OPERATION & MAINTENANCE MANUAL

Water Quality Biofiltration Swale

Manual prepared: August 2022

DFI No. D01499

Figure 1: DFI No. D01499, looking [note cardinal direction]

Identification

Drainage Facility ID (DFI):	D01499
Facility Type:	Water Quality Biofiltration Swale
Construction Drawings:	(V-File Numbers) xxV-xxx
Location:	District: 3
	Highway No.: 91
	Mile Post: 60.04 to 60.04, [Rt.]

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 shoulder

Flow direction: West

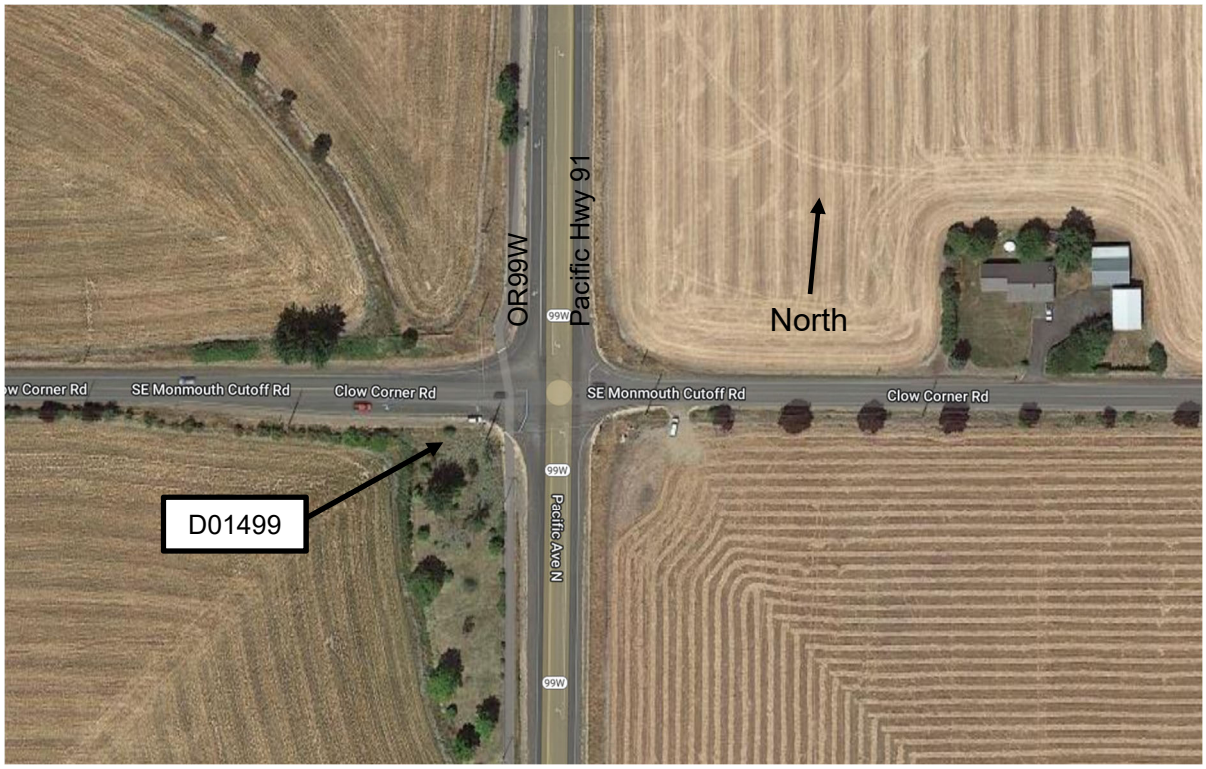


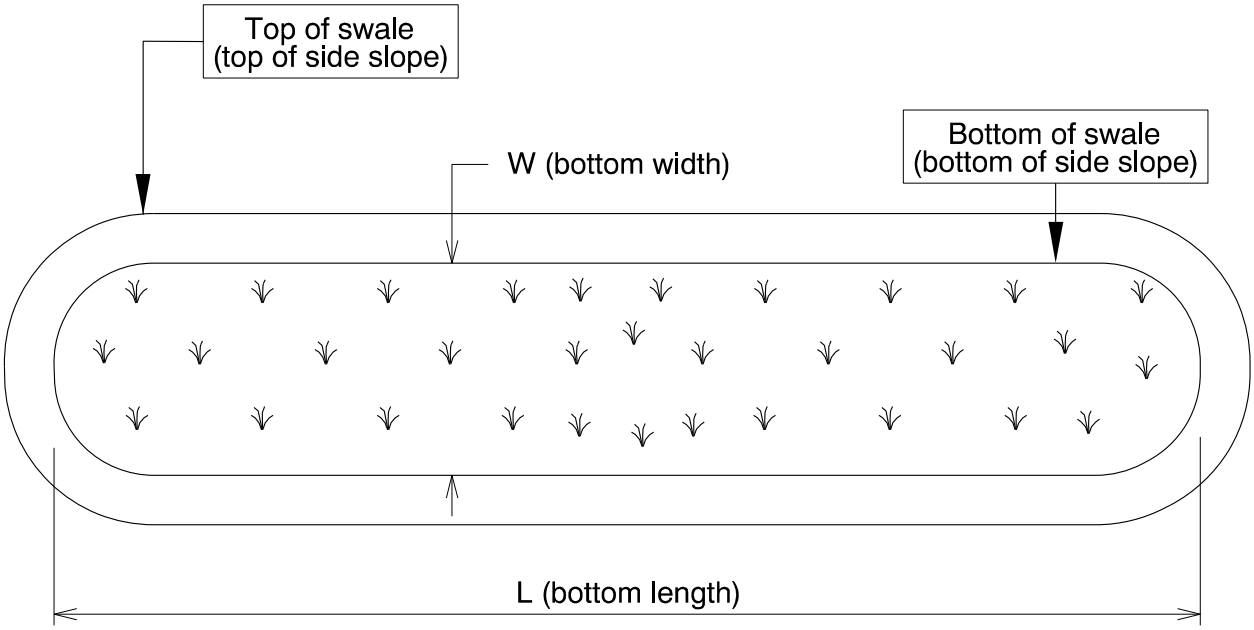
Figure 2: Facility location map

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:

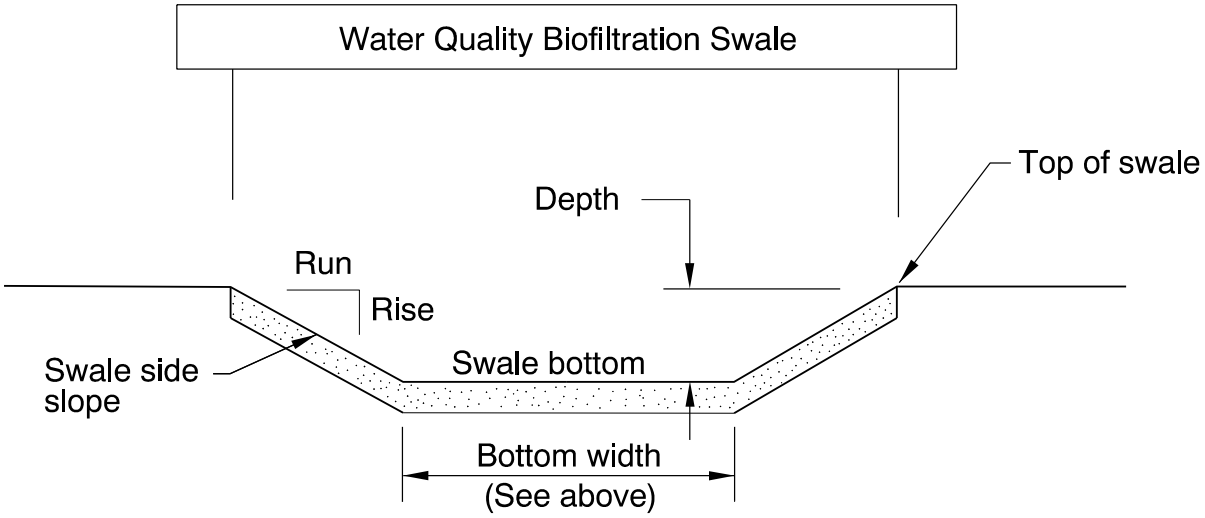
Bottom Length (feet)	Bottom Width (feet)
108	4



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	4



Site Specific Information:

The project consist of a roundabout at the intersection of OR99W and Clow Corner Rd with multiple roadside ditches and biofiltration swales.

4. Facility Access

Maintenance access to the facility:

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

Figure 3: [insert post construction facility access photo and caption text]

5. 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
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 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: Riprap Flow Spreader	☒	**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**

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

7. 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.

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

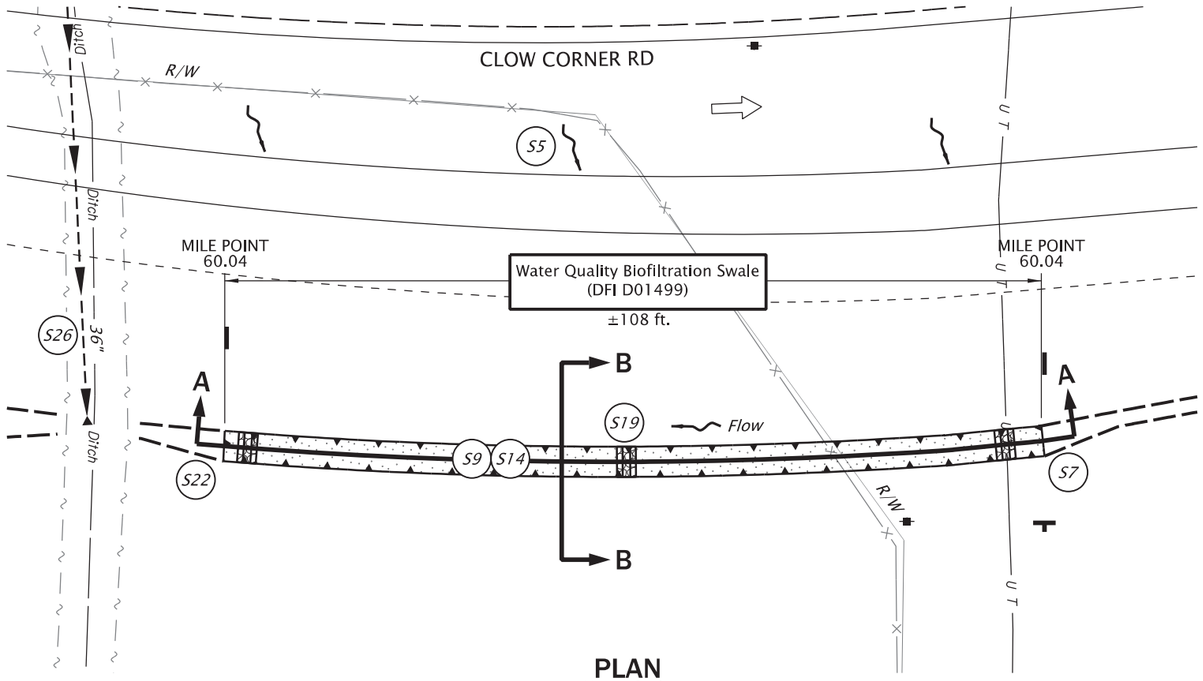
Contact any of the following for more detailed information about management of waste materials found on site:

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

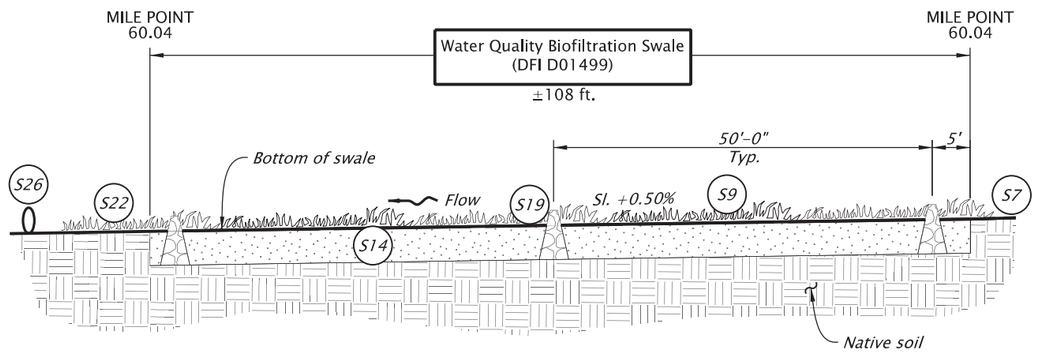
A Appendix A – Site Specific Operational Plan

Contents:

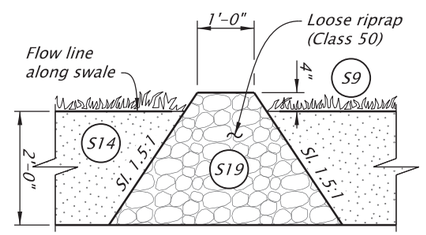
Operational Plan: DFI D01499



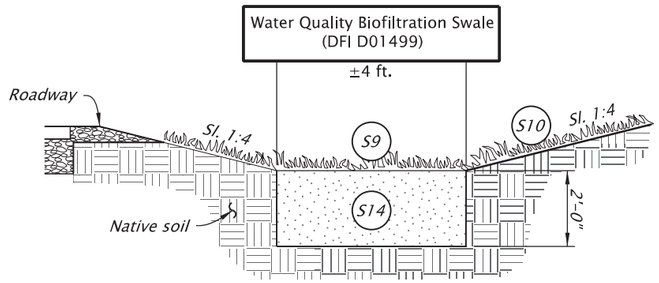
PLAN
Not to Scale



SECTION A-A
Not to Scale



RIPRAP FLOW SPREADER DETAIL
Not to Scale



SECTION B-B
Not to Scale

LEGEND

- S# — Facility component (see table 1 in O&M Manual)
- Water Quality Biofiltration Swale Boundary
- Ditch bottom
- Storm pipe (facility)
- Pavement / facility flow path
- Traffic flow direction
- Type 1 Field Marker
- Type 2 Field Marker

OREGON DEPARTMENT OF TRANSPORTATION

Sht. 11 of 12

Prepared By: Ramiro Perez

Drafted By: Jeff Coon

DFI D01499
MAINTENANCE DISTRICT 3 HWY OR99W
WATER QUALITY BIOFILTRATION SWALE
HIGHWAY MP 60.04
POLK COUNTY

B Appendix B – Project Contract Plans

Contents:

Site Specific Subset of Project Contract Plan xxV-xxx

56V-014

INDEX OF SHEETS	
SHEET NO.	DESCRIPTION
A01	Title Sheet
A02, A03	Index Of Sheets Cont. & Std. Dwg. Nos.

STATE OF OREGON

DEPARTMENT OF TRANSPORTATION

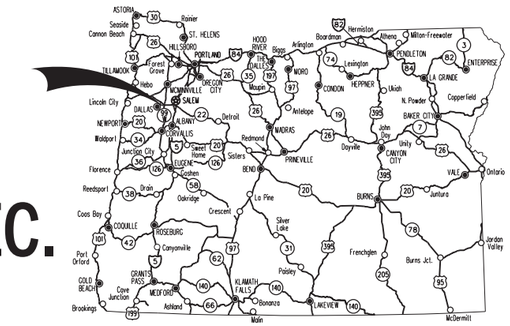
PLANS FOR PROPOSED PROJECT

GRADING, DRAINAGE, PAVING, CURB RAMPS, SIGNING, ILLUMINATION & ROADSIDE DEVELOPMENT

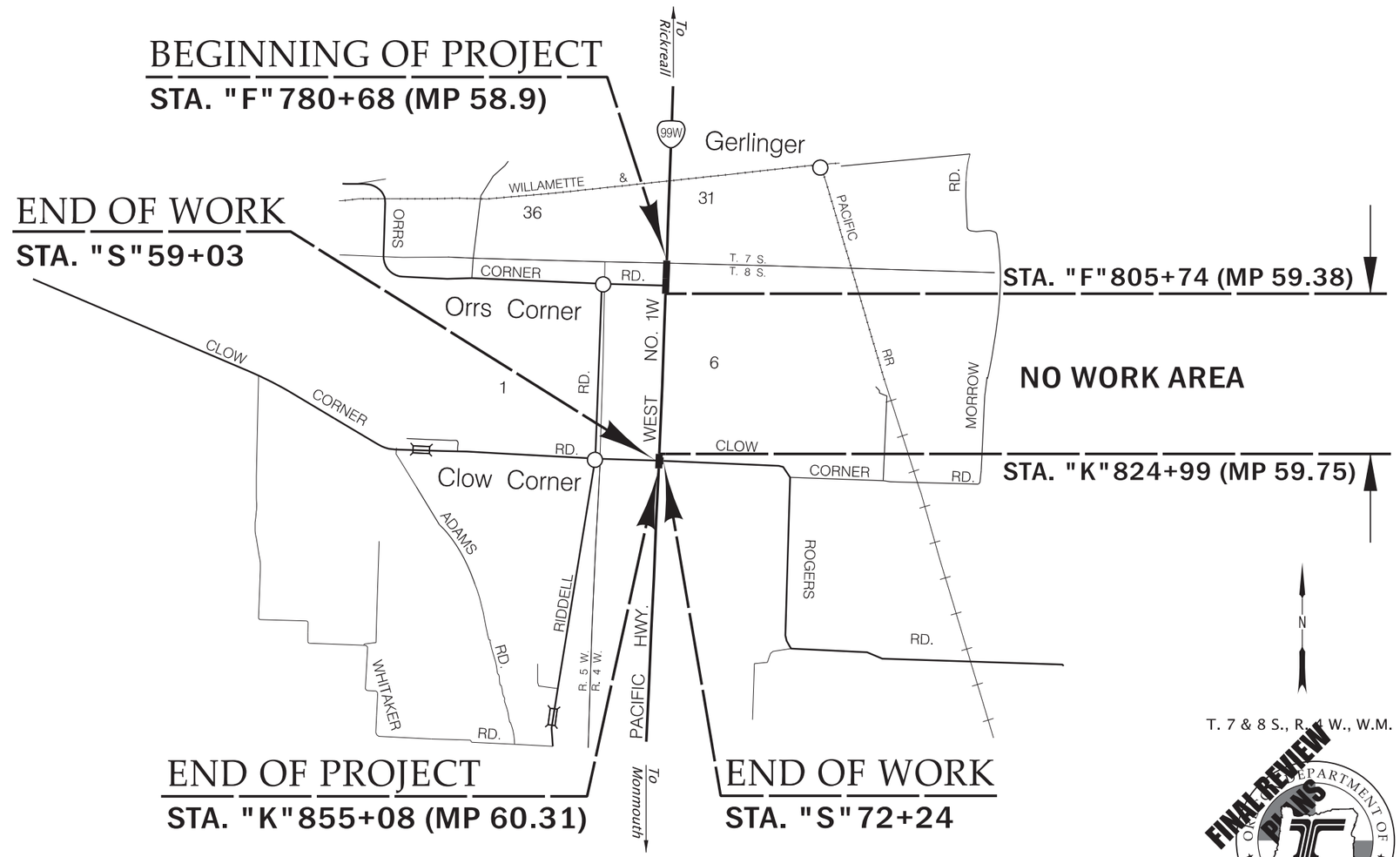
OR99W: ORRS CORNER RD. - CLOW CORNER RD. SEC.

PACIFIC HIGHWAY WEST

POLK COUNTY
MARCH 2023



Overall Length Of Project - 1.04 Miles



ATTENTION:
Oregon Law Requires You To Follow Rules Adopted By The Oregon Utility Notification Center. Those Rules Are Set Forth In OAR 952-001-0001 Through OAR 952-001-0090. You May Obtain Copies Of The Rules By Calling The Center (Note: The Telephone Number For The Oregon Utility Notification Center Is (503) 232-1987).

LET'S ALL WORK TOGETHER TO MAKE THIS JOB SAFE

OREGON TRANSPORTATION COMMISSION

Robert Van Brocklin	CHAIR
Alando Simpson	COMMISSIONER
Julie Brown	COMMISSIONER
Sharon Smith	COMMISSIONER
Marcilynn Burke	COMMISSIONER
Kristopher W. Strickler	DIRECTOR OF TRANSPORTATION

These plans were developed using ODOT design standards. Exceptions to these standards, if any, have been submitted and approved by the ODOT Chief Engineer or their delegated authority.

Approving Authority: _____
Signature & date

Carol Cartwright-R2 Tech Center Manager
Print name and title

_____
Concurrence by ODOT Chief Engineer

FINAL REVIEW PLANS

OR99W: ORRS CORNER RD. - CLOW CORNER RD. SEC.
PACIFIC HIGHWAY WEST
POLK COUNTY

FEDERAL HIGHWAY ADMINISTRATION	PROJECT NUMBER	SHEET NO.
OREGON DIVISION	S091(097)	A01

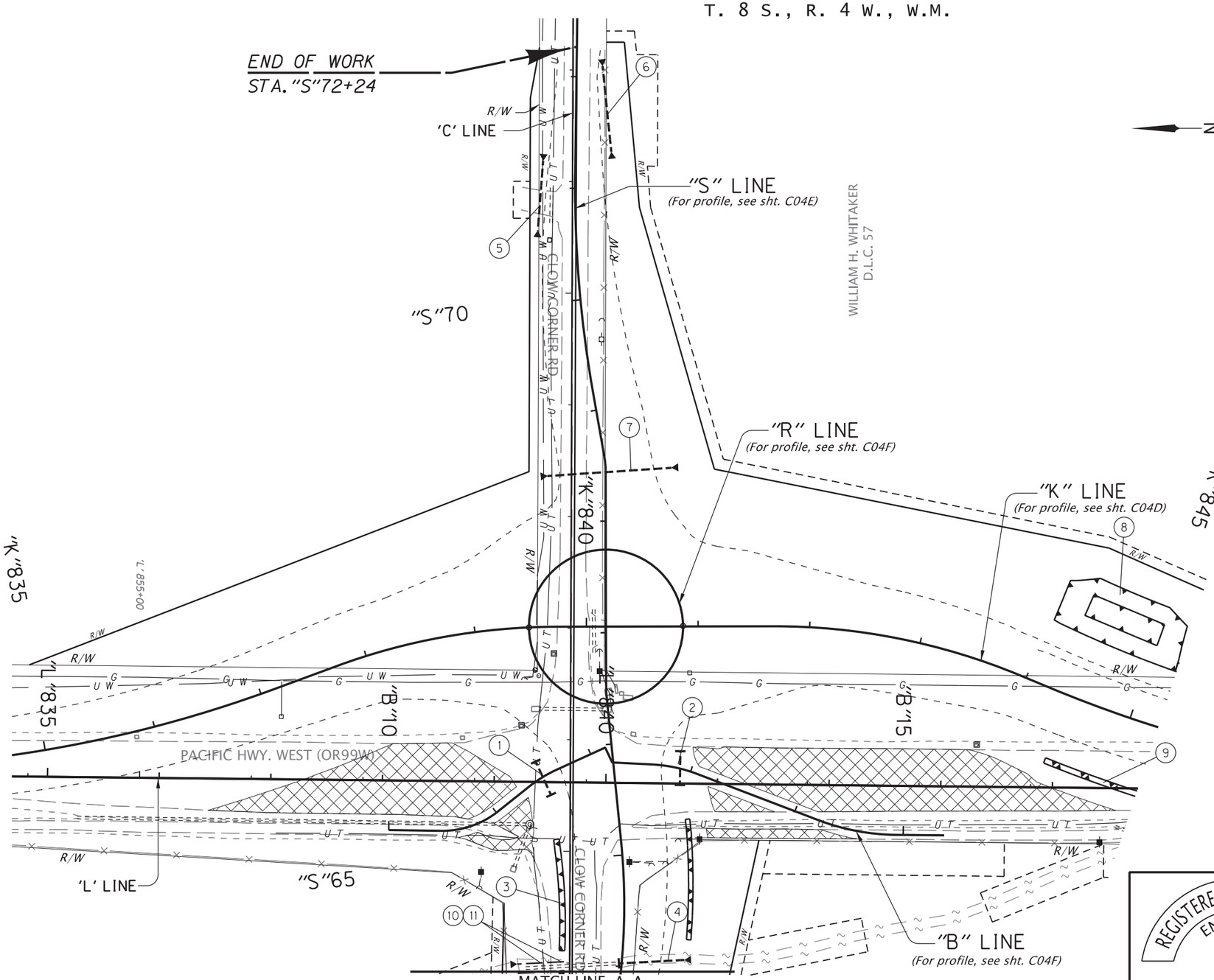
PE003055 000

R_K21374_ts_01.dgn :: Default 9/27/2022 10:00:20 AM tdb081

FINAL ELECTRONIC DOCUMENT AVAILABLE UPON REQUEST

Rotation: 0° Scale: 1"=100'

T. 8 S., R. 4 W., W.M.



GENERAL CONSTRUCTION NOTE:
Regulated work area boundary is denoted by Ordinary High Water, see Special Provision 00290.34(a).

Obliterate surfacing shown thus:

DRAINAGE NOTES

1. *Inst. 18" culv. pipe - 49'*
   5' depth
2. *Inst. 18" culv. pipe - 48'*
   5' depth
3. *Sta. "S"64+10 to Sta. "S"65+20, Lt.*
   Const. water quality swale
   No. D01479
   (For sht. nos., see sht. A02, Hydraulic)
4. *Sta. "S"64+02.7*
   Extend - 36" culv. 59' Rt., 5' depth
   Const. paved end slope, Rt. - 67 sq.ft.
5. *Inst. 18" culv. pipe - 62'*
   5' depth
   Const. paved end slope, Lt. & Rt. - 70 sq.ft.
6. *Inst. 18" culv. pipe - 77'*
   5' depth
   Const. paved end slope, Lt. & Rt. - 70 sq.ft.
7. *Inst. 24" culv. pipe - 112'*
   5' depth
   Const. paved end slope, Lt. & Rt. - 88 sq.ft.
8. *Sta. "K"844+00 to Sta. "K"845+26, Lt.*
   Const. water quality storage pond
   No. D01481
   (For sht. nos., see sht. A02, Hydraulic)
9. *Sta. "K"844+43 to Sta. "K"845+43, Rt.*
   Const. water quality swale
   No. D01474
   (For sht. nos., see sht. A02, Hydraulic)
10. *Sta. "S"63+95, Lt.*
    Remove 36" CP culv. pipe - 34' (In pl.)
    Sawcut pipe end to match embankment slope
    Const. paved end slope, Lt. - 67 sq.ft.
11. *Const. ditch*
    8' flat bottom, 1:3 slopes
    Dt. exc. - 60 cu.yd.
    (For details, see sht. BB02)

REGISTERED PROFESSIONAL ENGINEER
58...
OREGON
JULY 13, 2004
DERRYL D. JAMES
FINAL REVIEW PLANS
RENEWS: 06-30-2023

FINAL ELECTRONIC DOCUMENT AVAILABLE UPON REQUEST

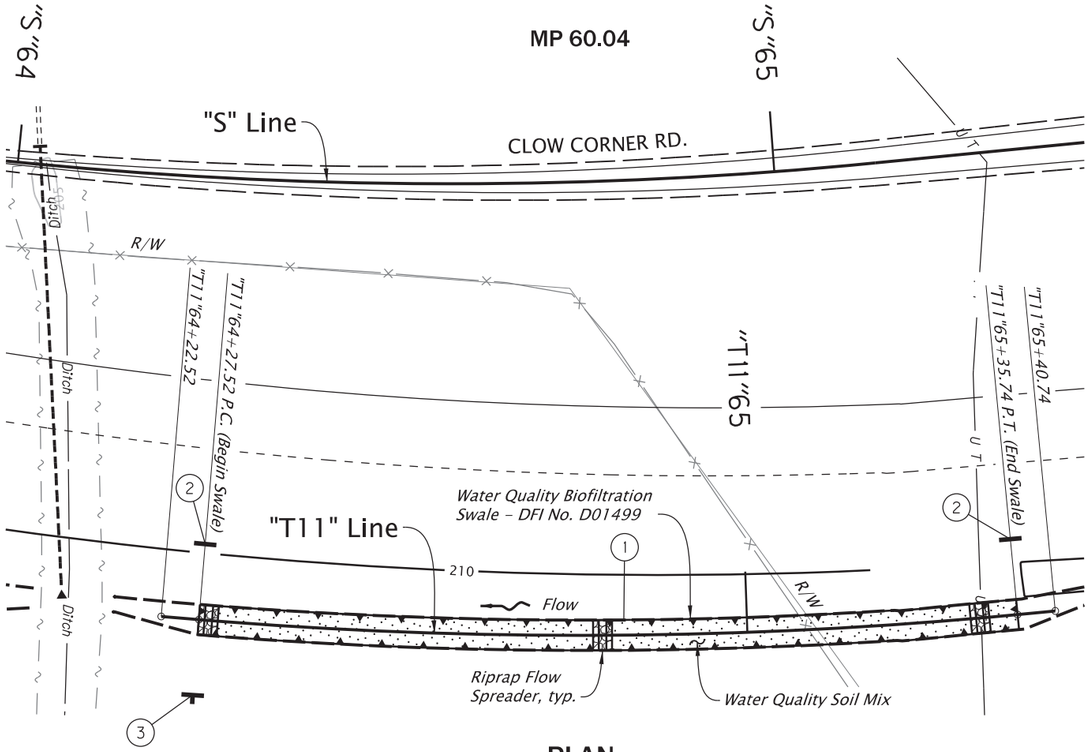
OREGON DEPARTMENT OF TRANSPORTATION

OR99W: ORRS CORNER RD. - CLOW CORNER RD. SEC.
PACIFIC HIGHWAY WEST
POLK COUNTY

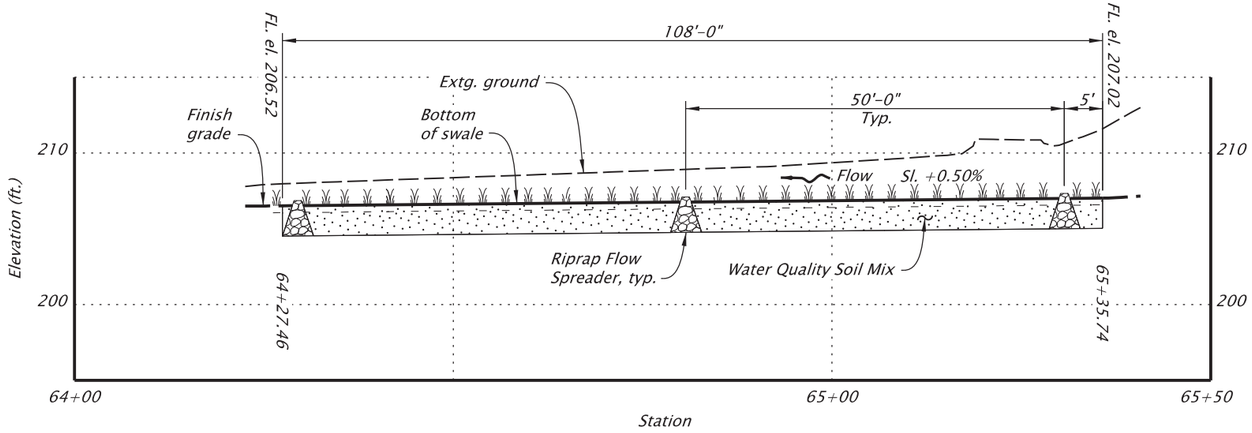
Designer: Derryl James | Reviewer: Eliseo Lemus
Drafter: Charlotte Gerken | Checker: N/A

DRAINAGE & UTILITIES

SHEET NO. C04C



PLAN
Scale: 1"=20'



PROFILE "T11" LINE
Horz. Scale: 1"=20'
Vert. Scale: 1"=10'

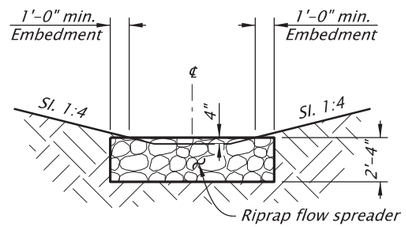
NOTE:
Elevations shown are based on
North American Vertical Datum 1988 (NAVD88).

FACILITY ID MARKER TABLE						
Facility Location		DFI Number	Type S2 Marker		Type S1 Marker	
Station	Offset		Begin	End	Red	Green
"T11" 64+27	10' Rt.	D01499	✓			
"T11" 64+27	10' Lt.	D01499			✓	
"T11" 65+35	10' Lt.	D01499				✓

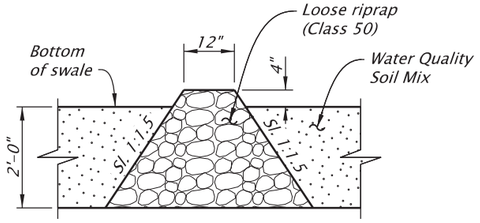
✓ *Check where appropriate*
Red = Beginning of facility
Green = End of facility

CONSTRUCTION NOTES

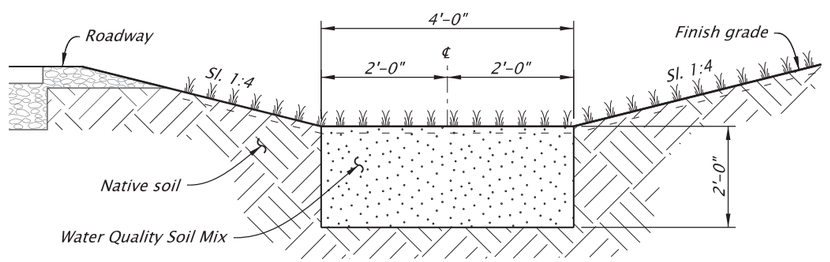
1. *Sta. "T11" 64+27 to Sta. "T11" 65+35*
   Const. Water Quality Biofiltration Swale -
   DFI no. D01499
   Water Quality Soil Mix - 35 cu. yd.
   Riprap Flow Spreader (Class 50) - 8 cu. yd.
2. *Inst. Type S1 marker*
   (See dwg. RD399)
3. *Inst. Type S2 marker*
   (See dwg. RD399)



RIPRAP FLOW SPREADER TYPICAL SECTION
Not to Scale



RIPRAP FLOW SPREADER DETAIL
Not to Scale



TYPICAL SECTION
Not to Scale

Note:
For all swale excavation quantities, (See sht. A02 for Profile sheets)

REGISTERED PROFESSIONAL ENGINEER
94...
OREGON
MAY 14, 2019
RAMIRO PEREZ
FINAL REVIEW PLANS
RENEWS: 12-31-2022
FINAL ELECTRONIC DOCUMENT AVAILABLE UPON REQUEST

OREGON DEPARTMENT OF TRANSPORTATION

OR99W: ORRS CORNER RD. - CLOW CORNER RD. SEC.
PACIFIC HIGHWAY WEST
POLK COUNTY

HWY: 091	Designer: Ramiro Perez
M.P.: 60.04	Reviewer: Jason Stroud
UNIT FILE CODE: N/A	Drafter: Jeff Coon
DFI/TSSU NO.: D01499	Checker: N/A

STORMWATER — SHEET NO. HA103