

OPERATION & MAINTENANCE MANUAL

Water Quality Filter Strip

Manual prepared: December 2018

DFI No. D00619



Figure 1: DFI No. D00619, looking west

1. Identification

Drainage Facility ID (DFI): D00619
Facility Type: Water Quality Filter Strip
Construction Drawings: (V-File Numbers) 45V-073
Location: District: 3
Highway No.: 162
Mile Post: 10.13 to 10.23, right

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. **NOTE: Mile posts are based off of the V-File, and may vary from TransGIS mile posts.**

Facility location type: **Roadway shoulder**

Flow direction: south

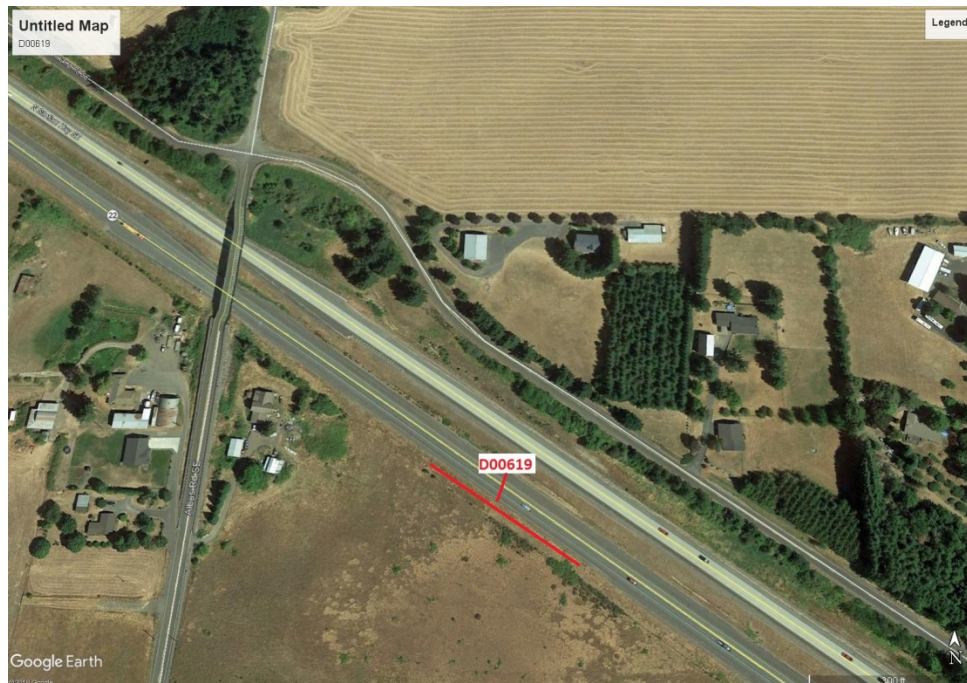


Figure 2:
2

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:

Component	Length (feet)	Width (feet)
Filter Strip	530	10

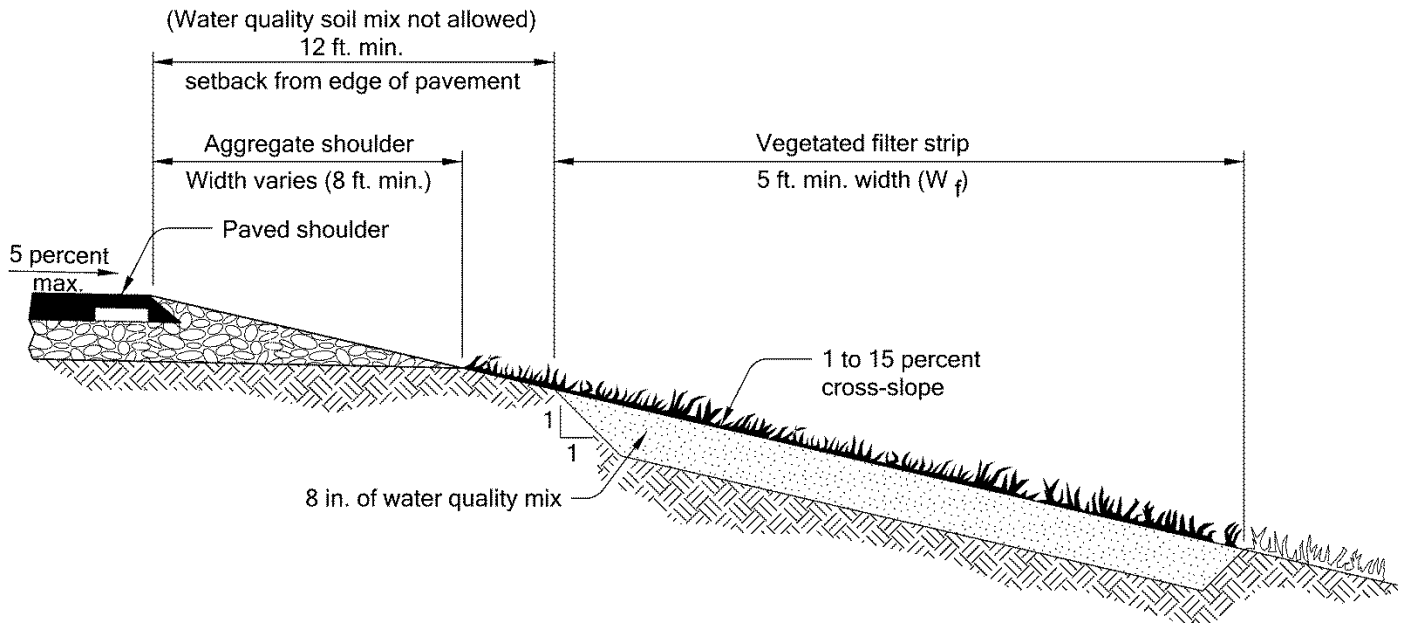


Figure 3: Filter Strip Section

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

Side Slope	Rise (feet)	Run (feet)
Filter Strip	1	4

Site Specific Information: A water quality filter strip is a grassed sloped area located between pavement and a downslope conveyance system designed to treat stormwater runoff from highway pavement areas. It relies on maintaining sheet flow across vegetated and permeable ground which maximizes stormwater contact with soil and vegetation. The filter strip is designed to treat runoff from the water quality design storm for an area along North Santiam Highway. It is located on the southside of the highway, starting at mile point 10.13 and ending at 10.23. The filter strip has a geocell grid system with a water quality mix.

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 4: Facility Access along Shoulder

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 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 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
Flow Spreader	<input type="checkbox"/>	B2
Ground Cover		
Vegetated Slope	<input checked="" type="checkbox"/>	B3
Aggregate Media Slope	<input type="checkbox"/>	B4
Underground Components		
Water Quality Mix	<input checked="" type="checkbox"/>	B5
Ecology Mix	<input type="checkbox"/>	B6
Granular Drain Backfill Material	<input type="checkbox"/>	B7
Geotextile Fabric	<input 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 (C reek/ L ake/ O cean)	<input type="checkbox"/> C	B17
	<input type="checkbox"/> L	
	<input type="checkbox"/> O	
Outfall Channel	<input 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>

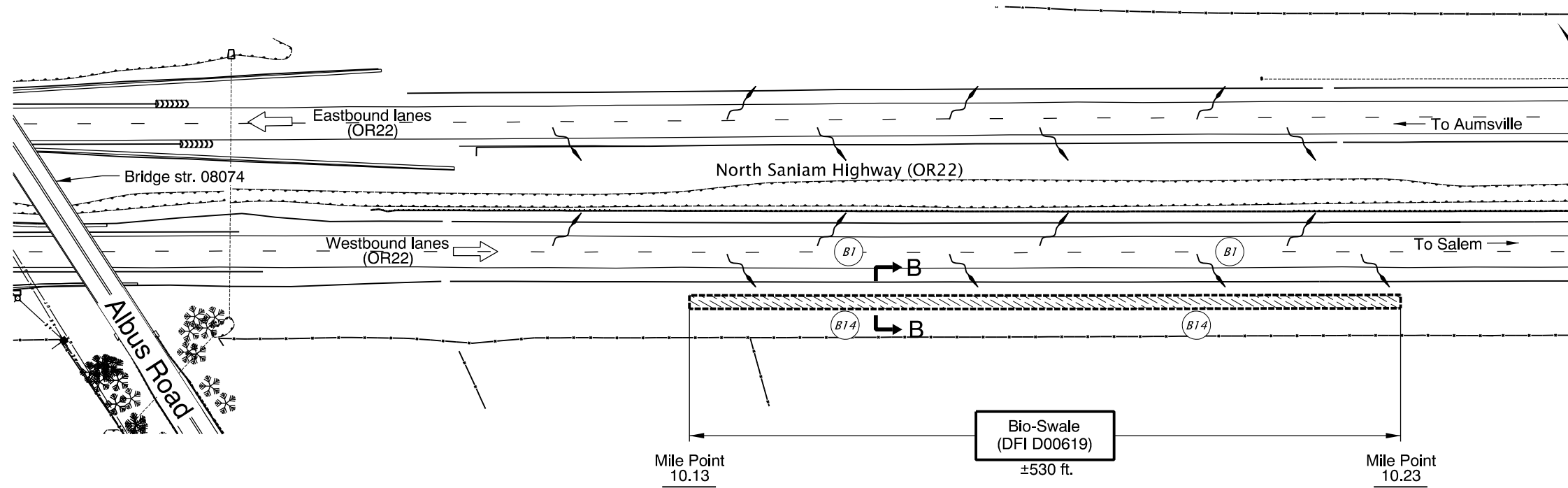
Contact any of the following for more detailed information about management of waste materials found on site:

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

Appendix A – Site Specific Operational Plan

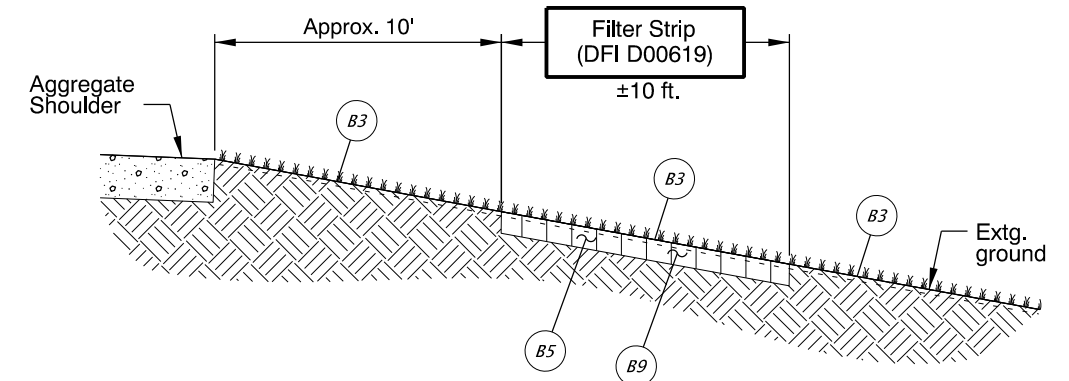
Contents:

Operational Plan: DFI D00619



- LEGEND:**
- Photo Location / Direction
 - Facility Component (see table 1 in O&M Manual)
 - Storm Pipe
 - Conveyance Direction
 - Pavement / Facility Flow Path

PLAN
N.T.S.



SECTION B-B
N.T.S.



OREGON DEPARTMENT OF TRANSPORTATION

Prepared By:

Consultant

Drafted By:

Michael Skelton

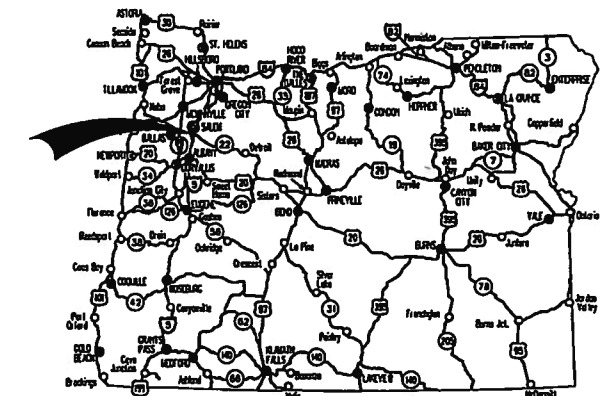
DFI D00619
MAINTENANCE DISTRICT 3 OR22
WATER QUALITY FILTER STRIP
NORTH SANTIAM HIGHWAY MP 9.94
MARION COUNTY

Appendix B – Project Contract Plans

Contents:

Site Specific Subset of Project Contract Plan 45V-073

STATE OF OREGON
 DEPARTMENT OF TRANSPORTATION
 PLANS FOR PROPOSED PROJECT
 GRADING, DRAINAGE, STRUCTURES, PAVING, SIGNING,
 ILLUMINATION, SIGNALS & ROADSIDE DEVELOPMENT



Overall Length Of Project - 8.37 Miles

ATTENTION:
 Oregon Law Requires You To Follow Rules
 Adopted By The Oregon Utility Notification
 Center. Those Rules Are Set Forth In
 OAR 952-001-0010 Through OAR 952-001-0090.
 You May Obtain Copies Of The Rules By Calling
 The Center. (Note: The Telephone Number For
 The Oregon Utility Center Is (503) 232-1987.)

**OR 22 BRIDGE VERTICAL CLEARANCE
 BRIDGE PROJECTS**

NORTH SANTIAM HIGHWAY
 MARION COUNTY
 JULY 2012

CORDON ROAD O'XING
 BRIDGE NO. 08473 (M.P. 2.82)

END OF CONTRACT

NH-S162(050)
 STA. "NS" 626+50 (M.P. 10.04)

ALBUS ROAD O'XING
 BRIDGE NO. 08077 (M.P. 10.04)

INDEX OF SHEETS	
SHEET NO.	DESCRIPTION
1	Title Sheet
1A	Index Of Sheets
1A-2	Std. Drg. Nos.

BEGINNING OF CONTRACT

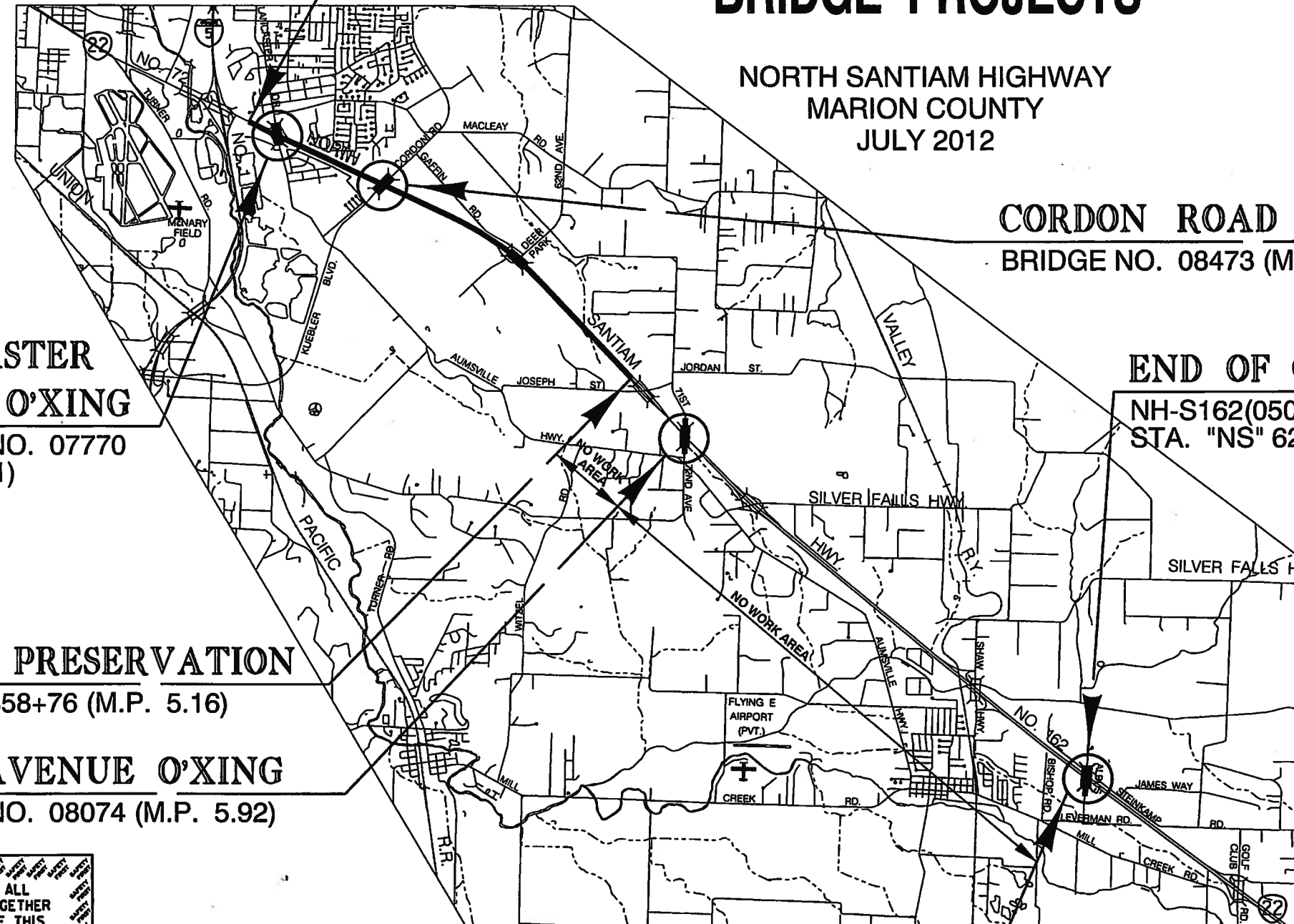
NH-S162(050)
 STA. "NS" 174+44 (M.P. 1.67)

**LANCASTER
 DRIVE O'XING**
 BRIDGE NO. 07770
 (M.P. 1.91)

END OF PRESERVATION

STA. "NS" 358+76 (M.P. 5.16)

72ND AVENUE O'XING
 BRIDGE NO. 08074 (M.P. 5.92)



T. 7 S., R. 2 W., W.M.
 T. 8 S., R. 2 W., W.M.
 T. 8 S., R. 1 W., W.M.



PLANS PREPARED FOR
 OREGON DEPARTMENT OF TRANSPORTATION
 BY:

WHPacific

3470 Pipebend Place
 Suite 170
 Salem, OR 97301
 t: 503.362.4675 f: 503.362.5078

OREGON TRANSPORTATION COMMISSION

- Pat Egan CHAIR
- Mary F. Olson COMMISSIONER
- David Lohman COMMISSIONER
- Mark Frohmayer COMMISSIONER
- Tammy Banay COMMISSIONER
- Matthew L. Garrett 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]* 5/14/12
 Signature & date

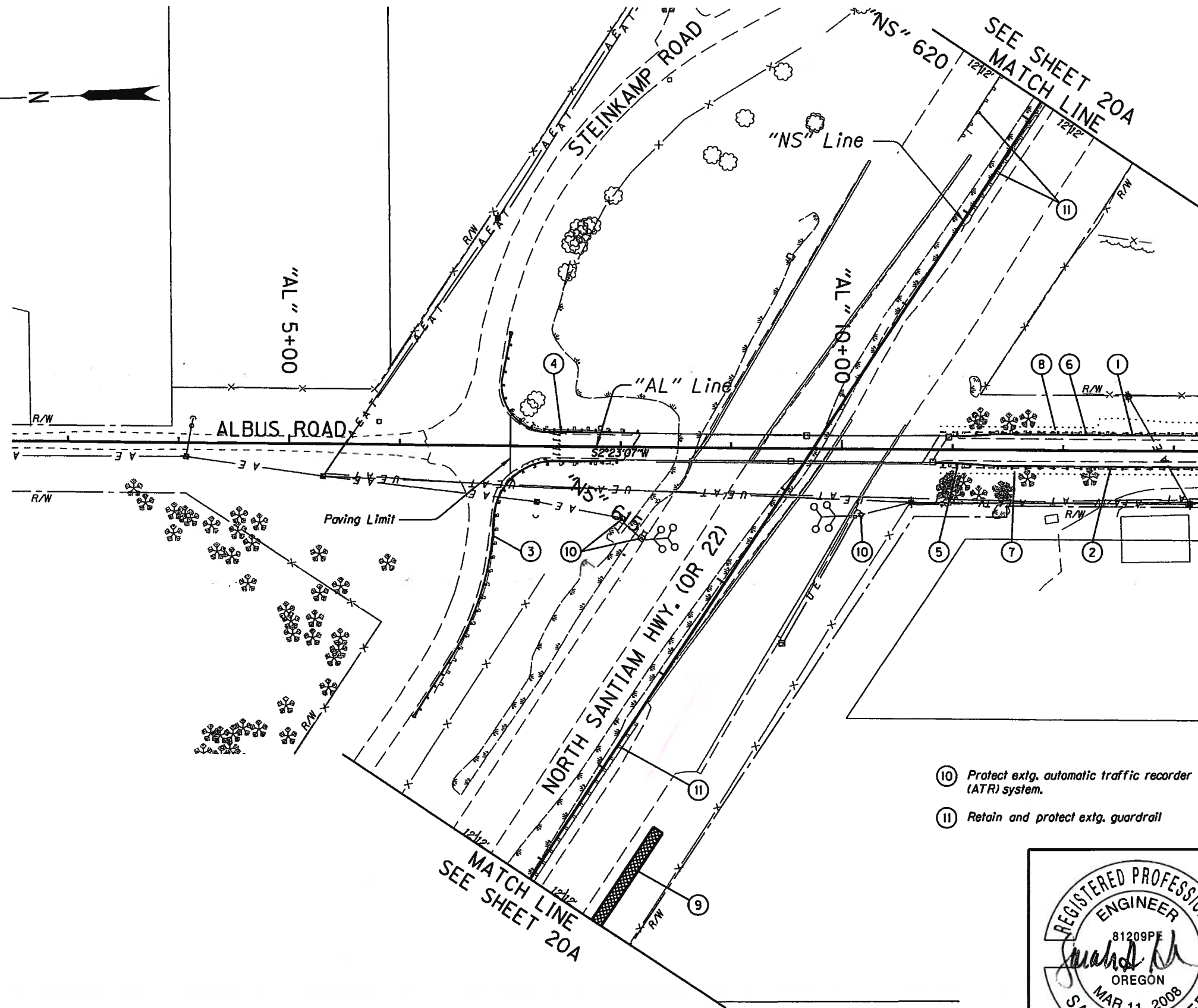
Ed Chamberland, Sr. P.M.
 Print name and title

[Signature]
 Concurrence by ODOT Chief Engineer

**OR22 BRIDGE VERTICAL CLEARANCE
 BRIDGE PROJECTS**

NORTH SANTIAM HIGHWAY
 MARION COUNTY

FEDERAL HIGHWAY ADMINISTRATION	PROJECT NUMBER	SHEET NO.
OREGON DIVISION	NH-S162(050)	1



- ① Sta. "AL" 10+84 to Sta. "AL" 14+92, Rt. Const. asph. conc. drainage curb
- ② Sta. "AL" 10+98 to Sta. "AL" 15+15, Lt. Const. asph. conc. drainage curb
- ③ Sta. "AL" 6+14.72, 246.2' Rt. to Sta. "AL" 7+99, 11.7' Rt. Remove extg. guardrail - 307' Const. guardrail - 225' (Type 2A) Const. guardrail - 75' (Type 3) R = 250' & 55' W=1', E=2', FL=0 Const. guardrail transition to bridge rail Const. guardrail terminal, non-flared Test level 2
- ④ Sta. "AL" 6+99.80, 102.6' Lt. to Sta. "AL" 8+17.30, 11' Lt. Remove extg. guardrail - 119' Const. guardrail - 62.5' (Type 2A) Const. guardrail - 75' (Type 3) R = 42' W=1', E=2', FL=0 Const. guardrail transition to bridge rail Const. guardrail terminal, non-flared Test level 3
- ⑤ Sta. "AL" 10+84 to Sta. "AL" 15+15, Rt. Remove extg. guardrail - 30' Const. guardrail - 362.5' (Type 2A) Const. guardrail - 12.5' (Type 3) W=1', E=2', FL=0 Const. guardrail transition to bridge rail
- ⑥ Sta. "AL" 10+98 to Sta. "AL" 15+35, Lt. Remove extg. guardrail - 155' Const. guardrail - 412.5' (Type 2A) Const. guardrail - 12.5' (Type 3) W=1', E=2', FL=0 Const. guardrail transition to bridge rail (For details, see Sht. 2B-2)
- ⑦ Sta. "AL" 10+80 to Sta. "AL" 14+67.33, Rt. Const. retaining wall (For drg. nos., see Sht. 1A)
- ⑧ Sta. "AL" 10+96 to Sta. "AL" 12+35.33, Lt. Const. retaining wall (For drg. nos., see Sht. 1A)
- ⑨ See Sht. 20A, Note 1 Const. water quality filter strip

- ⑩ Protect extg. automatic traffic recorder (ATR) system.
- ⑪ Retain and protect extg. guardrail

DFI D00618

OREGON DEPARTMENT OF TRANSPORTATION	
WHPacific	
3470 Pipebend Place NE Ste 170 Salem, OR 97301 t: 503.362.4675 f: 503.362.5078	
OR22 BRIDGE VERTICAL CLEARANCE BRIDGE PROJECTS	
NORTH SANTIAM HIGHWAY MARION COUNTY	
Design Team Leader - Sarah Heller Designed By - Devin Darling, Travis Sater Drafted By - Linda Foote	
GENERAL CONSTRUCTION	SHEET NO. 20



RENEWS: 06-30-2013

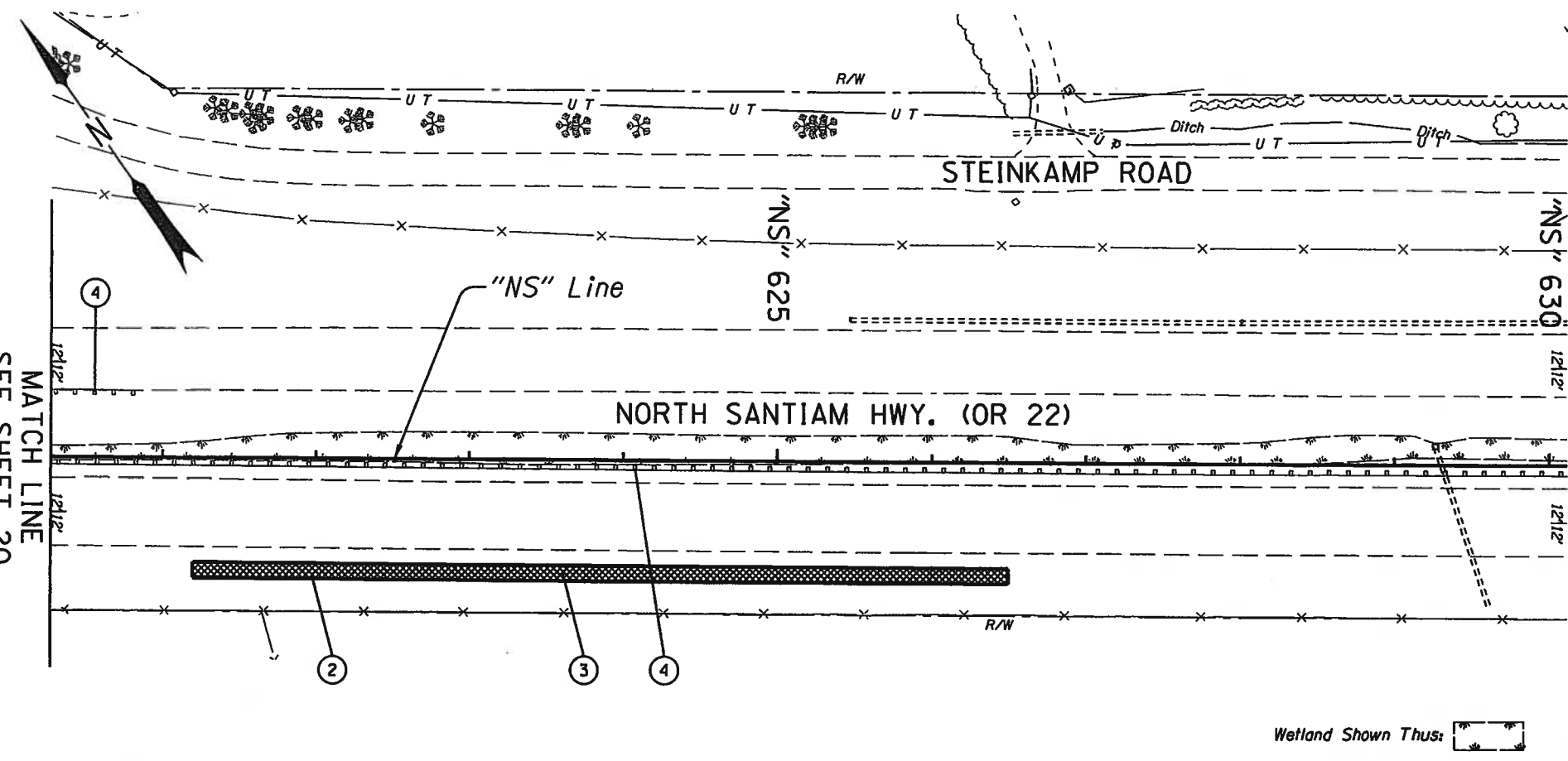
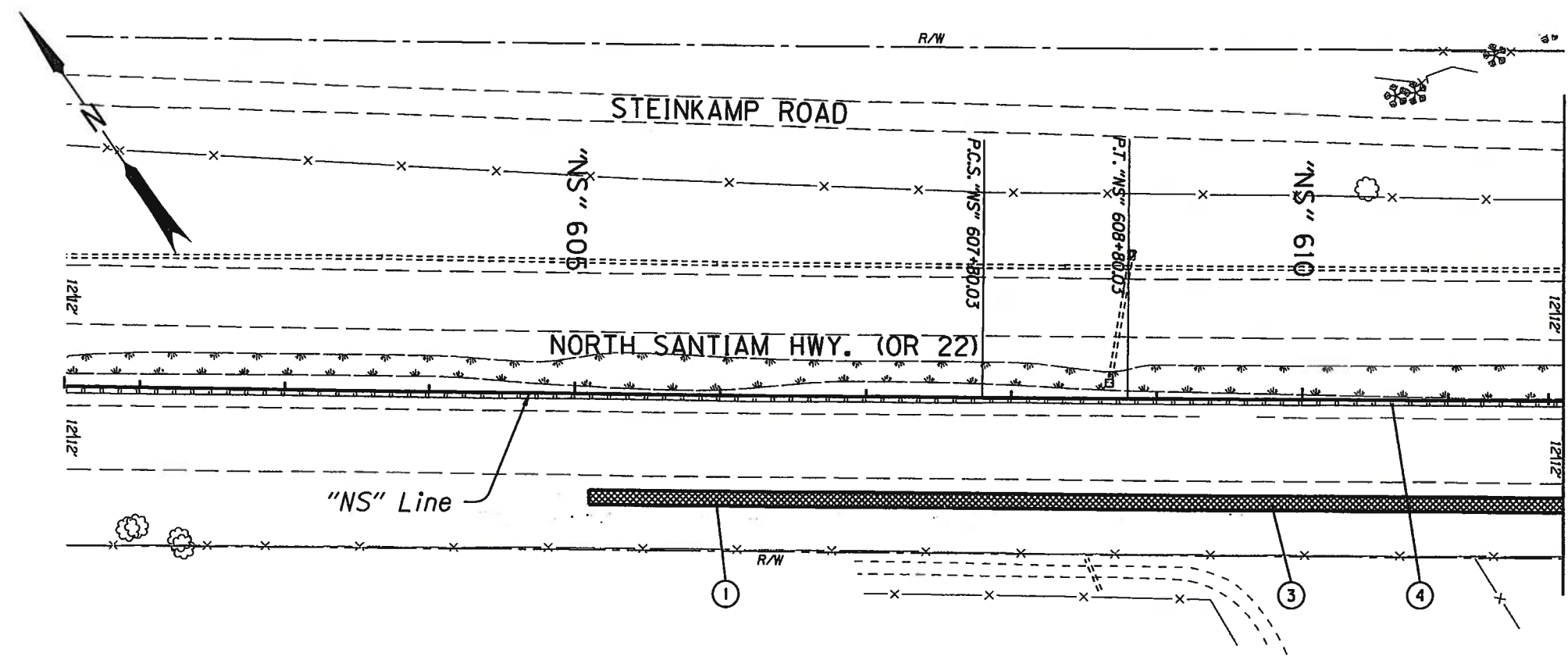
Wetland Shown Thus:

DFI D00618

- ① Sta. "NS" 605+10 to Sta. "NS" 612+80, Rt. Const. water quality filter strip, D00618 10' width
Inst. stormwater field markers (For details, see Sht. GJ)
- ② Sta. "NS" 621+20 to Sta. "NS" 626+50, Rt. Const. water quality filter strip, D00619 10' width
Inst. stormwater field markers (For details, see Sht. GJ)
- ③ Seed and mulch water quality filter strip with water quality seeding, mix no. 1 - 0.30 ac.
- ④ Retain and protect extg. guardrail

DFI D00619

SEE SHEET 20
MATCH LINE



Wetland Shown Thus: [hatched box]



RENEWS: 06-30-2013

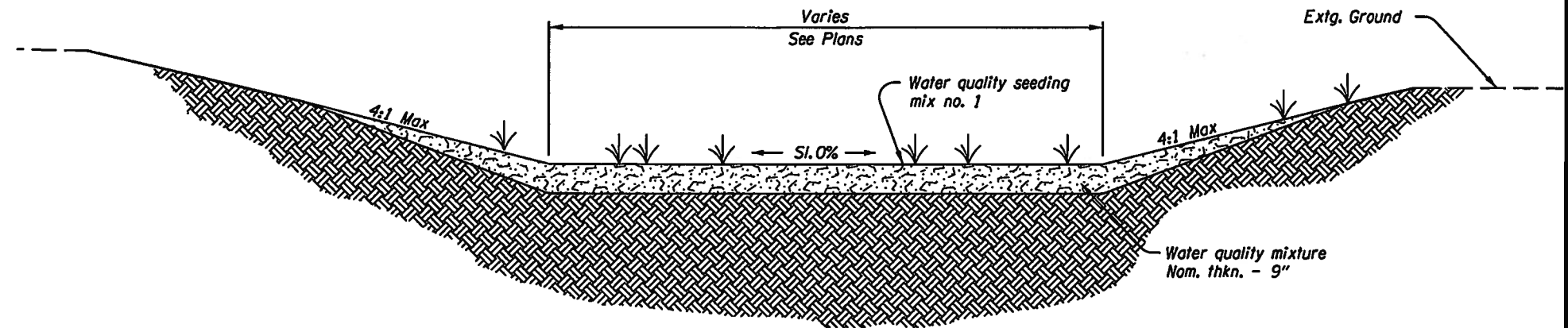
<p>OREGON DEPARTMENT OF TRANSPORTATION</p>	
<p>WHPacific 3470 Pipebend Place NE Ste 170 Salem, OR 97301 t: 503.362.4675 f: 503.362.5078</p>	
<p>OR22 BRIDGE VERTICAL CLEARANCE BRIDGE PROJECTS</p> <p>NORTH SANTIAM HIGHWAY MARION COUNTY</p>	
<p>Design Team Leader - Sarah Heller Designed By - Devin Doring, Travis Sater Drafted By - Linda Foote</p>	
<p>GENERAL CONSTRUCTION</p>	<p>SHEET NO. 20A</p>

STORMWATER CONTROL FIELD FACILITY MARKER TABLE

FACILITY LOCATION		DFI #	TYPE S2 MARKER LOCATION		TYPE S1 MARKER	
STATION	MP		BEGIN	END	RED	GREEN
"NS" 170+65, Rt.	1.60	D 00611	✓			
"NS" 236+40, Rt.	2.85	D 00612	✓		✓	
"NS" 236+40, Lt.	2.85	D 00613		✓		✓
"NS" 239+20, Rt.	2.90	D 00612		✓		✓
"NS" 239+50, Lt.	2.90	D 00613	✓		✓	
"NS" 264+67, Lt.	3.38	D 00614		✓		✓
"NS" 265+72, Lt.	3.40	D 00614	✓		✓	
"NS" 288+20, Lt.	3.83	D 00615	✓			
"NS" 400+60, Rt.	5.95	D 00616	✓			
"NS" 395+60, Lt.	5.86	D 00617	✓			
"NS" 605+10, Rt.	9.63	D 00618	✓		✓	
"NS" 612+80, Rt.	9.78	D 00618		✓		✓
"NS" 621+20, Rt.	9.94	D 00619	✓		✓	
"NS" 626+50, Rt.	10.04	D 00619		✓		✓

See drg. no. RD399

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



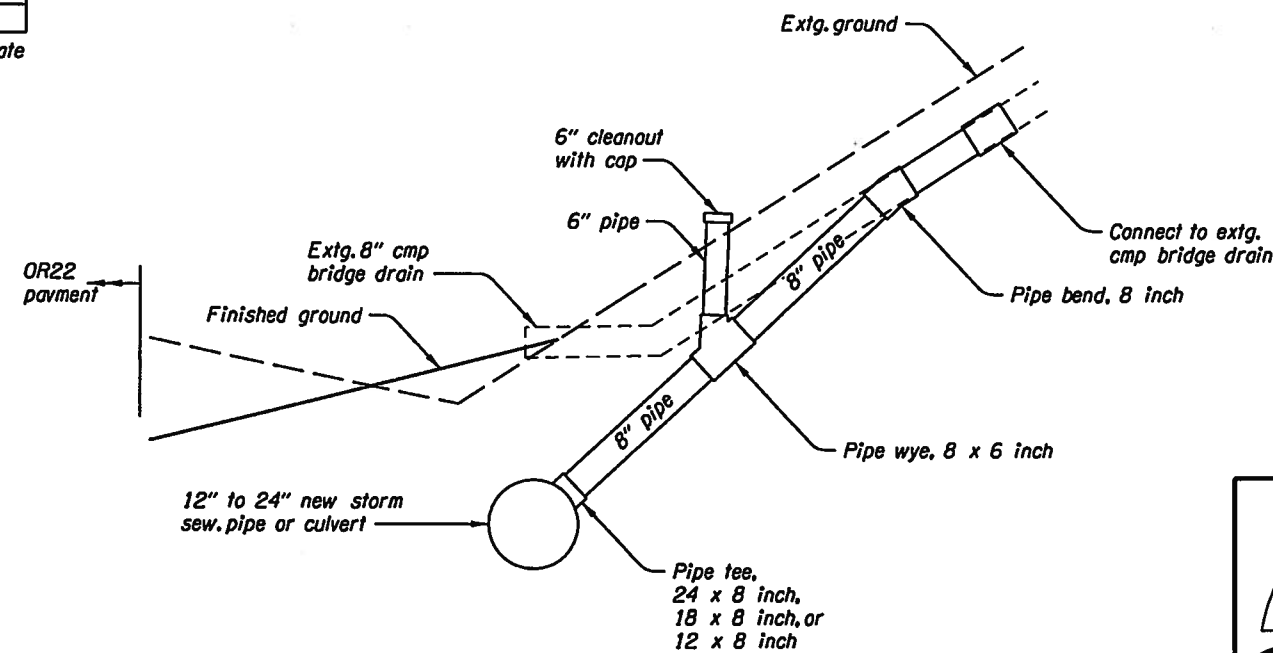
WATER QUALITY BIOFILTRATION SWALE
 N.T.S.

CULVERT DRAINAGE FACILITY MARKER TABLE

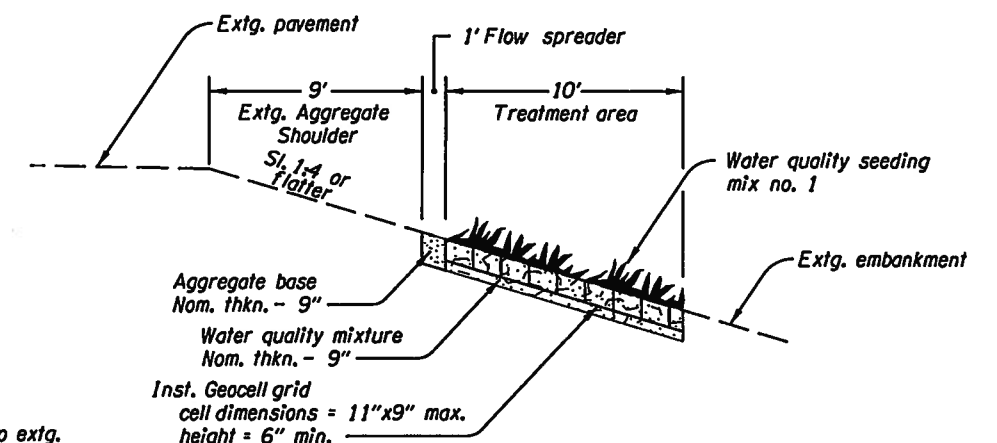
FACILITY LOCATION		TYPE 1 MARKER	
STATION	MP	INLET	INLET & OUTLET
"NS" 183+80	1.85	✓	
"B" 189+20	1.96	✓	
"D" 192+20	2.01	✓	
"NS" 237+60	2.87		✓
"NS" 266+50	3.40	✓	
"NS" 288+20	3.82	✓	

See drg. no. RD398

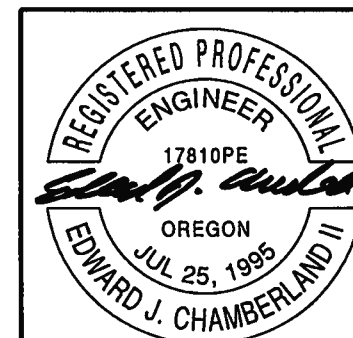
✓ Check where appropriate



TYPICAL BRIDGE DRAIN CONNECTION
 N.T.S.



WATER QUALITY FILTER STRIP
 N.T.S.



RENEWS: 12-31-2013

OREGON DEPARTMENT OF TRANSPORTATION	
WHPacific	
3470 Pipebend Place NE Ste 170 Salem, OR 97301 t: 503.362.4675 f: 503.362.5078	
OR22 BRIDGE VERTICAL CLEARANCE BRIDGE PROJECTS	
NORTH SANTIAM HIGHWAY MARION COUNTY	
Design Team Leader - Ed Chamberland Designed By - Travis Sater Drafted By - Linda Foote	
STORMWATER DETAILS	SHEET NO. GJ