

OPERATION & MAINTENANCE MANUAL

Water Quality Filter Strip

Manual prepared: May 2022

DFI Nos. D01488-D01493



Figure 1: DFI No. D01488 looking North

1. Identification

Drainage Facility ID (DFI): D01488-D01493
Facility Type: Water Quality Filter Strip
Construction Drawings: (V-File Numbers) 55V-067
Location: District: 14
Highway No.: 455
Mile Post: 31.460 to 31.550, Left

Drainage Facility ID (DFI): D01489
Facility Type: Water Quality Filter Strip
Construction Drawings: (V-File Numbers) 55V-067
Location: District: 14
Highway No.: 455
Mile Post: 31.560 to 31.670, Left

Drainage Facility ID (DFI): D01490
Facility Type: Water Quality Filter Strip
Construction Drawings: (V-File Numbers) 55V-067
Location: District: 14
Highway No.: 455
Mile Post: 31.690 to 31.750, Left

Drainage Facility ID (DFI): D01491
Facility Type: Water Quality Filter Strip
Construction Drawings: (V-File Numbers) 55V-067
Location: District: 14
Highway No.: 007
Mile Post: 258.190 to 258.200, Left

Drainage Facility ID (DFI): D01492
Facility Type: Water Quality Filter Strip
Construction Drawings: (V-File Numbers) 55V-067
Location: District: 14
Highway No.: 007
Mile Post: 258.200 to 258.220, Left

Drainage Facility ID (DFI): D01493
Facility Type: Water Quality Filter Strip
Construction Drawings: (V-File Numbers) 55V-067
Location: District: 14
Highway No.: 007
Mile Post: 258.230 to 258.240, Left

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, and access location are noted on the map. Stormwater flow directions can be seen in Appendix A. **NOTE: Mile posts are based off of the V-File, and may vary from TransGIS mile posts.**

Facility location type: **Roadway shoulder**

Flow direction: Stormwater flows across filter strip approximately west to east.

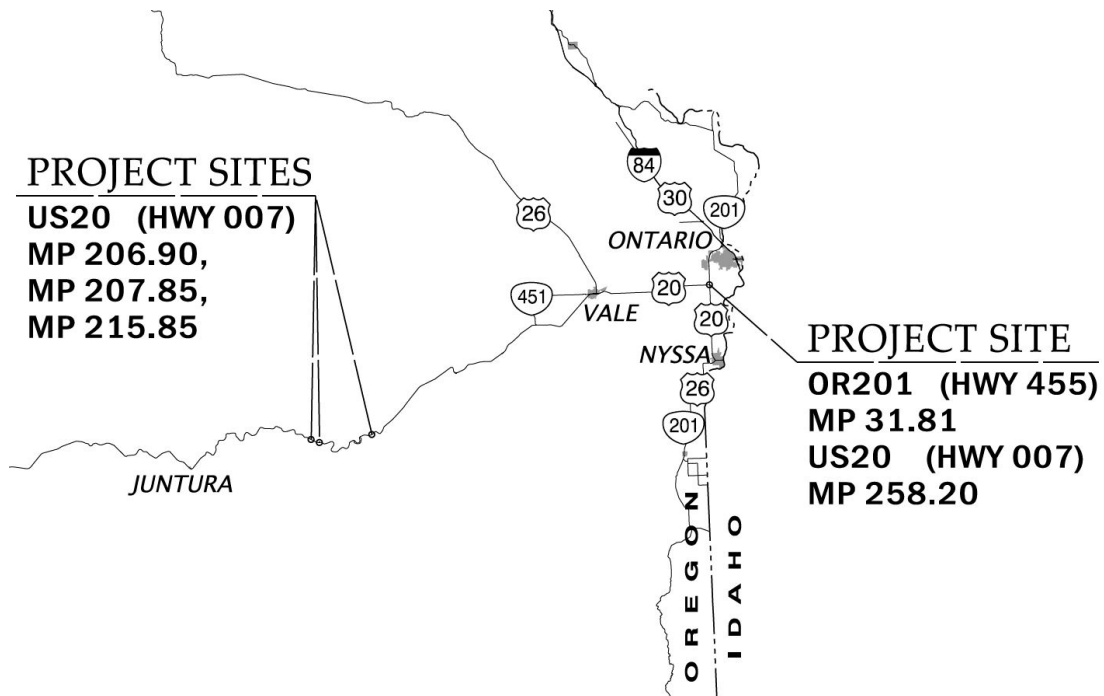


Figure 2: Vicinity Map

4. Facility Summary

The width is measured perpendicular to the edge of pavement and is equivalent to the flow length. The length is measured parallel to the edge of pavement and is equivalent to the length of the contributing impervious area.

The length and width of the applicable facility components are:

Facility DFI	Length (feet)	Width (feet)
D01488	455	8
D01489	595	8
D01490	285	8
D01491	90	8
D01492	162	6
D01493	48	6

The slope of the facility is presented by a vertical distance (rise) followed by the horizontal distance (run).

Facility DFI	Rise (feet)	Run (feet)
D01488-D01493	1	50

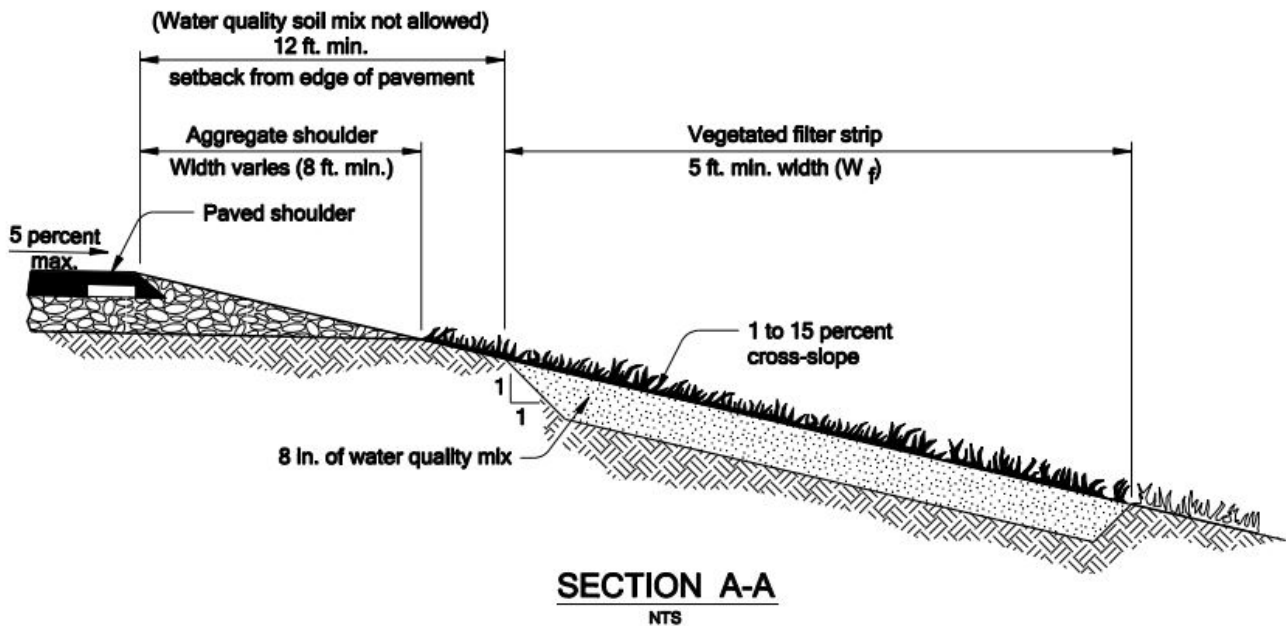


Figure 3: Filter Strip Section

Site Specific Information:

Due to the semi-arid environment and because the soils support infiltration, aggregate media was used instead of vegetation as the top layer of the filter strip and ecology mix was substituted for water quality mix. Additionally, the ecology mix is placed in geocells to help support potential vehicle traffic due to the close proximity to the roadway.

5. Facility Access

Maintenance access to the facility:

<input type="checkbox"/> Roadside pad	<input checked="" type="checkbox"/> Roadside shoulder
<input type="checkbox"/> Access road with Gate	<input type="checkbox"/> Access road without Gate

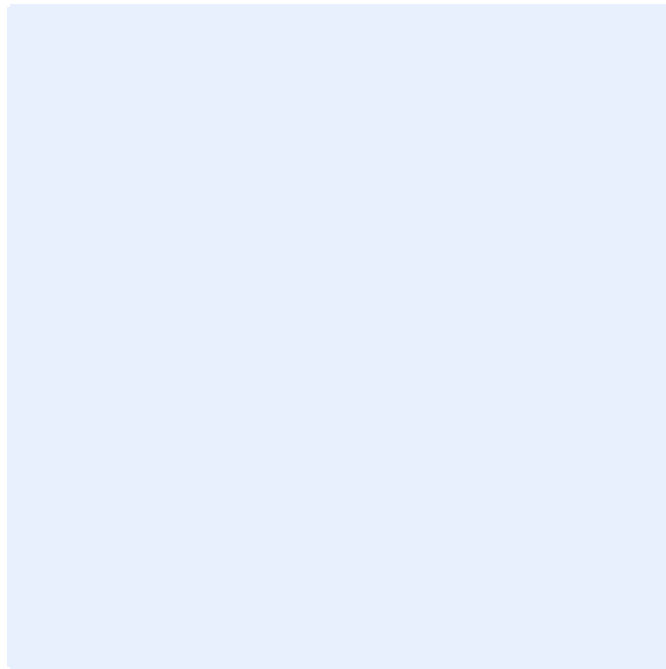


Figure 3: [insert post construction facility access photo and caption text]

6. Operational Components / Maintenance Items

Classification and Standard Operational (Op) Plan:

This facility is classified as a:

<p style="text-align: center;"><input checked="" type="checkbox"/> Filter Strip (Op Plan A)</p> <p>A filter strip consists of a vegetated or media slope located parallel to the edge of pavement. It maintains sheet flow of stormwater runoff over the width of the strip.</p>	<p style="text-align: center;"><input type="checkbox"/> Bioslope (Op Plan B)</p> <p>A bioslope consists of a filter strip and treatment zone. It is a flow-through stormwater treatment facility located along roadside embankments.</p>
<p>A standard operational plan illustrates the general facility footprint configuration and explains the purpose of each facility component. Operational plans (A, B) are provided in the Standard Operation Manual.</p>	

See Appendix A for the site specific operational plan.

Operational Components

Filter strips and bioslopes have many components that assist with treatment, conveyance, and infiltration of stormwater runoff. The components in use can vary depending on the facility design. 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 Filter Strips and Bioslopes (implemented December of 2018) 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/>

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: Bioslope/Filter Strip Components		ID #
Facility Inlet		
Pavement Sheet Flow	<input checked="" type="checkbox"/>	B1
Shoulder Aggregate	<input checked="" type="checkbox"/>	B2
Ground Cover		
Vegetated Slope	<input type="checkbox"/>	B3
Aggregate Media Slope	<input checked="" type="checkbox"/>	B4
Underground Components		
Water Quality Mix	<input type="checkbox"/>	B5
Ecology Mix	<input checked="" type="checkbox"/>	B6
Granular Drain Backfill Material	<input type="checkbox"/>	B7
Geotextile Fabric	<input checked="" type="checkbox"/>	B8
Geocell Grid	<input checked="" type="checkbox"/>	B9
Structures		
Curb/Berm	<input type="checkbox"/>	B10
Check Dam	<input type="checkbox"/>	B11
Cleanout	<input type="checkbox"/>	B12
Facility Outlet		
Perforated Drain Pipe	<input type="checkbox"/>	B13
Open Slope Outlet	<input checked="" type="checkbox"/>	B14
Open Channel Outlet	<input type="checkbox"/>	B15
Storm Drain Outlet Pipe	<input type="checkbox"/>	B16
Outfall Type		
Waterbody (Creek/Lake/Ocean)	<input type="checkbox"/> C	B17
	<input type="checkbox"/> L	
	<input type="checkbox"/> O	
Outfall Channel	<input checked="" type="checkbox"/>	B18
Storm Drain System	<input type="checkbox"/>	B19
Outfall Components		
Pervious Berm	<input type="checkbox"/>	B20
Riprap Pad	<input type="checkbox"/>	B21

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 filter strips and bioslopes:

- Table 1 (General Maintenance): Contains general maintenance and inspection guidelines that are applicable to all ODOT water quality facilities
- Table 4 (Water Quality Filter Strips)
- Table 5 (Water Quality Bioslopes)

The ODOT Maintenance Guide can be viewed at the following website:

<http://www.oregon.gov/ODOT/HWY/OOM/pages/mguide.aspx>

The *Blue Book* can be viewed at the following website:

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

8. Limitations

Filter strips and bioslopes are NOT designed to allow the use of heavy equipment. Vehicles entering the facility 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.

9. Waste Material Handling

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

<http://www.oregon.gov/ODOT/HWY/OOM/pages/ems.aspx>

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

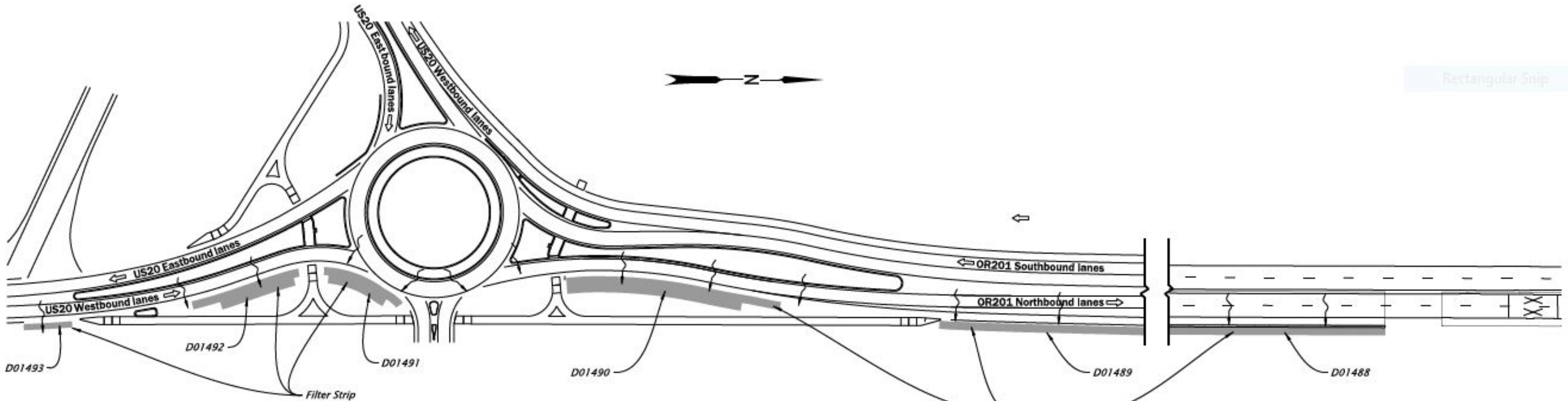
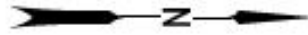
ODOT Clean Water Unit	(503) 986-3008
ODOT Statewide Hazmat Coordinator	(503) 667-7442
ODOT Region 1 Hazmat Coordinator	(503) 731-8290
ODOT Region 2 Hazmat Coordinator	(503) 986-2647
ODOT Region 3 Hazmat Coordinator	(541) 957-3594
ODOT Region 4 Hazmat Coordinator	(541) 388-6186
ODOT Region 5 Hazmat Coordinator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

A Appendix A – Site Specific Operational Plan

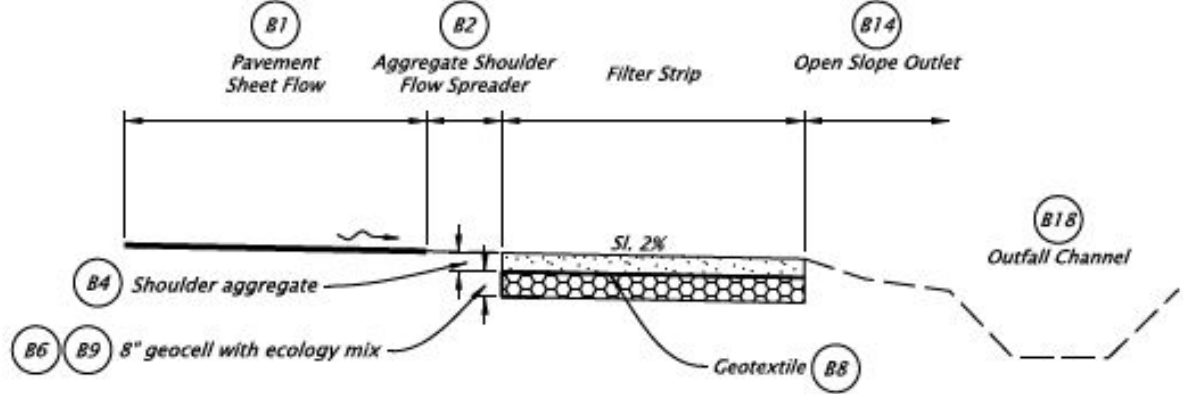
Contents:

Operational Plan: DFI D01488-D01493

Rectangular Snip



PLAN VIEW DETAIL
N.T.S.



TYPICAL SECTION
N.T.S.

- LEGEND**
- Facility component (see table 1 in O&M Manual)
 - Pavement / facility flow path
 - Traffic flow direction



Sht. 1 of 1

Prepared By:
Chris Dierl

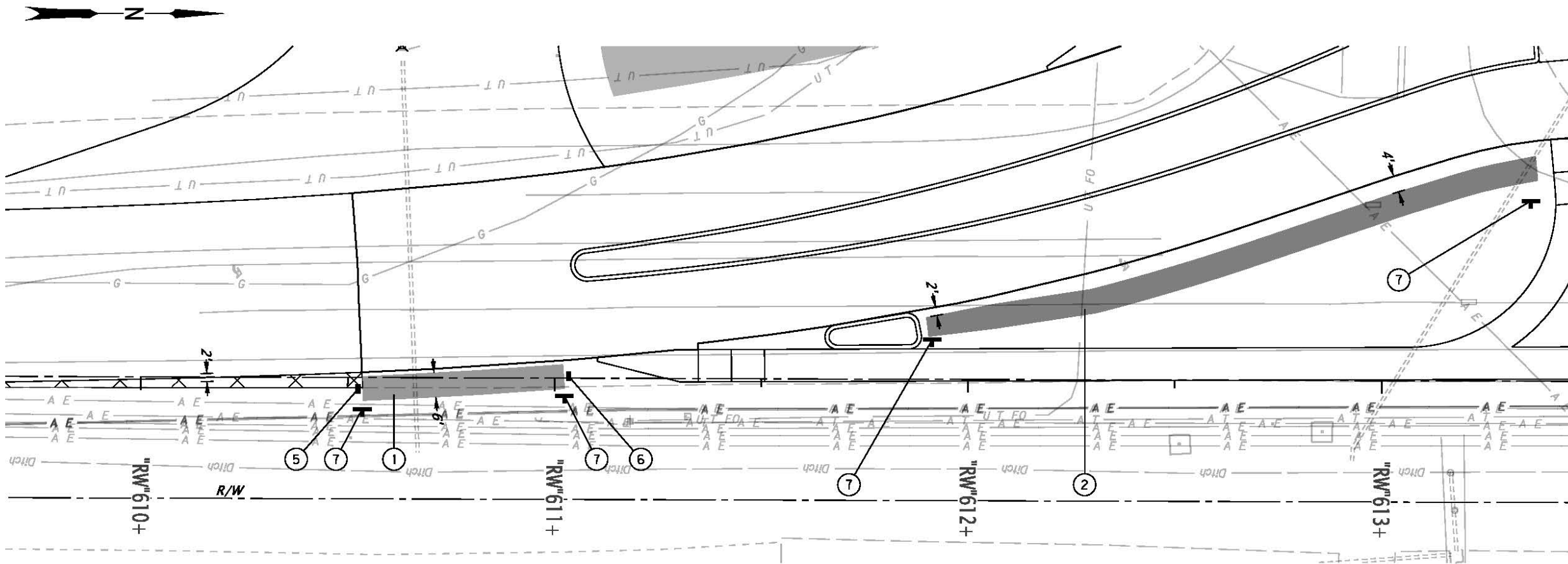
Drafted By:
Chris Dierl

DFI D01488 - D01493
MAINTENANCE DISTRICT 14 HWY 455 & 007
WATER QUALITY FILTER STRIP
 OLDS FERRY - ONTARIO HWY MP 31.46 - 31.75
 CENTRAL OREGON HWY MP 258.19 - 258.24
 MALHEUR COUNTY

B Appendix B – Project Contract Plans

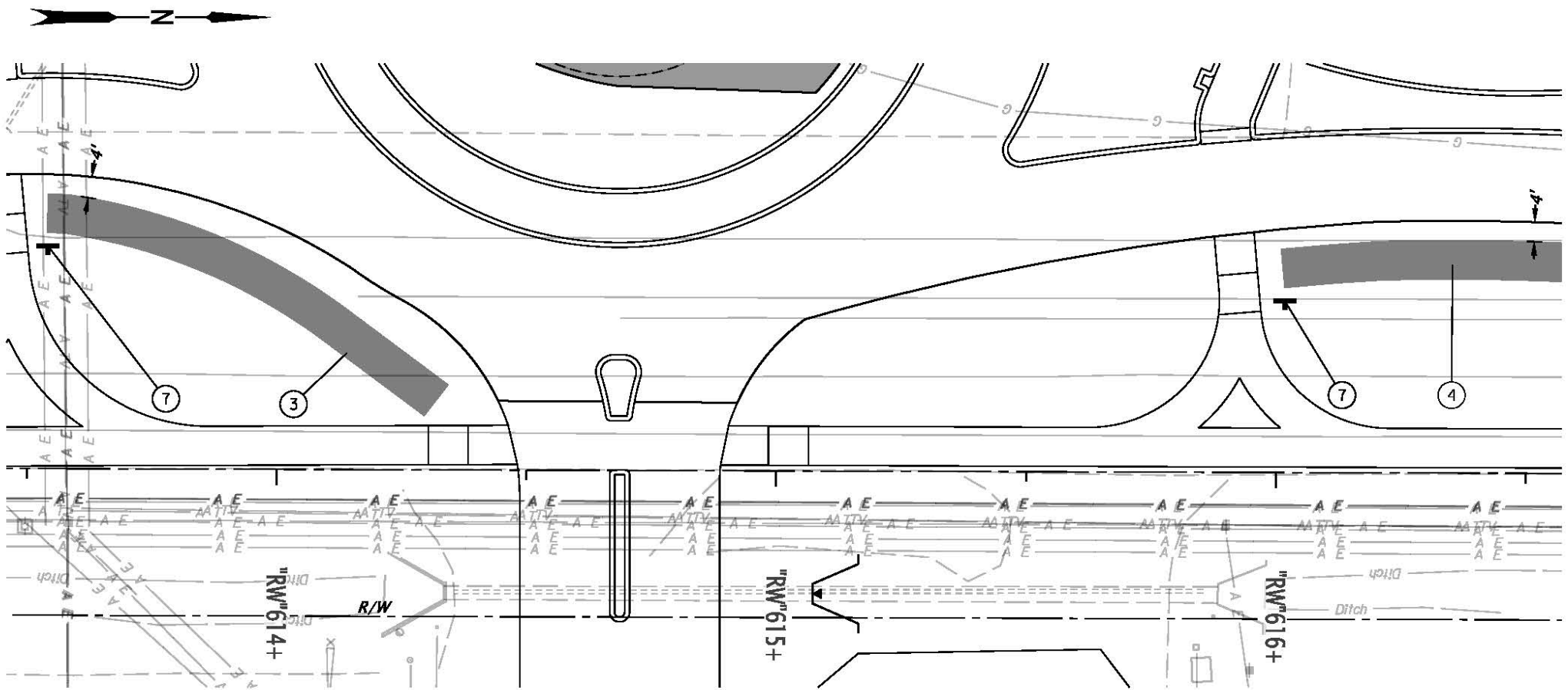
Contents:

Site Specific Subset of Project Contract Plan 55V-067



- ① Sta. "RW" 610+53.50 Rt. to Sta. "RW" 611+02.03 Rt.
Const. filter strip DFI no. D01493
(For details, see sht. HA04)
- ② Sta. "RW" 611+80.91 Lt. to Sta. "RW" 613+37.05 Lt.
Const. filter strip DFI no. D01492
- ③ Sta. "RW" 613+54.04 Lt. to Sta. "RW" 614+34.35 Lt.
Const. filter strip DFI no. D01491
- ④ Sta. "RW" 616+00.86 Lt. to Sta. "RW" 618+83.24 Lt.
Const. filter strip DFI no. D01490
- ⑤ Inst. Type S-1 marker - red
(See dwg. no. RD399)
- ⑥ Inst. Type S-1 marker - green
- ⑦ Inst. Type S-2 marker
(See dwg. no. RD399)

NOTE:
Maintain 2ft separation between filter strips and utility poles. For details, see sht. HA04.



FACILITY ID MARKER TABLE						
Facility Location		DFI Number	Type S2 Marker		Type S1 Marker	
Station	MP		Begin	End	Red	Green
"RW" 610+53.50 Rt.	258.26	D01493	✓		✓	
"RW" 611+02.03 Rt.	258.23	D01493		✓		✓
"RW" 611+80.91 Lt.	258.22	D01492	✓			
"RW" 613+37.05 Lt.	258.20	D01492		✓		
"RW" 613+54.04 Lt.	31.80	D01491	✓			
"RW" 616+00.86 Lt.	31.75	D01490	✓			

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

FINAL REVIEW PLANS

OREGON DEPARTMENT OF TRANSPORTATION

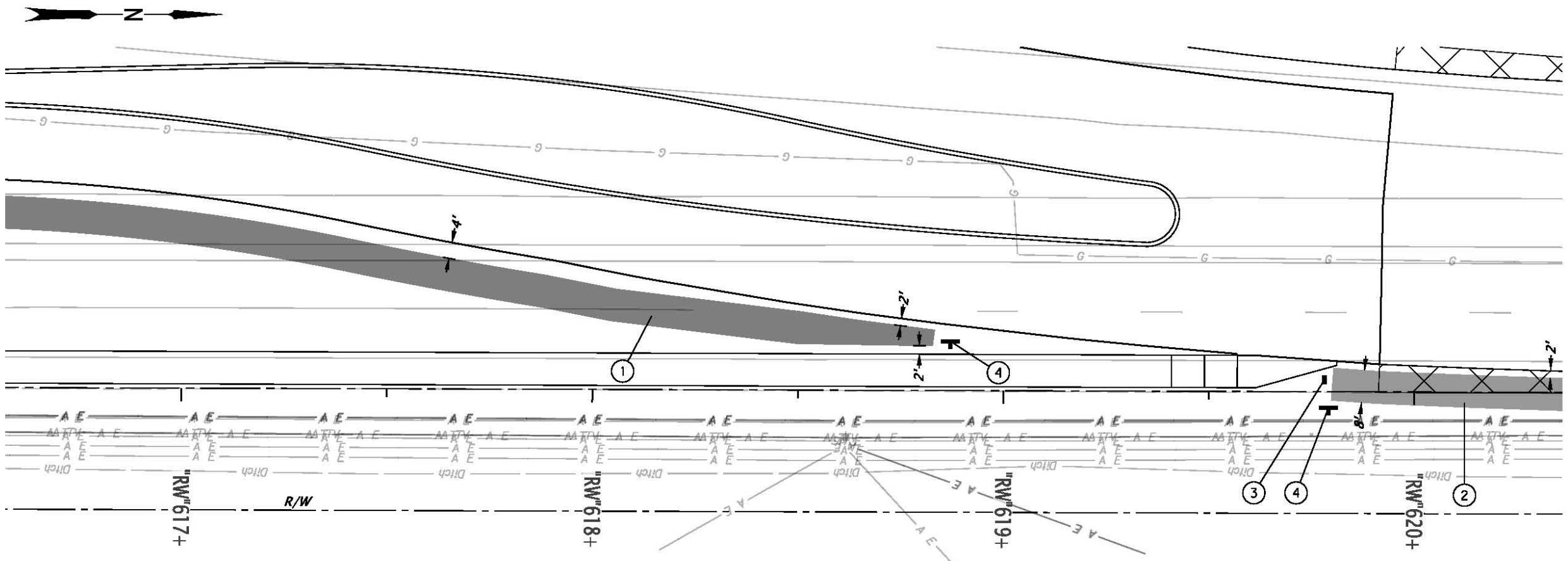


US20/OR201: BURNS TO ONTARIO PROJECT
CENTRAL OREGON & OLDS FERRY-ONTARIO HIGHWAYS
HARNEY & MALHEUR COUNTIES

Designer: Chris Diehl Reviewer: Matthew Seglin
Drafter: Chris Diehl Checker: Name

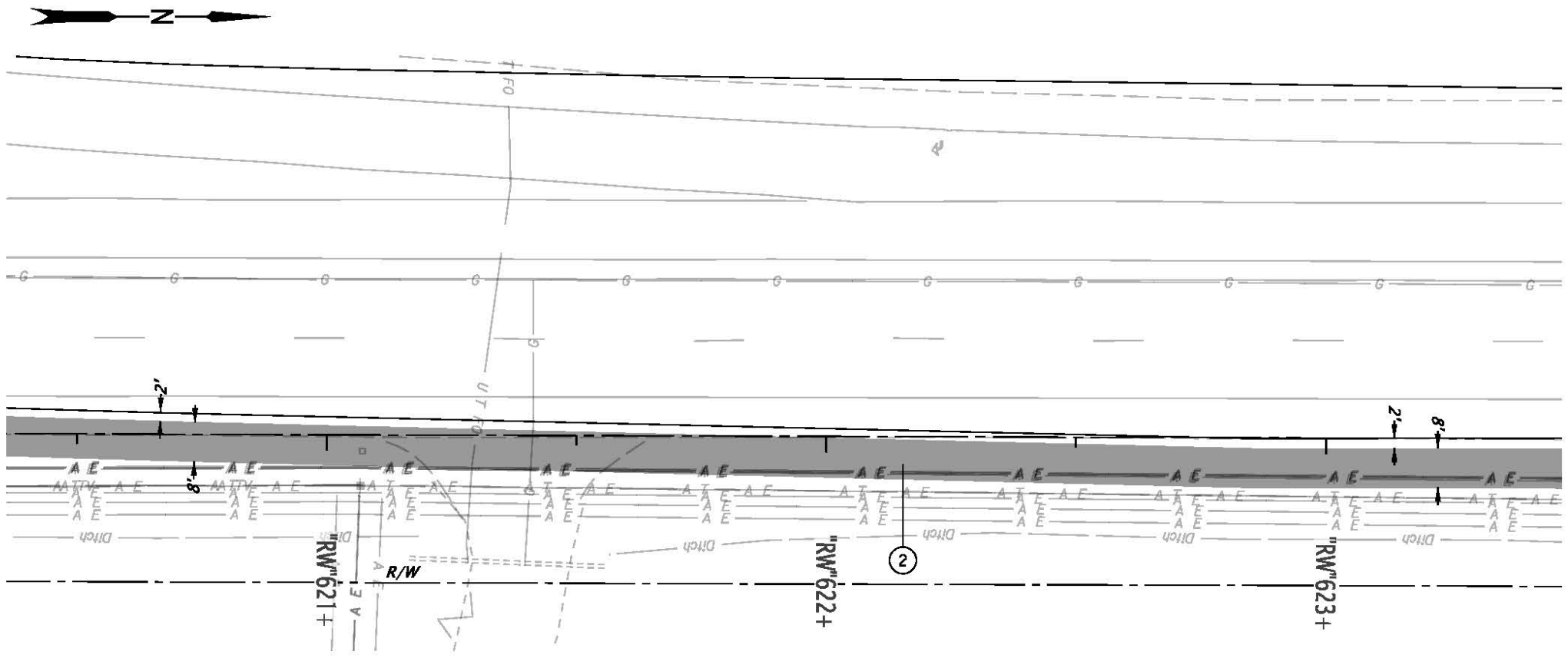
STORMWATER PLAN

SHEET NO.
HA01



- ① See Sht. HA01, note 4
Const. filter strip DFI no. D01490
- ② Sta. "RW" 619+80.29 Lt. to Sta. "RW" 625+75.07 Rt.
Const. filter strip DFI no. D01489
- ③ Inst. Type S-1 marker - red
- ④ Inst. Type S-2 marker

NOTE:
Maintain 2ft separation between filter strips and utility poles. For details, see sht. HA04.



FACILITY ID MARKER TABLE						
Facility Location		DFI Number	Type S2 Marker		Type S1 Marker	
Station	MP		Begin	End	Red	Green
"RW" 618+83.24 Lt.	31.69	D01490		✓		
"RW" 619+80.29 Lt.	31.67	D01489	✓		✓	

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

**FINAL REVIEW
PLANS**

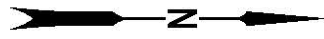
**OREGON DEPARTMENT
OF TRANSPORTATION**

US20/OR201: BURNS TO ONTARIO PROJECT
CENTRAL OREGON & OLDS FERRY-ONTARIO HIGHWAYS
HARNEY & MALHEUR COUNTIES

Designer: Chris Diehl Reviewer: Matthew Seglin
Drafter: Chris Diehl Checker: Name

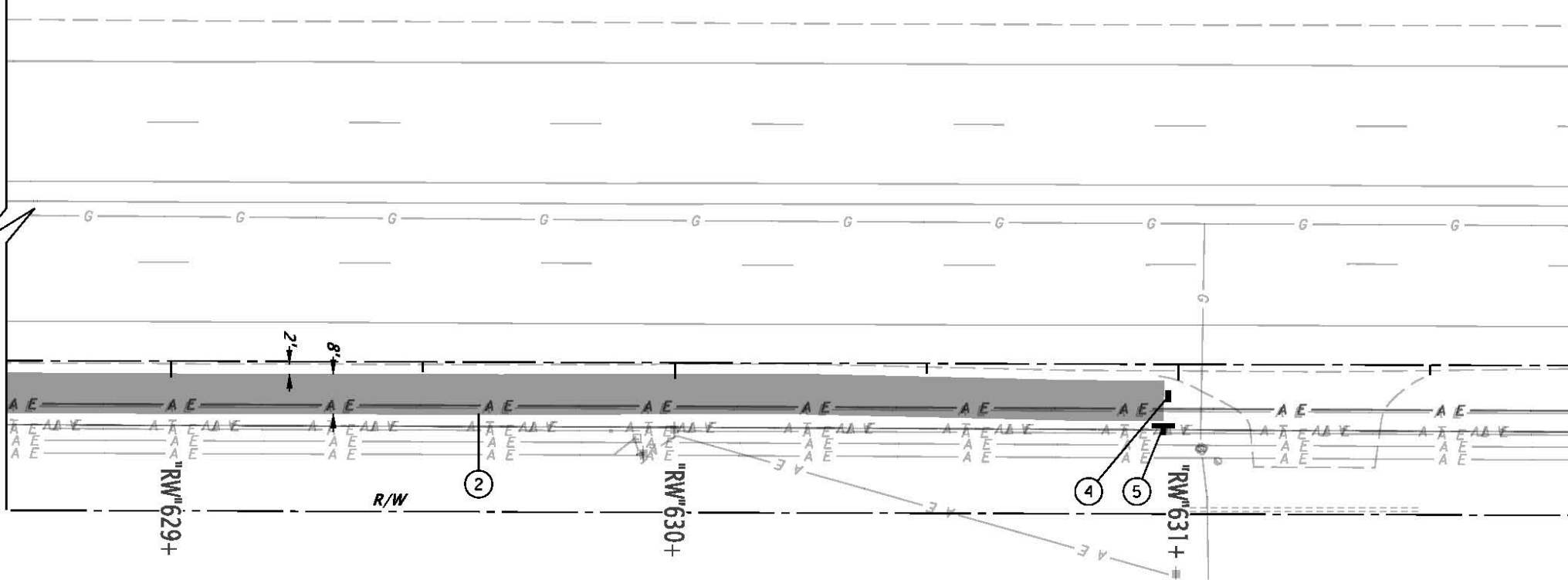
STORMWATER PLAN

SHEET NO.
HA02



- ① See sht. HA02, note 2
Const. filter strip DFI no. D01489
- ② Sta. "RW" 626+42.09 Rt. to Sta. "RW" 630+97.07 Rt.
Const. filter strip DFI no. D01488
- ③ Inst. Type S-1 marker - red
- ④ Inst. Type S-1 marker - green
- ⑤ Inst. Type S-2 marker

NOTE:
Maintain 2ft separation between filter strips and utility poles. For details, see sht. HA04.



Facility Location		DFI Number	Type S2 Marker		Type S1 Marker	
Station	MP		Begin	End	Red	Green
"RW" 625+75.07 Rt.	31.56	D01489		✓		✓
"RW" 626+42.09 Rt.	31.55	D01488	✓		✓	
"RW" 630+97.07 Rt.	31.46	D01488		✓		✓

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

**FINAL REVIEW
PLANS**

OREGON DEPARTMENT
OF TRANSPORTATION

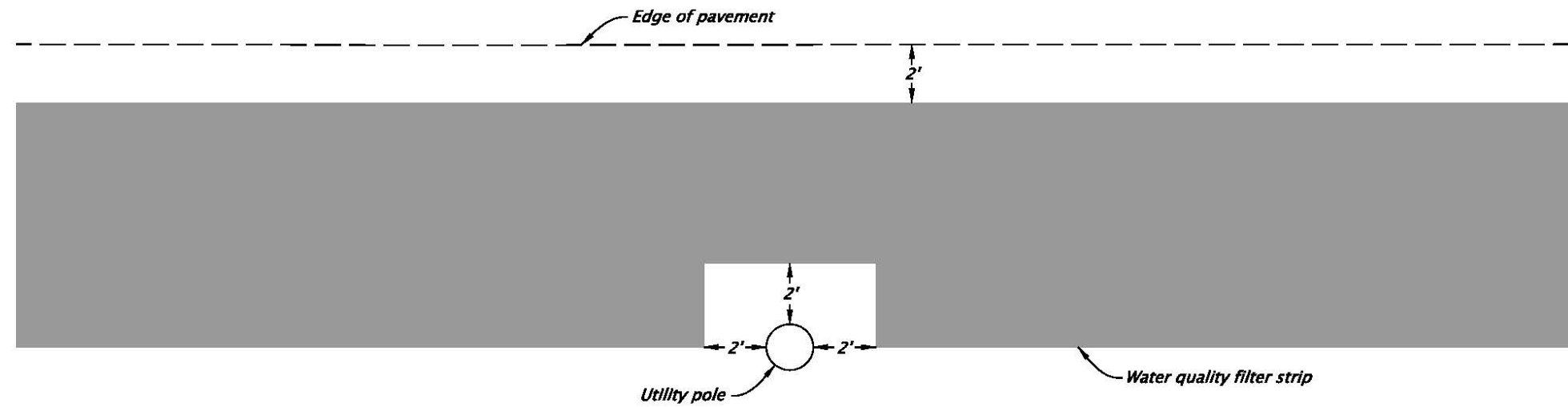


US20/OR201: BURNS TO ONTARIO PROJECT
CENTRAL OREGON & OLDS FERRY-ONTARIO HIGHWAYS
HARNEY & MALHEUR COUNTIES

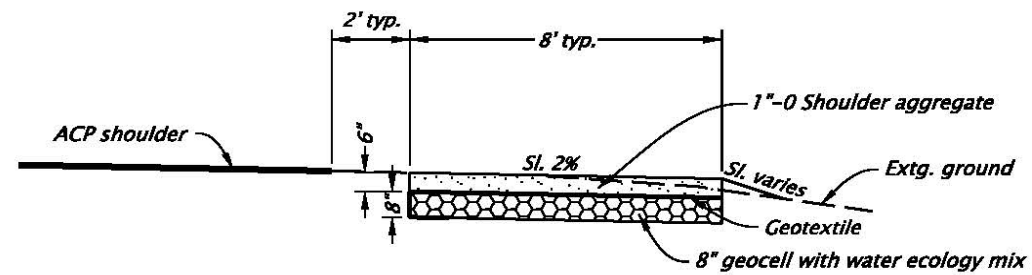
Designer: Chris Diehl Reviewer: Matthew Segrin
Drafter: Chris Diehl Checker: Name

STORMWATER PLAN

SHEET NO.
HA03



UTILITY POLE DETAIL PLAN VIEW



TYPICAL SECTION

**FINAL REVIEW
PLANS**

OREGON DEPARTMENT
OF TRANSPORTATION



US20/OR201: BURNS TO ONTARIO PROJECT
CENTRAL OREGON & OLDS FERRY-ONTARIO HIGHWAYS
HARNEY & MALHEUR COUNTIES

Designer: Chris Diehl Reviewer: Matthew Segrin
Drafter: Chris Diehl Checker: Name

DETAILS

SHEET NO.
HA04