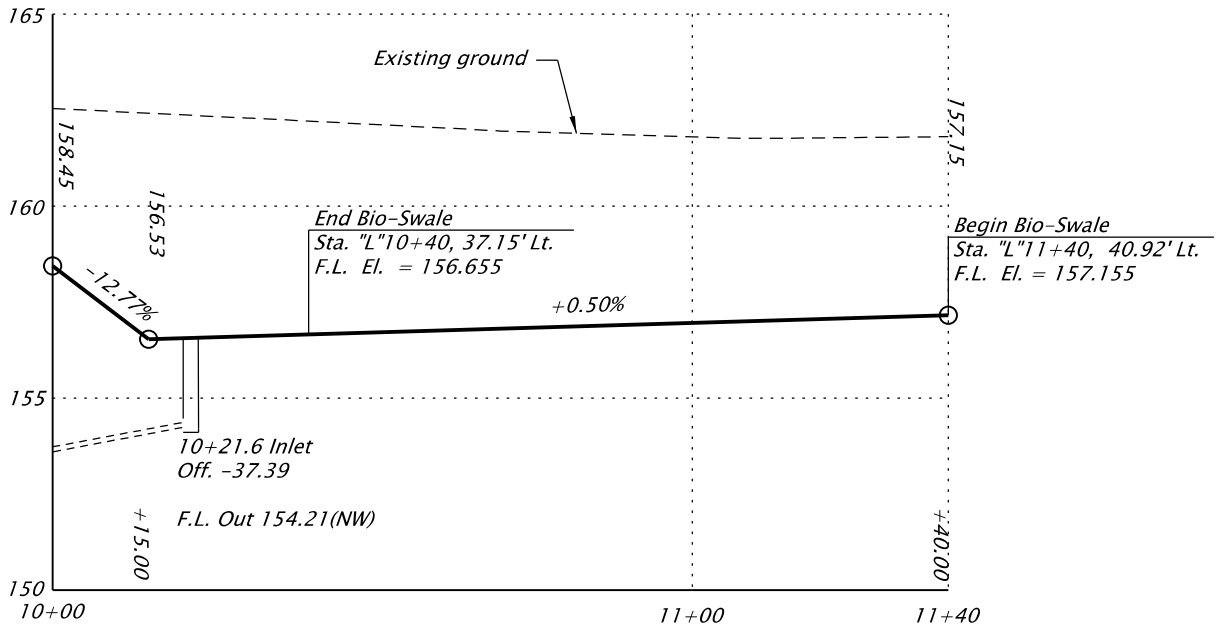


PLAN

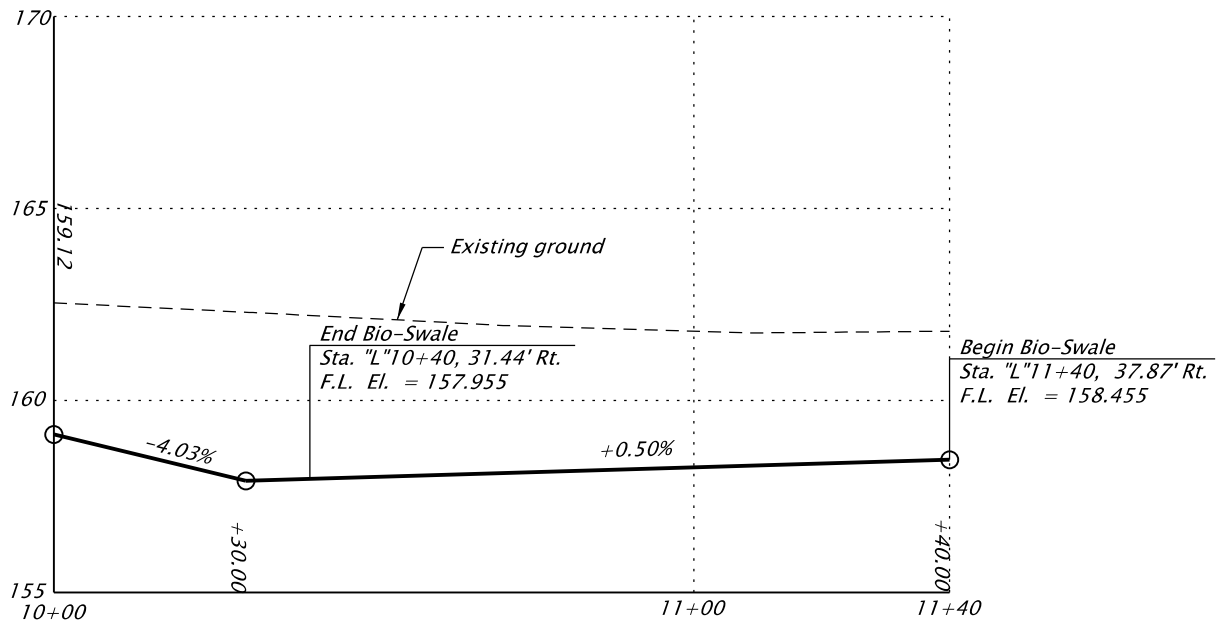


PLAN

1. *Sta. "L"10+40, 37.15' Lt. to "L"11+40, 40.92' Lt.*
   Const. Water Quality Biofiltration Swale
   (DFI No. D01202)
   Water Quality Mix - 21 cu. yd.
   (For details see sht. HA02)
2. *Sta. "L"10+40, 31.44' Rt. to "L"11+40, 37.87' Rt.*
   Const. Water Quality Biofiltration Swale
   (DFI No. D01203)
   Water Quality Mix - 21 cu. yd.
   (For details see sht. HA02)
3. *Install Type S2 markers*
   (For details see sht. RD399)



LEFT DITCH LINE PROFILE



RIGHT DITCH LINE PROFILE

HWY: 153	
M.P.: 448.0 - 458.0	
County	Yamhill
DFI/TSSU NO.	D01202 & D01203

REGISTERED PROFESSIONAL ENGINEER
65
JANUARY 23, 2001
BRUCE A. CARMICHAEL
FINAL REVIEW PLANS
RENEWS: 12-31-2019

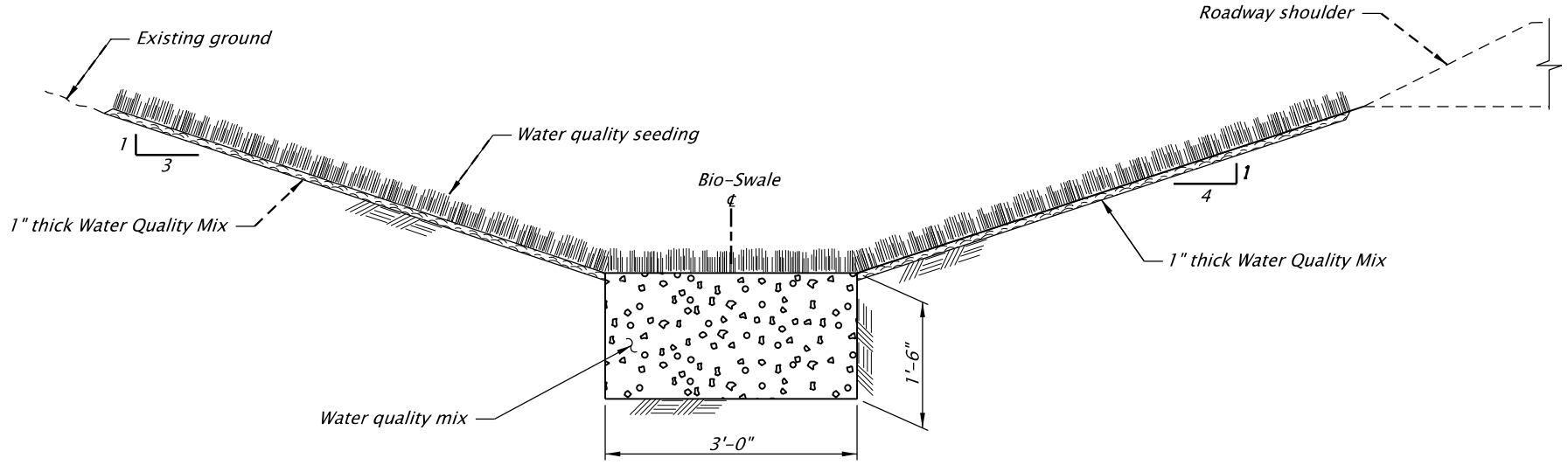
FINAL ELECTRONIC DOCUMENT AVAILABLE UPON REQUEST

OREGON DEPARTMENT OF TRANSPORTATION

OR153: BELLEVUE - HOPEWELL HWY. RAIL XING SAFETY PROJECT (PHASE 2) (RX1182) SEC.
BELLEVUE - HOPEWELL HIGHWAY
YAMHILL COUNTY

Designer: Bruce Carmichael	Reviewer: Name
Drafter: Julie Rentz	Checker: N/A

STORMWATER PLAN — SHEET NO. HA01



TYPICAL SECTION

HWY: 153
M.P.: 448.0 - 458.0

County
Yamhill

DFI/TSSU NO.
D01202 &
D01203

REGISTERED PROFESSIONAL ENGINEER
65
JANUARY 23, 2001
BRUCE A. CARMICHAEL
FINAL REVIEW PLANS
RENEWS: 12-31-2019

FINAL ELECTRONIC DOCUMENT
AVAILABLE UPON REQUEST

OREGON DEPARTMENT
OF TRANSPORTATION

OR153: BELLEVUE - HOPEWELL HWY. RAIL XING SAFETY PROJECT (PHASE 2) (RX1182) SEC.
BELLEVUE - HOPEWELL HIGHWAY
YAMHILL COUNTY

Designer: Bruce Carmichael | Reviewer: Name
Drafter: Julie Rentz | Checker: N/A

STORMWATER DETAILS

SHEET NO.
HA02

HWY198883_std_102 Default 10/10/2013 10:25:00 AM hwye78e
hwye78e
Rotation: 0° Scale: Full Size 1:1