OPERATION & MAINTENANCE MANUAL

Water Quality Biofiltration Swale

Manual prepared: February, 2019

DFI No. D00840

Figure 1: DFI No. D00840, looking north

Identification

Drainage Facility ID (DFI):	D00840
Facility Type:	Water Quality Biofiltration Swale
Construction Drawings:	(V-File Numbers) 47V-086
Location:	District: 5
	Highway No.: 91
	Mile Post: 121.44 to 121.63

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: [north to south]

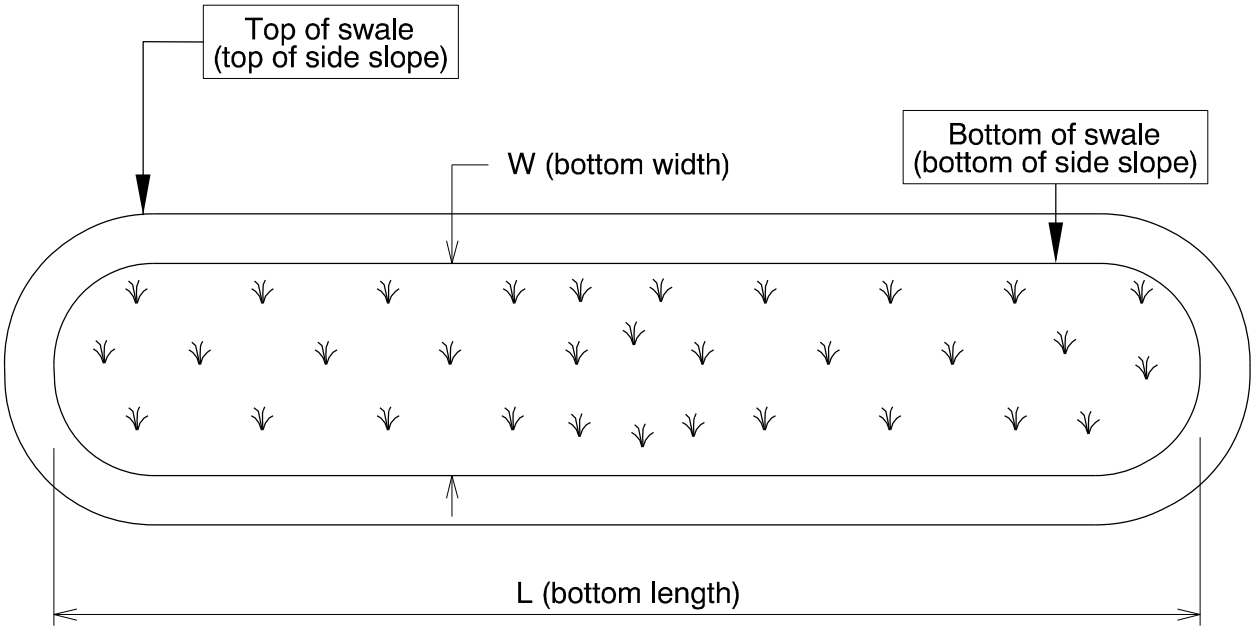
Figure 2: Facility location map

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:

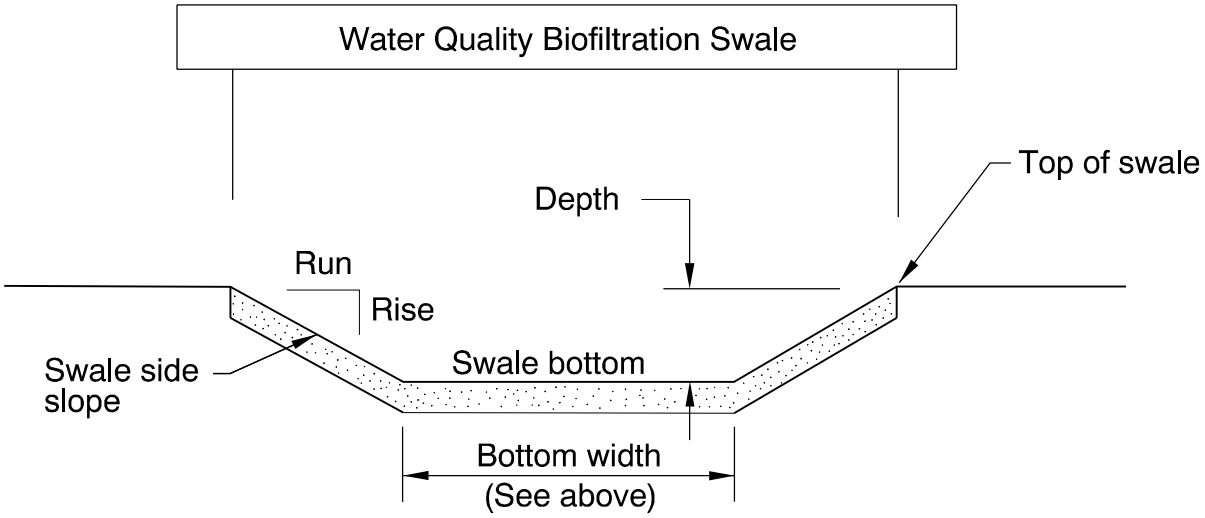
Bottom Length (feet)	Bottom Width (feet)
1008	2-13



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)
Varies	**1**	**3**



Site Specific Information: This facility includes a 6” perforated drain pipe and 6” PVC non-perforated standpipes for cleanout, see sheet 2B-5.

4. Facility Access

Maintenance access to the facility:

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

Figure 3: [looking south]

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
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: N/A	☐	**S19**
Swale Outlet		
Catch basin with grate	☒	**S20**
Outlet Pipe (s)	☒	**S21**
Open channel outlet	☐	**S22**
Auxiliary Outlet: N/A	☐	**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 duty 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

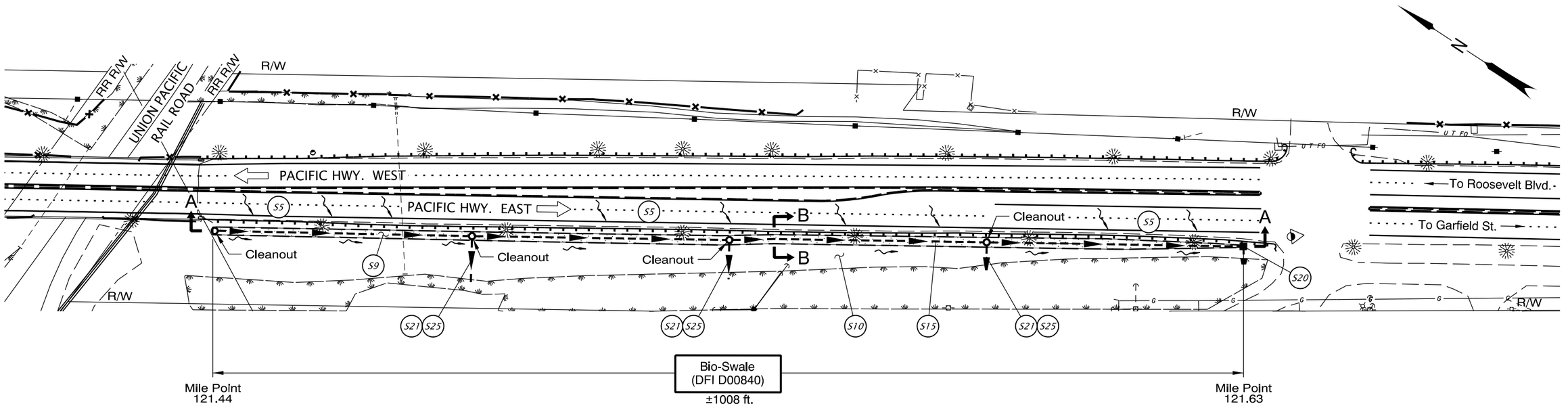
Contact any of the following for more detailed information about management of waste materials found on site:

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

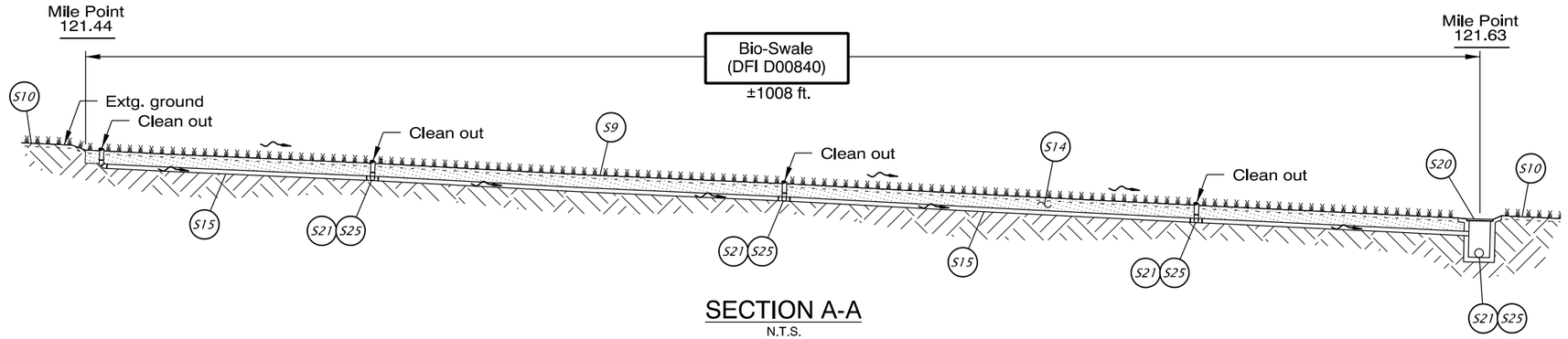
A Appendix A – Site Specific Operational Plan

Contents:

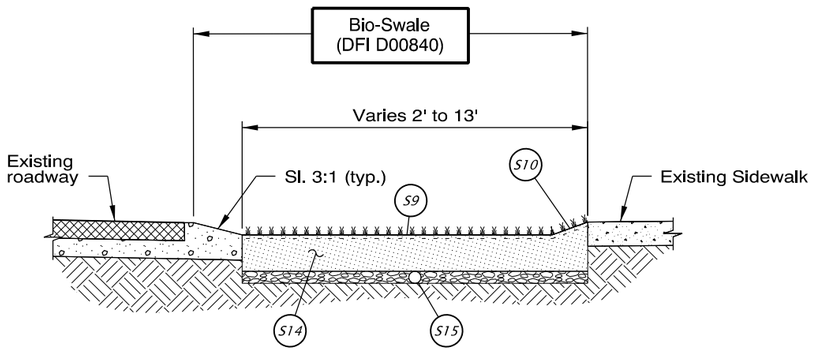
Operational Plan: DFI D00840



PLAN
N.T.S.



SECTION A-A
N.T.S.



SECTION B-B
N.T.S.

LEGEND:

- Photo Location / Direction
- S# — Facility Component (see table 1 in O&M Manual)
- Cleanout
- ■ and/or □ — Inlet
- Storm Pipe (Facility)
- Conveyance Direction
- Pavement / Facility Flow Path

OREGON DEPARTMENT OF TRANSPORTATION

Prepared By: Chris Carman

Drafted By: Michael Skelton

DFI D00840
MAINTENANCE DISTRICT 5 OR99
WATER QUALITY BIOFILTRATION SWALE
PACIFIC HIGHWAY WEST MP 121.44 RT.
LANE COUNTY

D00840.dgn :: D00840 2/26/2019 12:54:05 PM hwye93l

Rotation: 303.2167° Scale: 1"=100'

Contents:

Site Specific Subset of Project Contract Plan 47V-086

47V-086

INDEX OF SHEETS	
SHEET NO.	DESCRIPTION
1	Title Sheet
1A	Index Of Sheets Cont'd. & Std. Drg. Nos.

STATE OF OREGON

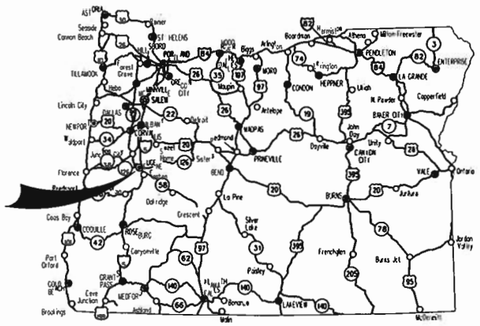
DEPARTMENT OF TRANSPORTATION

PLANS FOR PROPOSED PROJECT

GRADING, DRAINAGE, STRUCTURES, PAVING, & SIGNALS

OR99: ROOSEVELT BLVD - GARFIELD ST
BIKE / PED (EUGENE) SEC.

PACIFIC HIGHWAY WEST
LANE COUNTY
OCTOBER 2014



Overall Length Of Project - 1.11 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.)

LET'S ALL WORK TOGETHER TO MAKE THIS JOB SAFE

BEGINNING OF PROJECT
STA. "L" 616+20 (M.P. 121.14)
STA. "P" 616+20

T. 17 S., R. 4 W., W.M.

REVISED AS CONSTRUCTED
10-15-16 CONTRACT 14706
PROJ. MGR. Steve Templin, P.E.

STA. "L" 642+00 P.O.T.
STA. "SB" 641+99.98, (26' LT.) P.O.B.
STA. "P" 642+05.05, (62.40' LT.) P.O.T.

END OF PROJECT
STA. "SB" 674+96.80 (M.P. 122.25)

OREGON TRANSPORTATION COMMISSION

David Lohman	ACTING CHAIR
Tammy Baney	COMMISSIONER
Mark Frohnmayer	COMMISSIONER
Susan Morgan	COMMISSIONER
Matthew L. Garrett	DIRECTOR OF TRANSPORTATION

PLANS PREPARED FOR
OREGON DEPARTMENT OF TRANSPORTATION

QUINCY ENGINEERING

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

Jeff W. Olson, Principal Engineer
Print name and title

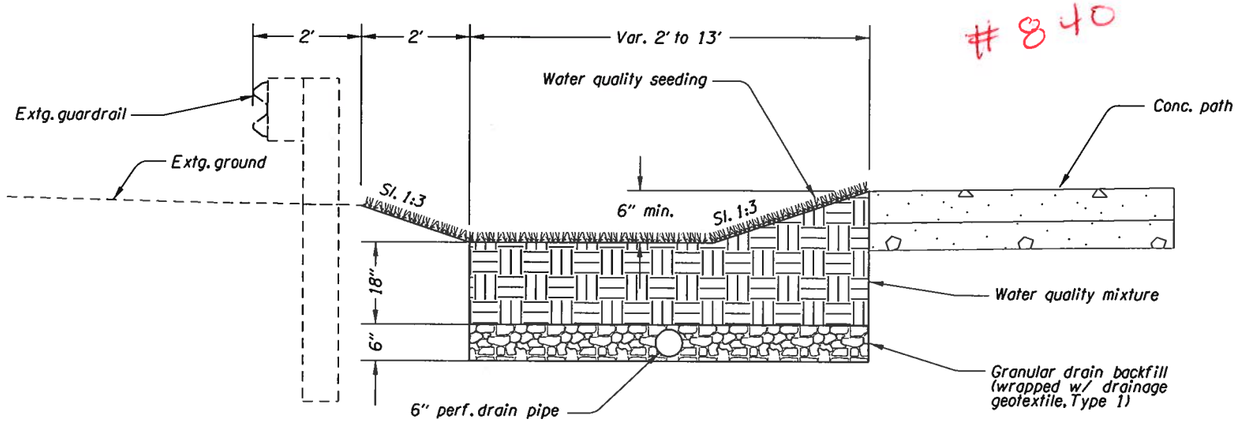
_____
Concurrence by ODOT Chief Engineer

OR99: ROOSEVELT BLVD - GARFIELD ST
BIKE/PED (EUGENE) SEC.
PACIFIC HWY WEST
LANE COUNTY

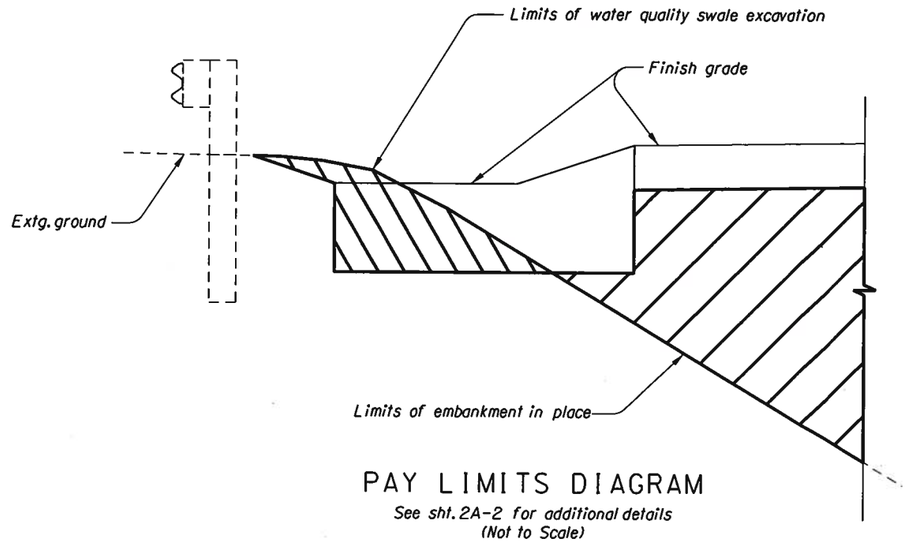
FEDERAL HIGHWAY ADMINISTRATION	PROJECT NUMBER	SHEET NO.
OREGON DIVISION	STP-S091(070)	1

47V-086
REVISED AS CONSTRUCTED
10-15-16 CONTRACT 14706

#839
#840



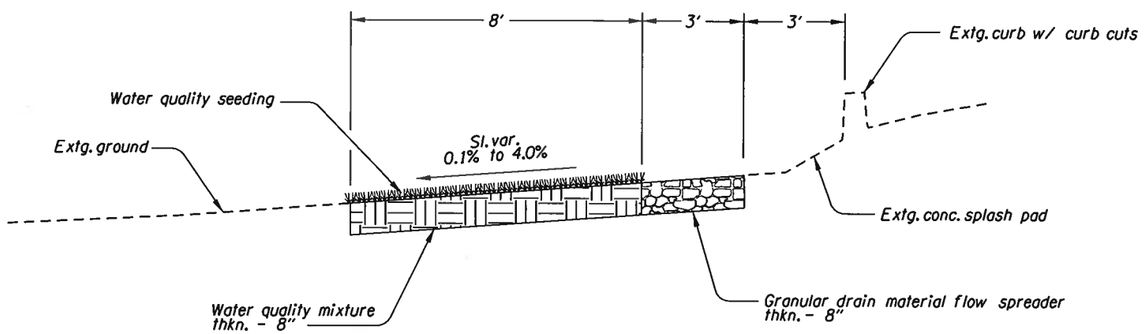
TYPICAL SECTION



PAY LIMITS DIAGRAM
See sht. 2A-2 for additional details
(Not to Scale)

NOTES:
1. See Section 01012 for additional details and requirements.

WATER QUALITY SWALE
See sht. 3B, Note 1 and sht. 6B, Note 1
(Not to Scale)



WATER QUALITY FILTER STRIP
See sht. 9B, Note 7
(Not to Scale)

DFI #841

NOTES:
1. See Section 01014 for additional details and requirements.

REGISTERED PROFESSIONAL ENGINEER
56205PE
OREGON
MAY 13, 2003
RUSSELL W. NORTON
RENEWS: 12-31-2014

OREGON DEPARTMENT OF TRANSPORTATION

QUINCY ENGINEERING

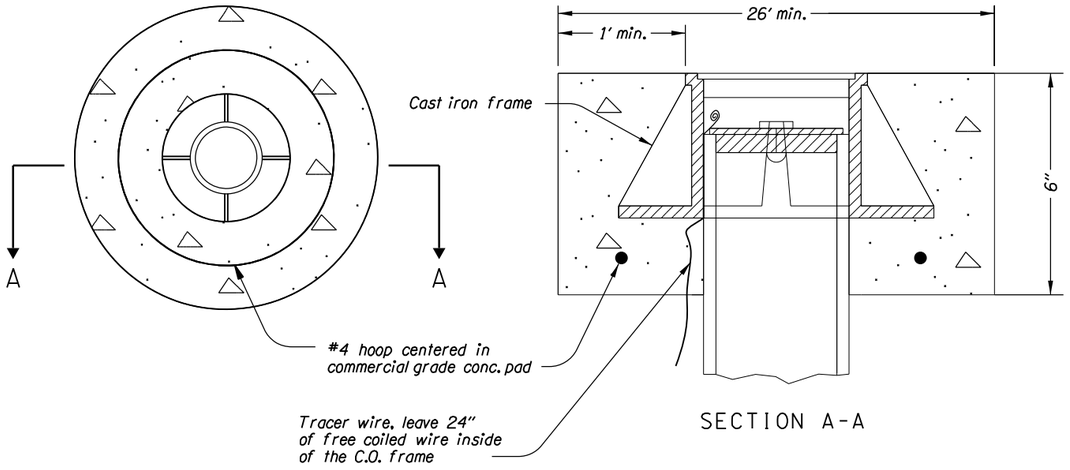
OR99: ROOSEVELT BLVD - GARFIELD ST
BIKE/PED (EUGENE) SEC.
PACIFIC HWY WEST
LANE COUNTY

Design Team Leader - Russell W. Norton
Designed By - Scott D. Robinson-Tscheu
Drafted By - RWN / SDRT

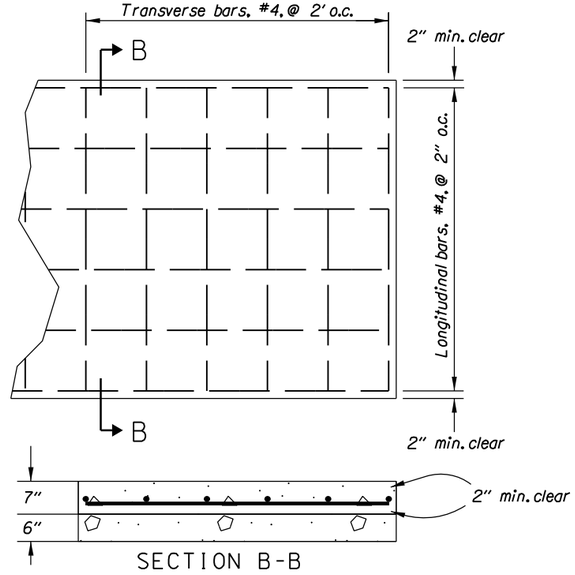
DETAILS

SHEET NO.
2B-2

47V-086
REVISED AS CONSTRUCTED
10-15-16 CONTRACT 14706



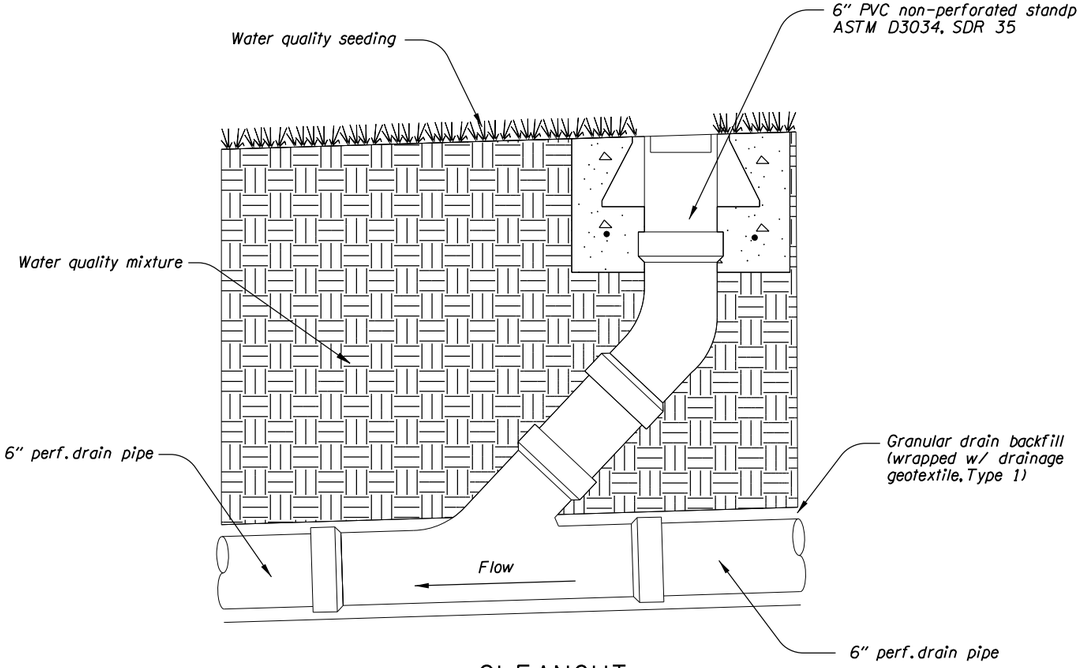
SECTION A-A



SECTION B-B

PCC CONC. WALK, REINFORCED, 7"

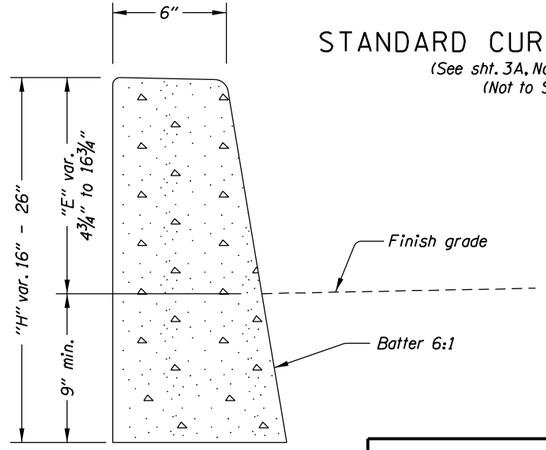
(See sht. 4A, Note 2; and sht. 5A, Note 3)
(Not to Scale)



CLEANOUT

(See sht. 4B, Notes 2 & 4; sht. 5B, Note 2; sht. 6B, Notes 3 & 4; and sht. 7B, Note 2)
(Not to Scale)

NOTES:
1. For Water Quality Swale details, see sht. 2B-2.
2. Etch a "V" into the conc. path pointing toward the cleanout in all locations



STANDARD CURB, MODIFIED

(See sht. 3A, Notes 1 & 2)
(Not to Scale)

NOTES:
1. For details not shown, see Typical Sections and drg. no. RD700.

REGISTERED PROFESSIONAL ENGINEER
56205PE
OREGON
May 13, 2003
RUSSELL W. NORTON
RENEWS: 12-31-2014

OREGON DEPARTMENT OF TRANSPORTATION

QUINCY ENGINEERING

OR99: ROOSEVELT BLVD - GARFIELD ST
BIKE/PED (EUGENE) SEC.
PACIFIC HWY WEST
LANE COUNTY

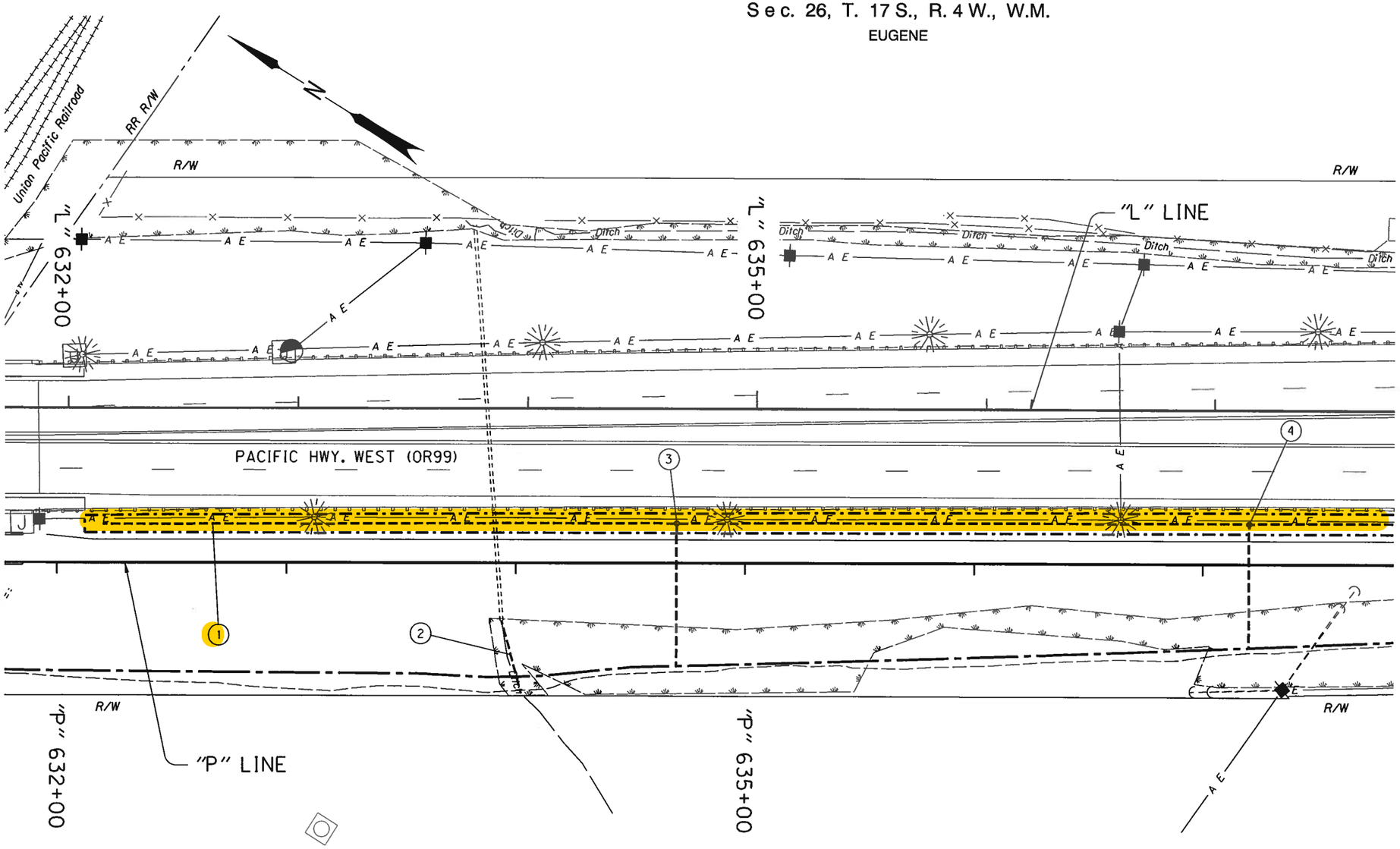
Design Team Leader - Russell W. Norton
Designed By - Scott D. Robinson-Tscheu
Drafted By - RWN / SDRT

DETAILS

SHEET NO. 2B-5

Sec. 26, T. 17 S., R. 4 W., W.M.
EUGENE

47V-086
REVISED AS CONSTRUCTED
10-15-16 CONTRACT 14706



1. Sta. "P" 632+12 to Sta. "P" 642+20
   Const. water quality swale
   DFI No. D00840
   Var. width flat bottom, 1:3 slopes
   (For details, see sht. 2B-2)

2. Sta. "P" 633+94 to Sta. "P" 634+02, Rt.
   Inst. 36" culvert pipe - 34'
   20' depth
   Connect to extg. conc. culvert pipe

3. Sta. "P" 634+70
   Inst. cleanout
   Inst. 6" drain pipe - 62'
   Inst. subsurface drain outlet
   (For details, see sht. 2B-5)

4. Sta. "P" 637+20
   Inst. cleanout
   Inst. 6" drain pipe - 54'
   Inst. subsurface drain outlet

NOTES:
1. Utilities in conflict to be relocated by others prior to construction unless otherwise noted. See Section 00150.50 for details.
2. Field verify elevation call-outs noted with "±".
3. For drainage profile, see sht. 6C.

REGISTERED PROFESSIONAL ENGINEER
56205PE
OREGON
May 13, 2003
RUSSELL W. NORTON
RENEWS: 12-31-2014

OREGON DEPARTMENT OF TRANSPORTATION

QUINCY ENGINEERING

OR99: ROOSEVELT BLVD - GARFIELD ST
BIKE/PED (EUGENE) SEC.
PACIFIC HWY WEST
LANE COUNTY

Design Team Leader - Russell W. Norton
Designed By - Scott D. Robinson-Tscheu
Drafted By - RWN / SDRT

DRAINAGE & UTILITIES

SHEET NO. 6B