

# OPERATION & MAINTENANCE MANUAL

## Water Quality Filter Strip

Manual prepared: March 2019

DFI No. D00952



Figure 1: DFI No. D00952, looking South on OR47

## 1. Identification

Drainage Facility ID (DFI): D00952  
Facility Type: Water Quality Filter Strip  
Construction Drawings: (V-File Numbers) 49V-012  
Location: District: 1  
Highway No.: OR47  
Mile Post: 87.83 to 87.88 [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: **West**



Figure 2: Facility location 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:

Component	Length (feet)	Width (feet)
Filter Strip	270	5

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	50

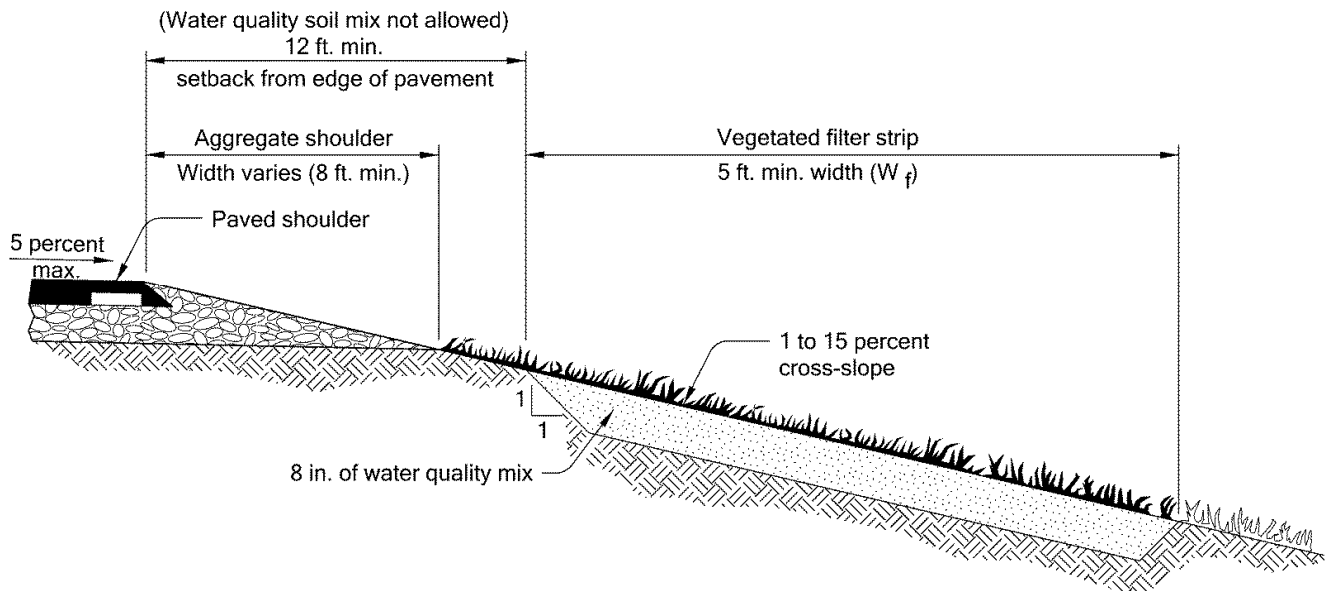


Figure 3: Filter Strip Section (see Appendix A, Site Specific Operational Plan)

**Site Specific Information:**

A water quality filter strip is a grassed sloped area located between pavement and a downslope conveyance system designed to treat storm water runoff from highway pavement areas. The media filter strip is designed to treat runoff from the water quality design storm for an area along the Nehalem Highway that cannot be directed elsewhere. It is located on the east side of the highway. If an overflow occurs in extreme storm conditions, the storm water would flow west into a ditch which drains into an 18” highway cross culvert directed to Council Creek (no ponding on the shoulder).

**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: DFI No. D00952, looking South on OR47, roadside shoulder access

## 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"/> <b>Filter Strip</b> <b>(Op Plan A)</b></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"/> <b>Bioslope</b> <b>(Op Plan B)</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><b>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.</b></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 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/>

## 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.

<b>Table 1: Bioslope/Filter Strip Components</b>		<b>ID #</b>
<b>Facility Inlet</b>		
Pavement Sheet Flow	<input checked="" type="checkbox"/>	<b>B1</b>
Flow Spreader	<input type="checkbox"/>	<b>B2</b>
<b>Ground Cover</b>		
Vegetated Slope	<input checked="" type="checkbox"/>	<b>B3</b>
Aggregate Media Slope	<input checked="" type="checkbox"/>	<b>B4</b>
<b>Underground Components</b>		
Water Quality Mix	<input checked="" type="checkbox"/>	<b>B5</b>
Ecology Mix	<input type="checkbox"/>	<b>B6</b>
Granular Drain Backfill Material	<input type="checkbox"/>	<b>B7</b>
Geotextile Fabric	<input type="checkbox"/>	<b>B8</b>
Geocell Grid	<input type="checkbox"/>	<b>B9</b>
<b>Structures</b>		
Curb/Berm	<input type="checkbox"/>	<b>B10</b>
Check Dam	<input type="checkbox"/>	<b>B11</b>
Cleanout	<input type="checkbox"/>	<b>B12</b>
<b>Facility Outlet</b>		
Perforated Drain Pipe	<input type="checkbox"/>	<b>B13</b>
Open Slope Outlet (if overflow)	<input checked="" type="checkbox"/>	<b>B14</b>
Open Channel Outlet	<input type="checkbox"/>	<b>B15</b>
Storm Drain Outlet Pipe	<input type="checkbox"/>	<b>B16</b>
<b>Outfall Type</b>		
Waterbody (Creek/Lake/Ocean)	<input checked="" type="checkbox"/> <b>C</b>	<b>B17</b>
	<input type="checkbox"/> <b>L</b>	
	<input type="checkbox"/> <b>O</b>	
Outfall Channel	<input type="checkbox"/>	<b>B18</b>
Storm Drain System	<input type="checkbox"/>	<b>B19</b>
<b>Outfall Components</b>		
Pervious Berm	<input type="checkbox"/>	<b>B20</b>
Riprap Pad	<input type="checkbox"/>	<b>B21</b>



## 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](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:

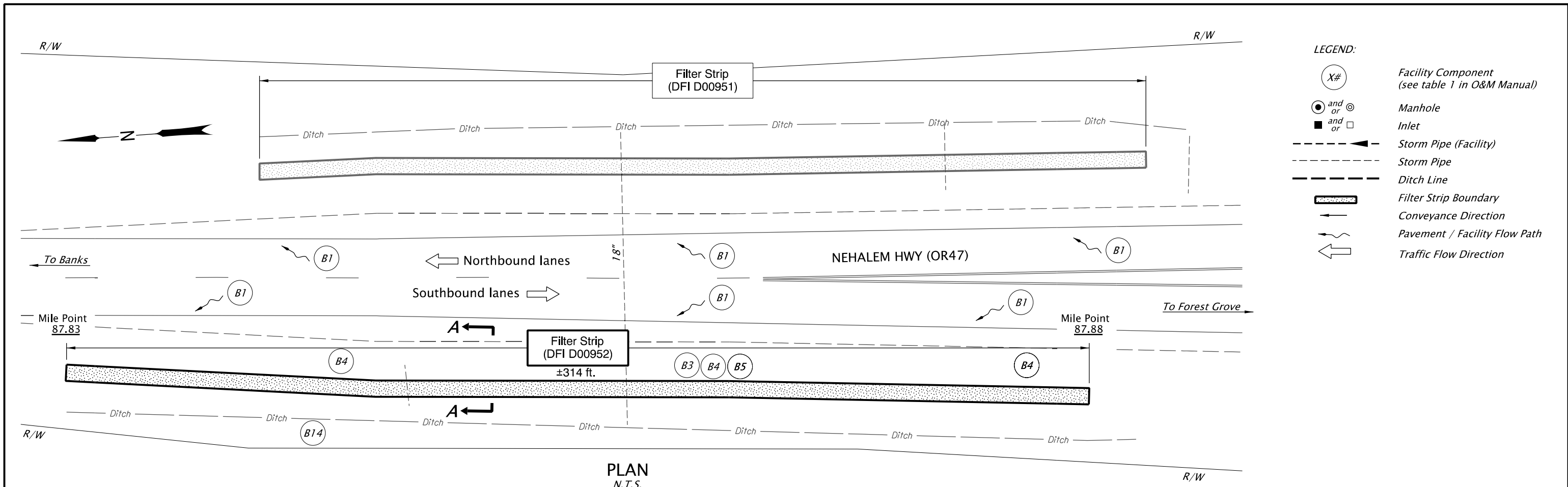
ODOT Clean Water Unit	(503) 986-3008
ODOT Statewide Hazmat Coordinator	(503) 667-7442
ODOT Region 1 Hazmat Coordinator	(503) 731-8290
ODOT Region 2 Hazmat Coordinator	(503) 986-2647
ODOT Region 3 Hazmat Coordinator	(541) 957-3594
ODOT Region 4 Hazmat Coordinator	(541) 388-6186
ODOT Region 5 Hazmat Coordinator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



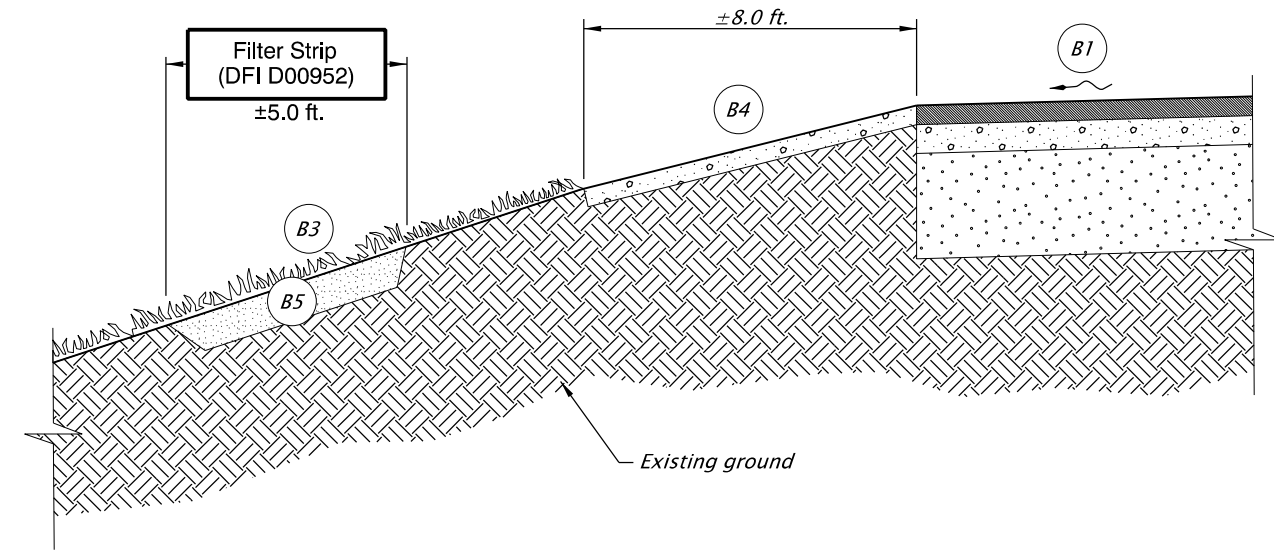
## **A Appendix A – Site Specific Operational Plan**

### **Contents:**

**Operational Plan: DFI D00952**



- LEGEND:**
- (X#) Facility Component (see table 1 in O&M Manual)
  - and/or ⊙ Manhole
  - and/or □ Inlet
  - Storm Pipe (Facility)
  - - - Storm Pipe
  - - - Ditch Line
  - ▨ Filter Strip Boundary
  - Conveyance Direction
  - ↔ Pavement / Facility Flow Path
  - ← Traffic Flow Direction



Prepared By:  
Ramiro Perez

Drafted By:  
Jeff Coon

**DFI D00952**  
**MAINTENANCE DISTRICT 1 HWY 102**  
**WATER QUALITY FILTER STRIP**  
NEHALEM HIGHWAY MP 87.83  
WASHINGTON COUNTY

## **B Appendix B – Project Contract Plans**

### **Contents:**

**Site Specific Subset of Project Contract Plan 49V-012**

INDEX OF SHEETS		
SHEET NO.	SHEET TITLE	DESCRIPTION
1	1	Title Sheet
2	1A	Index of Sheets & Std. Drg. Reference
3	1B	Key Map

(Cont. on Sheet 1A)

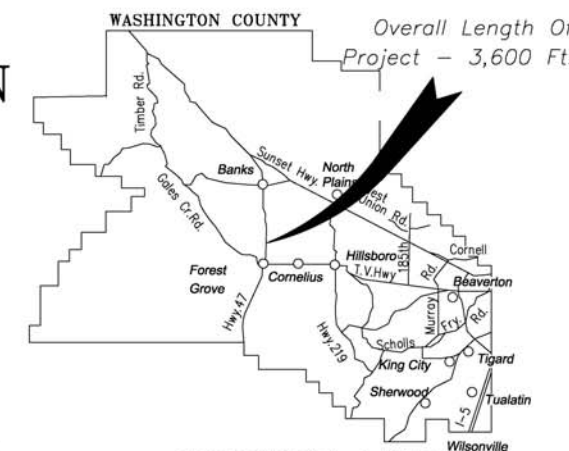
WASHINGTON COUNTY, OREGON  
DEPARTMENT OF LAND USE AND TRANSPORTATION  
PLANS FOR PROPOSED PROJECT



GRADING, DRAINAGE, PAVING, SIGNING, & STRIPING,  
ILLUMINATION, LANDSCAPING

OR47 - VERBOORT/PURDIN ROAD  
ROUNDAABOUT

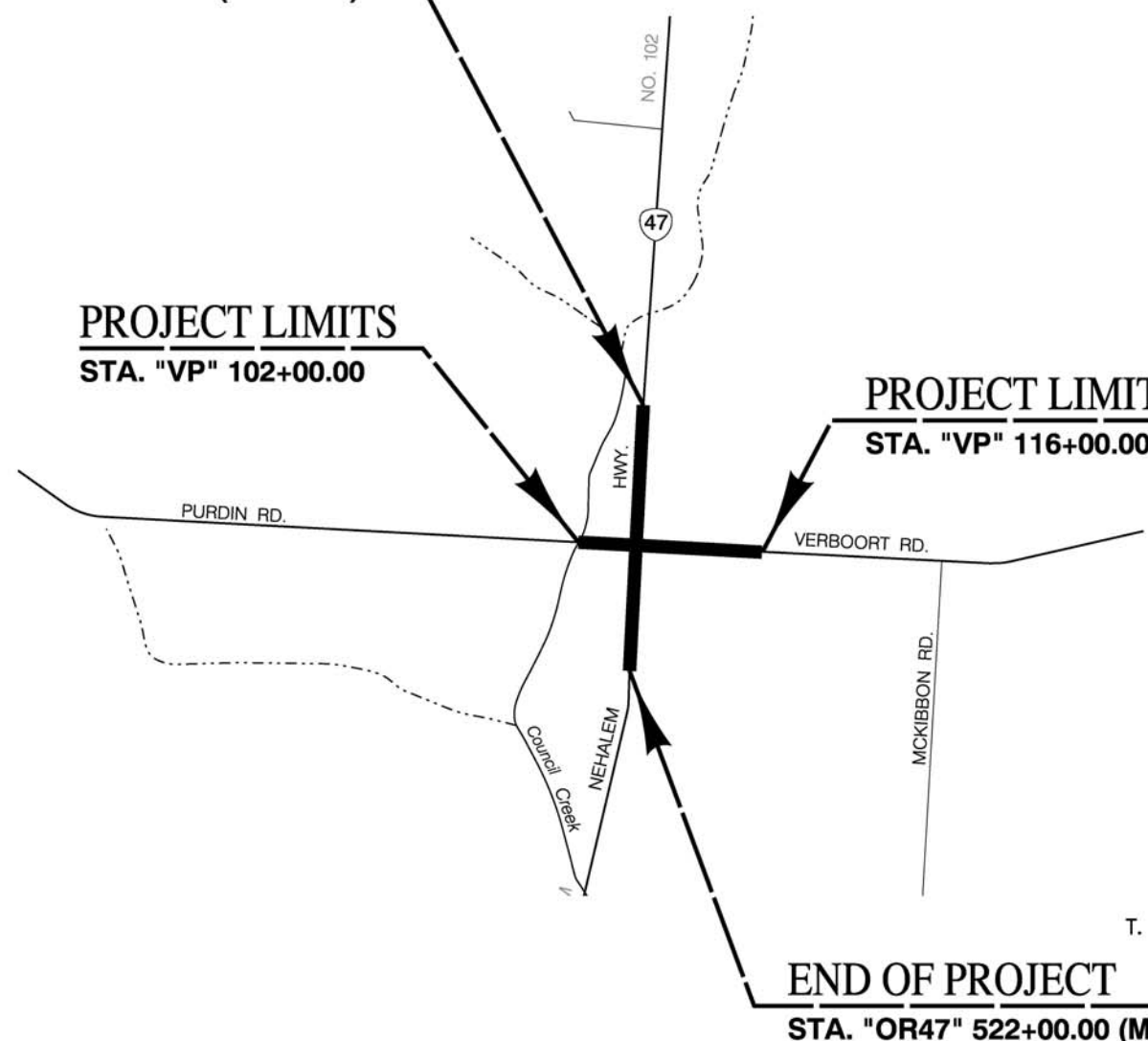
WASHINGTON COUNTY  
NOVEMBER 2015



VICINITY MAP

BEGINNING OF PROJECT

STA. "OR47" 500+00.00 (M.P. 87.8)



PROJECT LIMITS

STA. "VP" 102+00.00

PROJECT LIMITS

STA. "VP" 116+00.00

END OF PROJECT

STA. "OR47" 522+00.00 (M.P. 88.3)

BASIS OF BEARINGS:

BASIS OF BEARINGS IS THE LINE BETWEEN FOUND MONUMENTS PV04 AND POINT NO. 1023, WHICH LINE BEARS N81°36'40"E 5176.37 FEET. CONTROL WAS ESTABLISHED IN THE OREGON COORDINATE SYSTEM OF 1983, NORTH ZONE BY RTK GPS, UTILIZING THE ODOT RTK ORGN NETWORK.

THE HORIZONTAL DATUM IS NAD 83(96)(EPOCH 2002), BEARINGS ARE GRID, DISTANCES ARE GROUND, AND UNITS ARE INTERNATIONAL FEET. STATE PLANE COORDINATES (SPC) WERE REDUCED TO LOCAL DATUM PLANE (LDP) BY DIVIDING SPC BY THE COMBINED SCALE FACTOR OF 0.99991012502.

ELEVATION DATUM:

VERTICAL DATUM ELEVATIONS ARE BASED ON CITY OF FOREST GROVE VERTICAL DATUM, BEING THE U.S.C. & G.S. 1934 ADJUSTMENT OF THE NGVD 29 DATUM. THE FINAL ADJUSTMENT TO THE NGVD 29 DATUM OCCURRED IN 1947 WHILE THE CITY OF FOREST GROVE RETAINED THE 1934 ADJUSTMENT. BASIS FOR ELEVATIONS WAS TAKEN FROM WASHINGTON COUNTY BENCHMARK NO. 952, A 1-1/4" BRASS DISK LOCATED IN THE SIDEWALK ON THE EAST SIDE OF THATCHER ROAD, APPROXIMATELY 250 FEET SOUTH OF DAVID HILL ROAD, NEAR THE STEPS INTO A SUBDIVISION, WITH A NGVD 29 ELEVATION OF 236.654 FEET. 0.49 FEET WAS SUBTRACTED FROM THE NGVD 29 DATUM TO GET THE CITY OF FOREST GROVE DATUM.

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 From The Center.

"This Design Complies with ORS 92.044(7), In That No Utility Infrastructure is Designed to be Within 1 Ft. of a Survey Monument Location Shown on a Subdivision or Partion Plat. No Design Modification Nor Final Field Location Change Shall be Permitted If it Would Cause Any Utility Infrastructure to be Placed Within the Prohibited Area."

SECTION 30  
T. 1 N, R. 3 W., W. M.



AS BUILT DRAWINGS

Revisions Drawn By Sean Atwood Date October, 2017

THESE AS BUILT DRAWINGS HAVE BEEN PREPARED, IN PART, ON THE BASIS OF INFORMATION COMPILED BY OTHERS. THEY ARE NOT INTENDED TO REPRESENT IN DETAIL THE EXACT LOCATION, TYPE OF COMPONENT NOR MANNER OF CONSTRUCTION. THE ENGINEER WILL NOT BE RESPONSIBLE FOR ANY ERRORS OR OMISSIONS WHICH HAVE BEEN INCORPORATED INTO THE AS BUILT DRAWINGS.

FOR STANDARD DRG. NOS. SEE SHT 1A

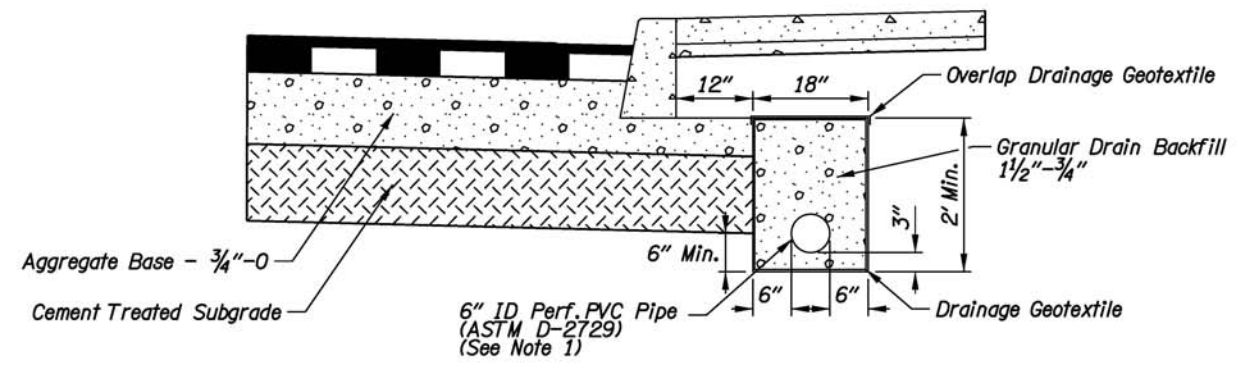
DWG: 496411ts.dgn

NO.	REVISIONS

OR47 - VERBOORT/PURDIN ROAD  
WASHINGTON COUNTY

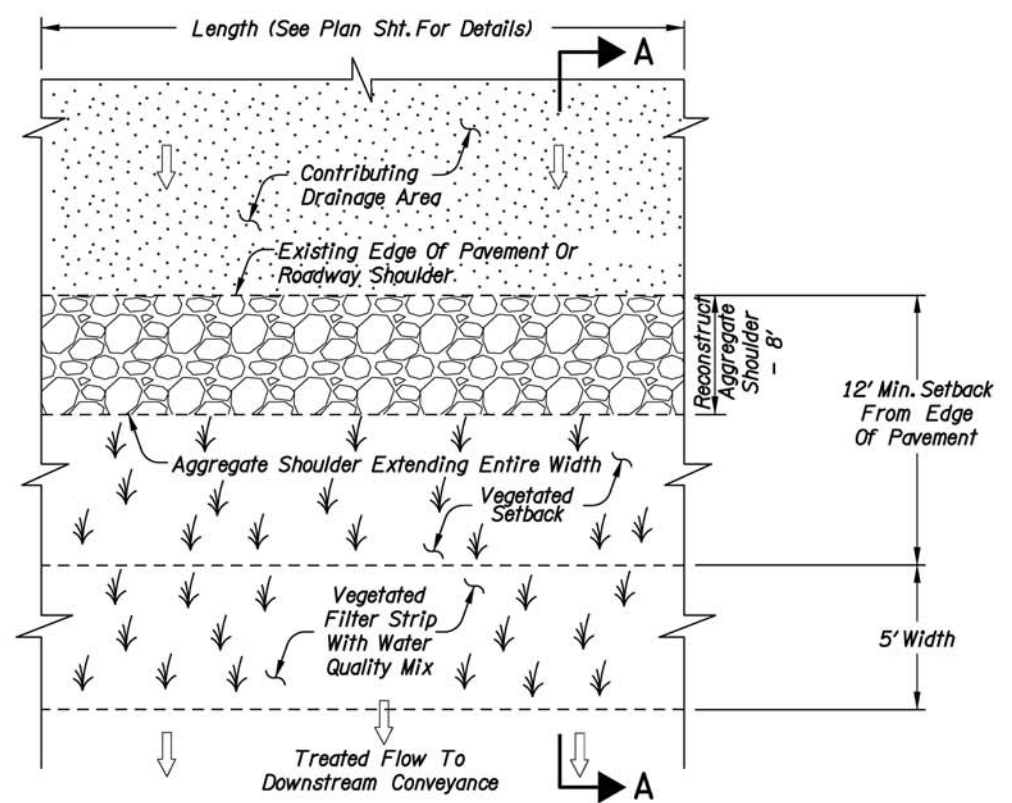
TITLE SHEET AND  
VICINITY MAP

	BY	DATE
DRWN:	SA	Jul-15
DSGN:	PPR	Jul-15
CHKD:	JAB	Jul-15

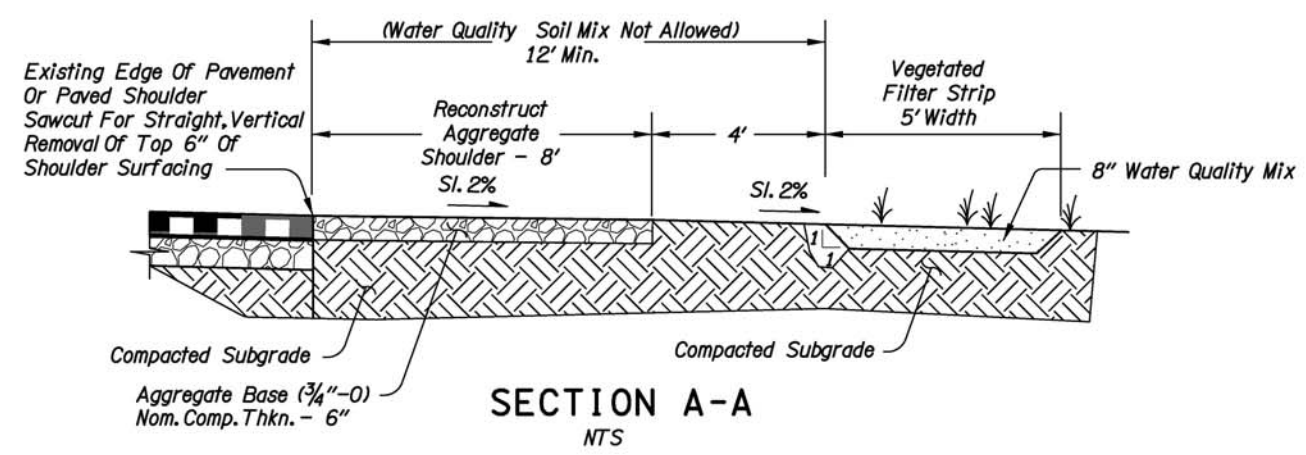


**SUBGRADE DRAIN**

Notes:  
1. Const. Perf. Pipe Outlets  
To Drain At Intervals Not  
Greater Than 200'.



**WATER QUALITY FILTER STRIP  
PLAN**  
NTS



**SECTION A-A**  
NTS

DWG: 496411d01.dgn

NO.	REVISIONS

OR47 - VERBOORT/PURDIN ROAD  
WASHINGTON COUNTY  
**DRAINAGE DETAILS**

	BY	DATE
DRWN:	SJA	Mar-16
DSGN:	PPR	Mar-16
CHKD:	JAB	Mar-16

THE CONTRACT DOCUMENT DRAWINGS ARE THE PRINTED DOCUMENTS DATED NOVEMBER, 2015 AS SUBSEQUENTLY OFFICIALLY AMENDED, WHICH DEFINE THE SCOPE, EXTENT, AND CHARACTER OF THE WORK. THIS ORIGINALLY ISSUED CONTRACT DOCUMENT DRAWING WAS SEALED AND SIGNED BY JEFFERY SHAWN STALLARD OREGON P.E. NO. 82930PE IN JULY, 2015

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For Drainage Facility ID, See Notes 1 And 3, Sht. 3.

PROJECT NUMBER  
100207

49V-012



Department of  
Land Use &  
Transportation  
Engineering and  
Construction Services,  
Engineering

DWG:	496411p03.dgn
NO.	1
REVISIONS	Added Field Marker

OR47 - VERBOORT/PURDIN ROAD  
WASHINGTON COUNTY  
ROADWAY AND DRAINAGE  
NOTES  
STA "OR47" 500+00 TO STA "OR47" 509+00

BY	DATE
DRWN: SJA	Mar-16
DSGN: PPR	Mar-16
CHKD: JAB	Mar-16

THE CONTRACT DOCUMENT DRAWINGS ARE THE PRINTED DOCUMENTS DATED JULY, 2015 AS SUBSEQUENTLY OFFICIALLY AMENDED, WHICH DEFINE THE SCOPE, EXTENT, AND CHARACTER OF THE WORK. THIS ORIGINALLY ISSUED CONTRACT DOCUMENT DRAWING WAS SEALED AND SIGNED BY JOHN A. BLAND OREGON P.E. NO. 17643PE IN JULY, 2015

THE CONTRACT DOCUMENT DRAWINGS ARE THE PRINTED DOCUMENTS DATED NOVEMBER, 2015 AS SUBSEQUENTLY OFFICIALLY AMENDED, WHICH DEFINE THE SCOPE, EXTENT, AND CHARACTER OF THE WORK. THIS ORIGINALLY ISSUED CONTRACT DOCUMENT DRAWING WAS SEALED AND SIGNED BY JEFFERY SHAWN STALLARD OREGON P.E. NO. 82930PE IN JULY, 2015

SHEET NO.  
3

CH2MHILL.

- ① Sta. "OR47" 500+69, Lt. Begin Water Quality Filterstrip, No. 1 Drainage Facility ID - D 00951 (For Details, See Sht. 2C)
- ② Sta. "OR47" 503+41, Lt. End Water Quality Filterstrip, No. 1 (For Details, See Sht. 2C)
- ③ Sta. "OR47" 500+10, Rt. Begin Water Quality Filterstrip, No. 2 Drainage Facility ID - D 00952 (For Details, See Sht. 2C)
- ④ Sta. "OR47" 503+24, Rt. End Water Quality Filterstrip, No. 2 (For Details, See Sht. 2C)
- ⑤ Const. Stamped P.C. Conc. Splitter Island And Nose Treatment (For Details, See Sht. 2B-2)
- ⑥ Const. Curb And Gutter (ACP Section) (For Details, See Sht. 2B-3)
- ⑦ Sta. "OR47" 501+81.81, 49.49' Rt. Extend 18" CMP Culv. At Extg. Slope (1.7%±) - 13' F.L. 166.77 (For Details, See Std. Drgs. RD317, RD318 & RD320)
- ⑧ Const. P.C. Conc. Sidewalk (For Details, See Sht. 2B And Std. Drg. RD720)
- ⑨ Sta. "OR47" 503+92.62 To Sta. "OR47" 504+58.00 Cold Plane Pavement Removal - 5" And Overlay To Finished Grade (For Details, See Std. Drg. RD610)
- ⑩ Const. Curb End Transition And P.C. Conc. Ramp (For Details, See Sht. 2B And Std. Drg. RD756)
- ⑪ Protect Existing Field Drain
- ⑫ For Ditch Profile, See Curb Plan And Profile Sheets
- ⑬ Sta. "OR47" 501+81.82, 47.19' Lt. Extend 18" CMP Culv. At Extg. Slope (1.7%±) - 13' F.L. 168.43 (For Details, See Std. Drgs.)
- ⑭ Const. 6" Drain Pipe - 5050' (For Details, See Sht. 2C)
- ⑮ Inst. Facility Field Marker Type S1 (For Details, See Std. Drg. RD399)
- ⑯ Inst. Facility Field Marker Type S2 (For Details, See Std. Drg. RD399)



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