

OPERATION & MAINTENANCE MANUAL

DFI No.: D00369

**Facility Type: Water Quality Biofiltration
Swale**



MARCH, 2011

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1. Identification

Drainage Facility ID (DFI): **D00369**
Facility Type: Water Quality Biofiltration Swale
Construction Drawings: (V-File Number) 40V-091
Location: District: 7
Highway No.: 001
Mile Post: 103.86 / 103.95 (beg./end)
Description: This facility is located on the eastern side of I-5 (Hwy 001, Pacific Highway) in the gore area between the Weaver Road off-ramp and I-5. Access can be obtained from the northbound shoulder of I-5 or from the Weaver Road off-ramp.

2. Facility Contact Information

Contact the Engineer of Record, Region Technical Center, or Geo-Environmental's Senior Hydraulics Engineer for:

- Operational clarification
- Maintenance clarification
- Repair or restoration assistance

Engineering Contacts:

Region Technical Center Hydraulics Engineer (541) 957-3693

Or

Geo-Environmental Senior Hydraulics Engineer (503) 986-3365.

3. Construction

Engineer of Record: ODOT Designer – Region 3 Tech. Center, James Kent, P.E., 541-957-3573

Facility construction: 2006
Contractor: Hamilton Construction Company.]

4. Storm Drain System and Facility Overview

A water quality swale is a flat-bottomed open channel designed to treat stormwater runoff from highway pavement areas. This type of facility is lined with grass. Treatment by trapping sedimentation occurs when stormwater runoff flows through the grass.

Stormwater for the facility is conveyed to the facility through a roadside ditch. The ditch collects stormwater from sheet flow generated by the northbound travel lanes of I-5 and the Weaver Road off-ramp. Refer to the Operational Plan in Appendix A for further information. Water conveyed into the swale undergoes treatment as it flows through the length of the channel. The treated water flows out of the swale through an inlet connected to an 18-inch storm pipe. This storm pipe discharges into a roadside ditch north of the Weaver Road overcrossing. The flow from this roadside ditch is conveyed into the South Umpqua River.

A. Maintenance equipment access:

Maintenance crew can access the facility from the northbound shoulder of I-5 or from the Weaver Road off-ramp.

B. Heavy equipment access into facility:

- Allowed (no limitations)
- Allowed (with limitations)
- Not allowed

C. Special Features:

- Amended Soils
- Porous Pavers
- Liners
- Underdrains

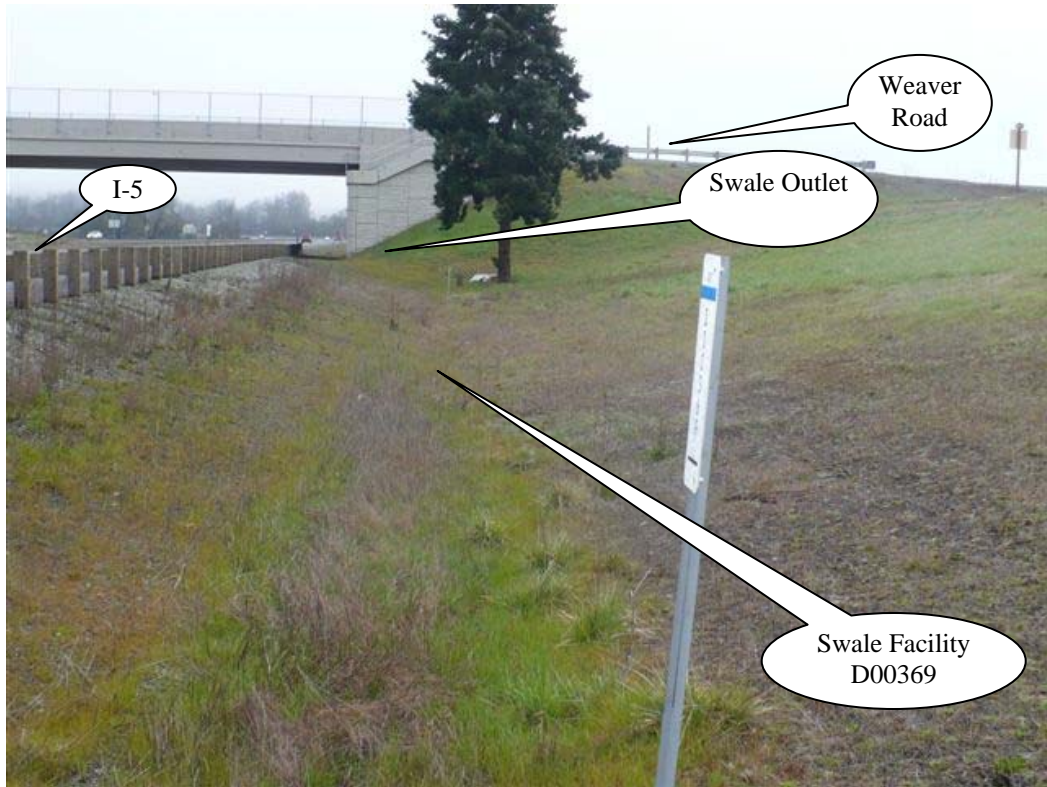


Photo 1: Looking north, flow into the swale is generated from I-5 shown on the left side of the picture and from the Weaver Road NB off-ramp shown in the right side of the picture.

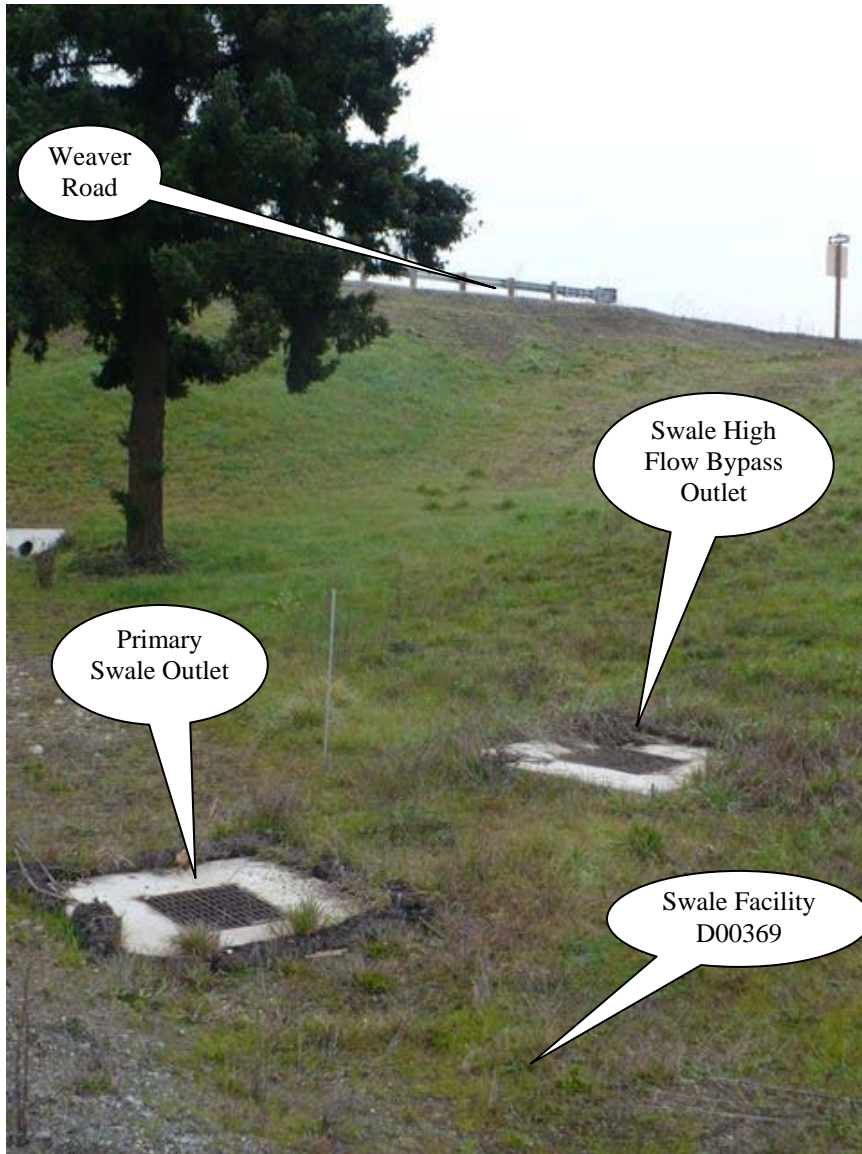


Photo 2: Looking at the facility outlet control structure. Water is conveyed from the primary swale outlet to the high flow bypass outlet, and then routed north under the Weaver road overcrossing via an 18-inch storm pipe.



Photo 3: Looking south, flow into the swale is generated from I-5 shown on the right side of the picture and from the Weaver Road NB off-ramp shown to the left.

5. Facility Haz Mat Spill Feature(s)

The water quality biofiltration swale can be used to store a volume of liquid by blocking the 18-inch diameter outlet pipe located at the outlet of the water quality biofiltration swale. Refer to Photo 2 for a picture of outlet structure.

6. Auxiliary Outlet (High Flow Bypass)

Auxiliary Outlets are provided if the primary outlet control structure can not safely pass the projected high flows. Broad-crested spillway weirs and over flow risers are the two most common auxiliary outlets used in stormwater treatment facility design. The auxiliary outlet feature is either a part of the facility or an additional storm drain feature/structure.

The auxiliary outlet feature for this facility is:

- Designed into facility

A secondary auxiliary inlet/outlet grated catch basin has been designed as part of the facility’s outlet control structure, and acts as an emergency overflow in the event the primary outlet control device is plugged.

Before flows ever reach the higher level of the secondary inlet/outlet device, however, they are typically released through a primary inlet/outlet grated catch basin located below the secondary device. If runoff should ever exceed the water quality event, where flows normally are directed to the lower primary outlet, the pond level will rise and flows will be released through the secondary auxiliary inlet/outlet device located just above the primary outlet.

- Other, as noted below

7. Maintenance Requirements

Routine maintenance table for non-proprietary stormwater treatment and storage/detention facilities have been incorporated into ODOT's Maintenance Guide. These tables summarize the maintenance requirements for ponds, swales, filter strips, bioslopes, and detention tanks and vaults. Special maintenance requirements in addition to the routine requirements are noted below when applicable.

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

<http://www.oregon.gov/ODOT/HWY/OOM/MGuide.shtml>

Maintenance requirements for proprietary structures, such as underground water quality manholes and/or vaults with filter media are noted in Appendix C when applicable.

The following stormwater facility maintenance table (See ODOT Maintenance Guide) should be used to maintain the facility outlined in this Operation and Maintenance Manual or follow the Maintenance requirements outlined in Appendix C when proprietary structure is selected below:

- Table 1 (general maintenance)
- Table 2 (stormwater ponds)
- Table 3 (water quality biofiltration swales)
- Table 4 (water quality filter strips)
- Table 5 (water quality bioslopes)
- Table 6 (detention tank)
- Table 7 (detention vault)
- Appendix C (proprietary structure)
- Special Maintenance requirements:

Note: Special maintenance Requirements Require Concurrence from ODOT SR Hydraulics Engineer.

8. Waste Material Handling

Material removed from the facility is defined as waste by DEQ. Refer to the roadwaste section of the ODOT Maintenance Yard Environmental Management System (EMS) Policy and Procedures Manual for disposal options: <http://egov.oregon.gov/ODOT/HWY/OOM/EMS.shtml>

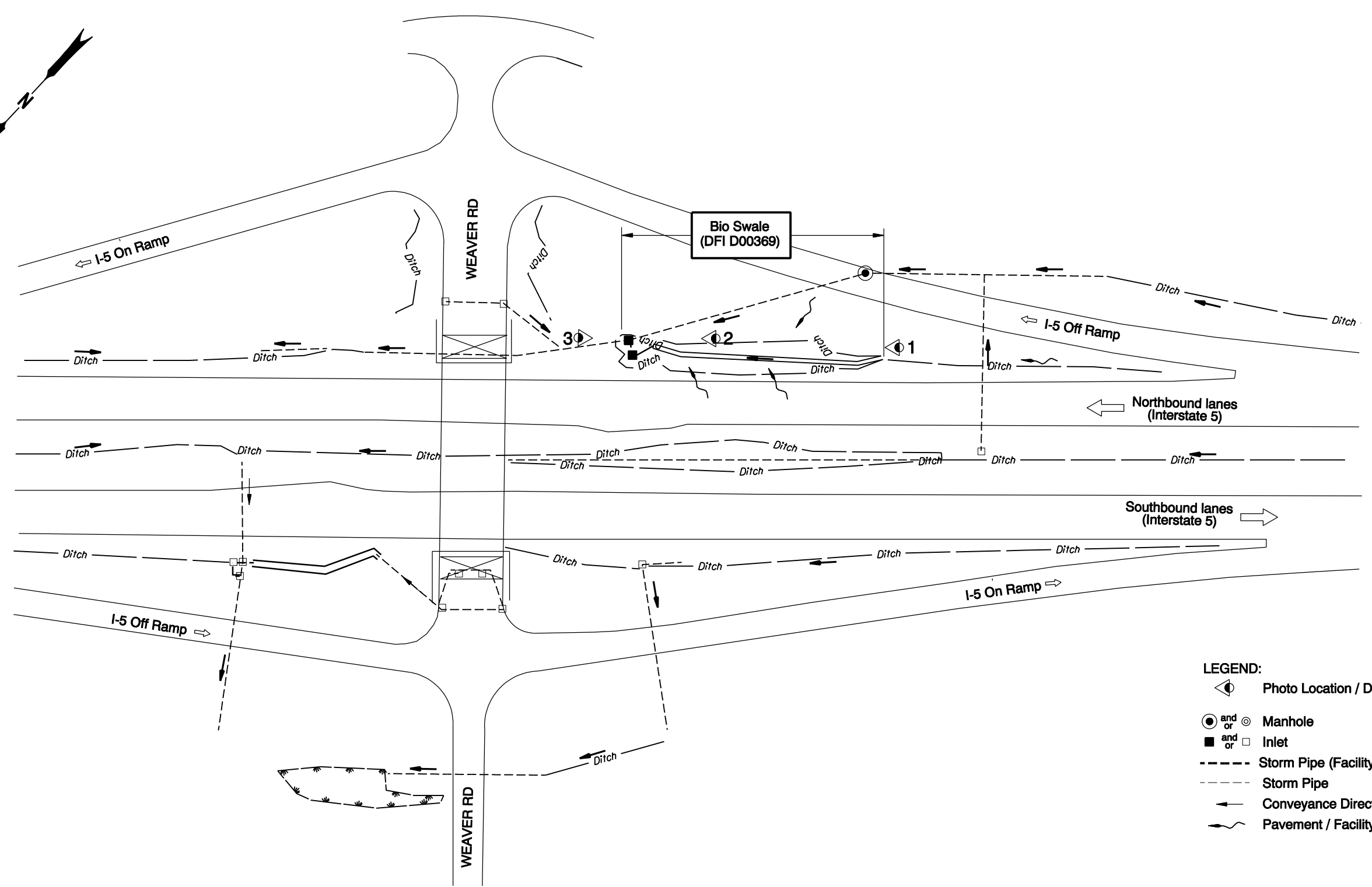
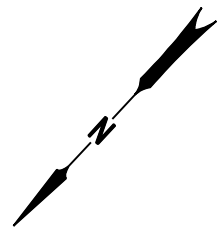
Contact any of the following for more detailed information about management of waste materials found on site:

ODOT Clean Water Unit	(503) 986-3008
ODOT Statewide Hazmat Coordinator	(503) 229-5129
ODOT Region Hazmat Coordinator	(541) 957-3594
ODEQ Northwest Region Office	(503) 229-5263

Appendix A

Content:

- **Operational Plan and Profile Drawing(s)**

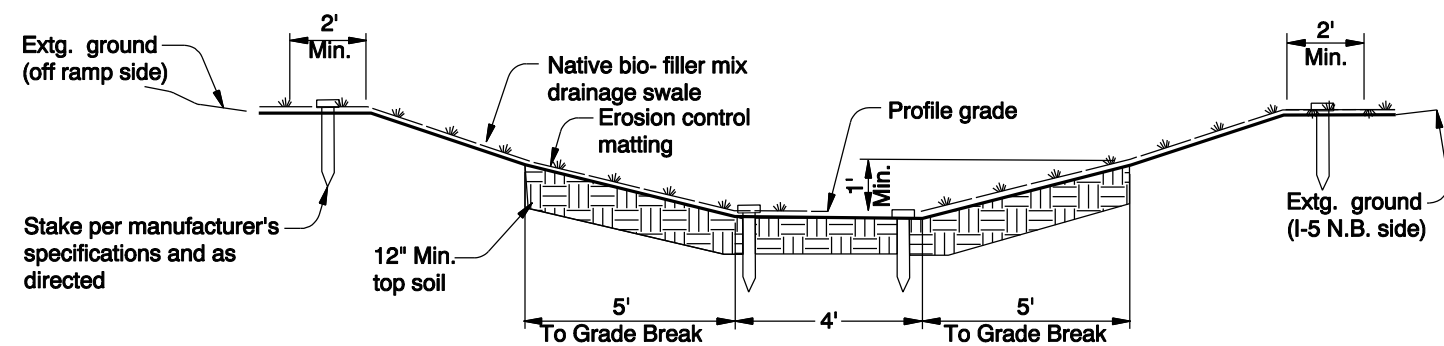
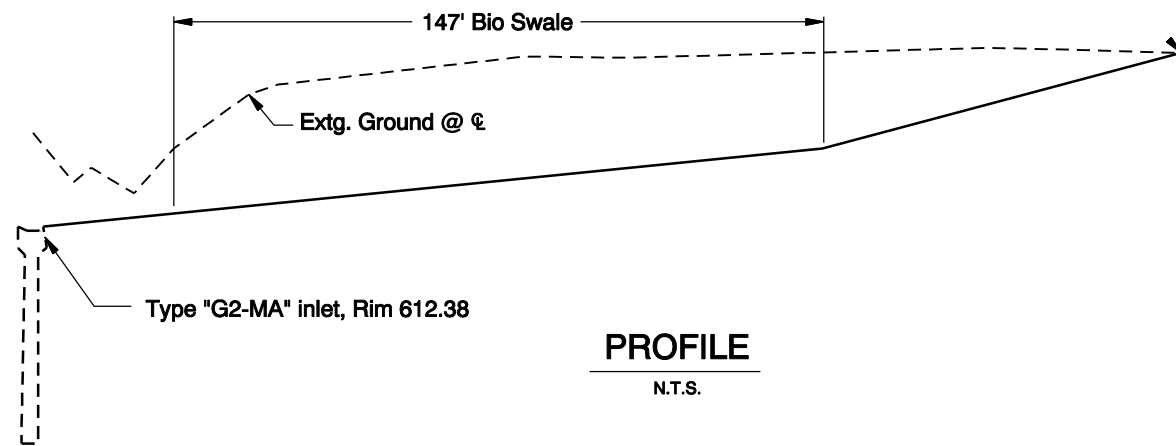
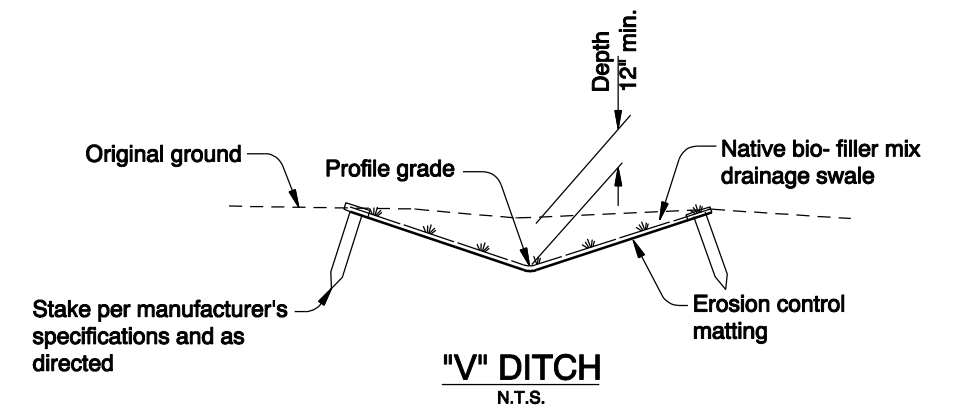
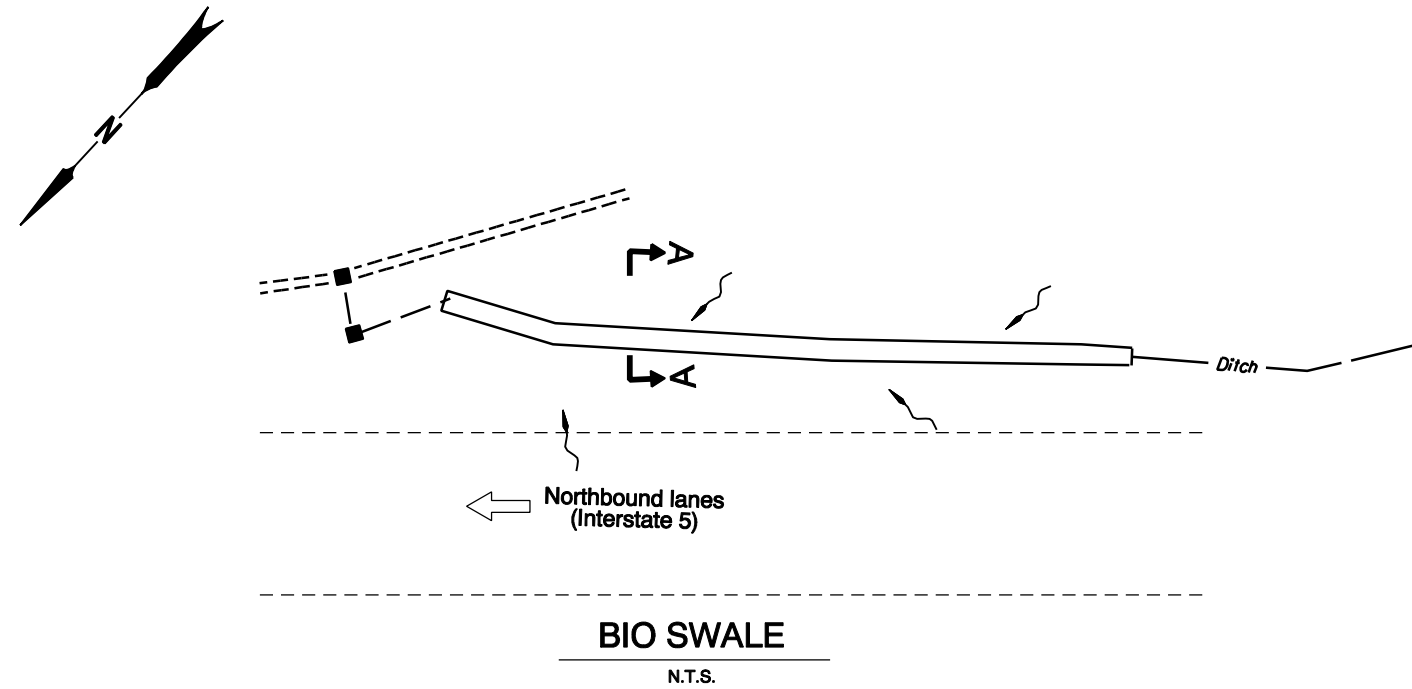


- LEGEND:**
- Photo Location / Direction
 - and Manhole
 - and Inlet
 - Storm Pipe (Facility)
 - Storm Pipe
 - Conveyance Direction
 - Pavement / Facility Flow Path

OREGON DEPARTMENT OF TRANSPORTATION

Prepared By: J. Carpenter
 Drafted By: B. Shafer

DFI D00369
MAINTENANCE DISTRICT 7 HWY 001
WATER QUALITY BIOFILTRATION SWALE
 PACIFIC HIGHWAY MP 103.86/103.95
 DOUGLAS COUNTY



 OREGON DEPARTMENT OF TRANSPORTATION

Prepared By: J. Carpenter

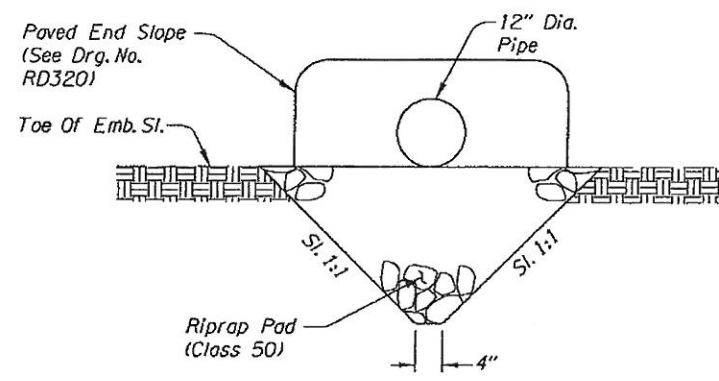
Drafted By: B. Shafer

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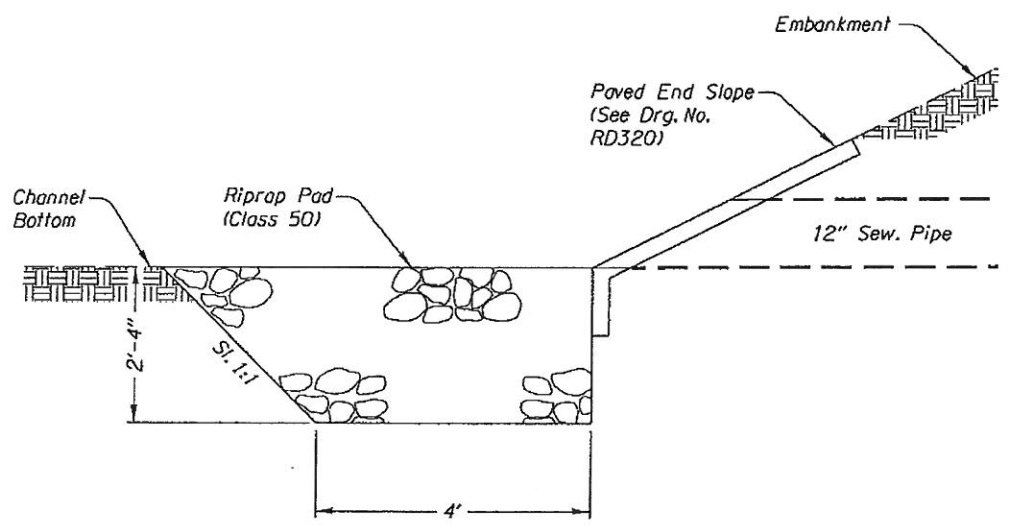
Appendix B

Content:

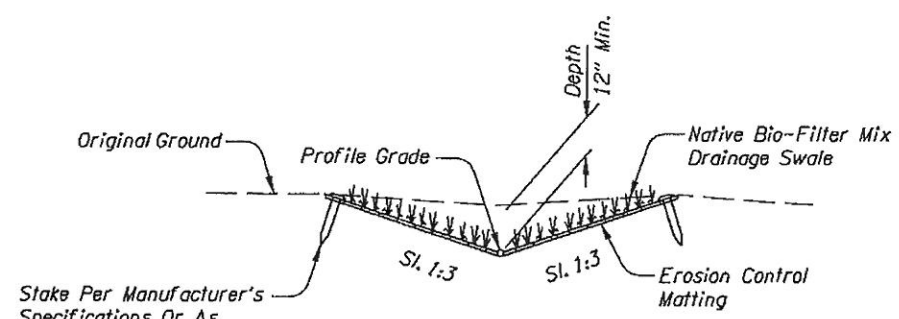
- **ODOT Project Plan Sheets**
 - *Cover/Title Sheet*
 - *Water Quality/Detention Plan Sheets*
 - *Other Details*



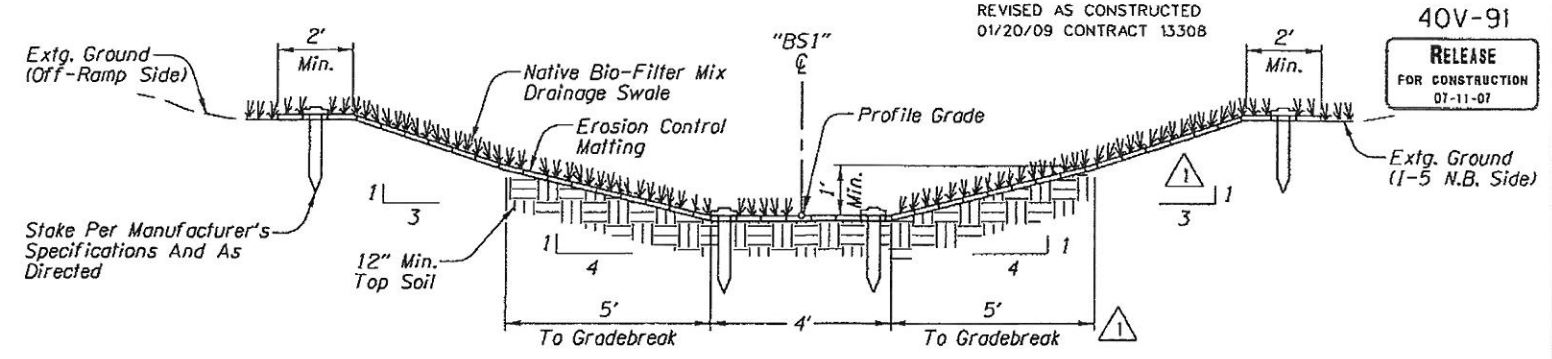
FRONT VIEW



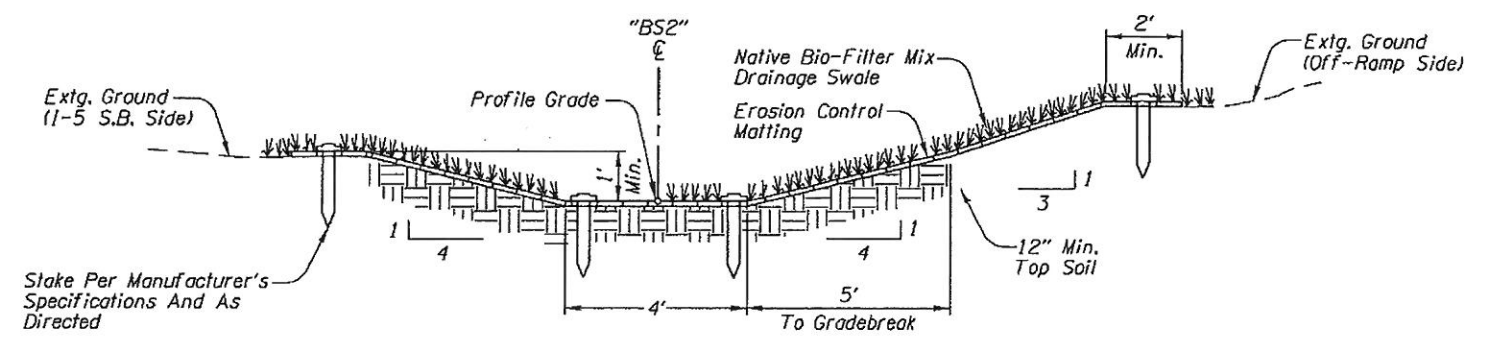
SIDE VIEW
RIPRAP PAD
(With Paved End Slope)



"V" DITCH
(See Sht. 2B-11 For Plan And Profile)

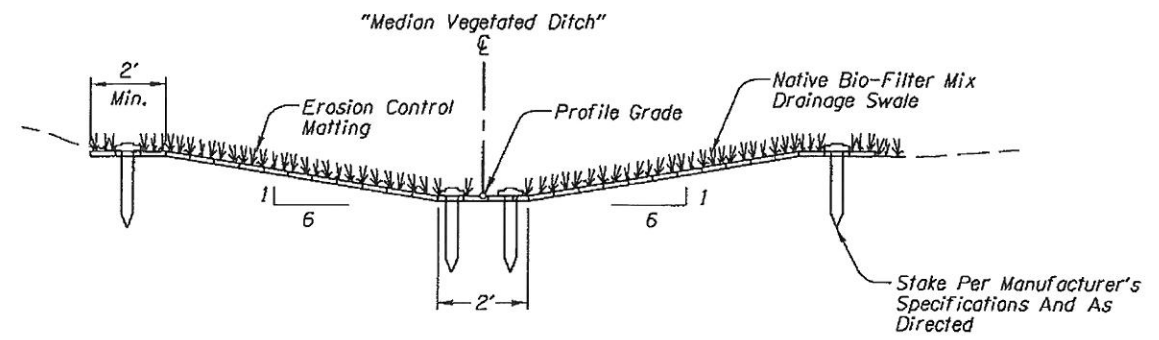


SECTION A-A
BIO-SWALE NO. 1



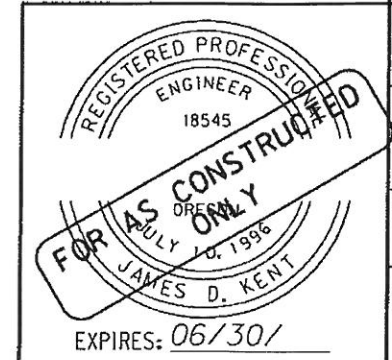
SECTION A-A
BIO-SWALE NO. 2

NOTE:
1. For Details, See Sht. 2B-11 & Sht. 3B.

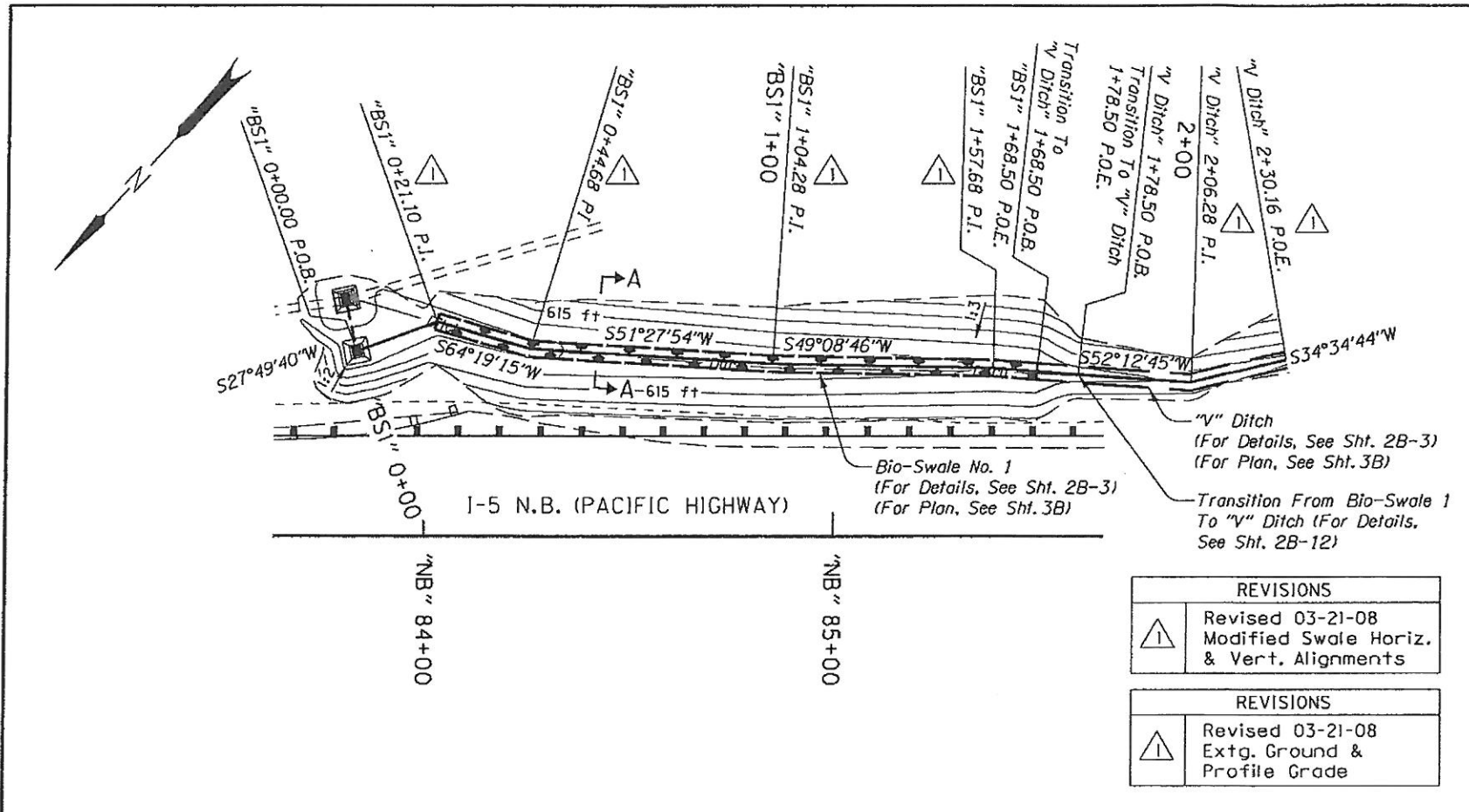


MEDIAN VEGETATED DITCH
(See Sht. 2B-13 For Plan And Profile)

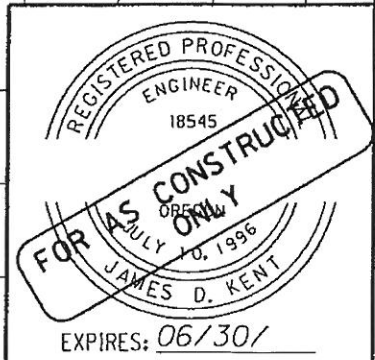
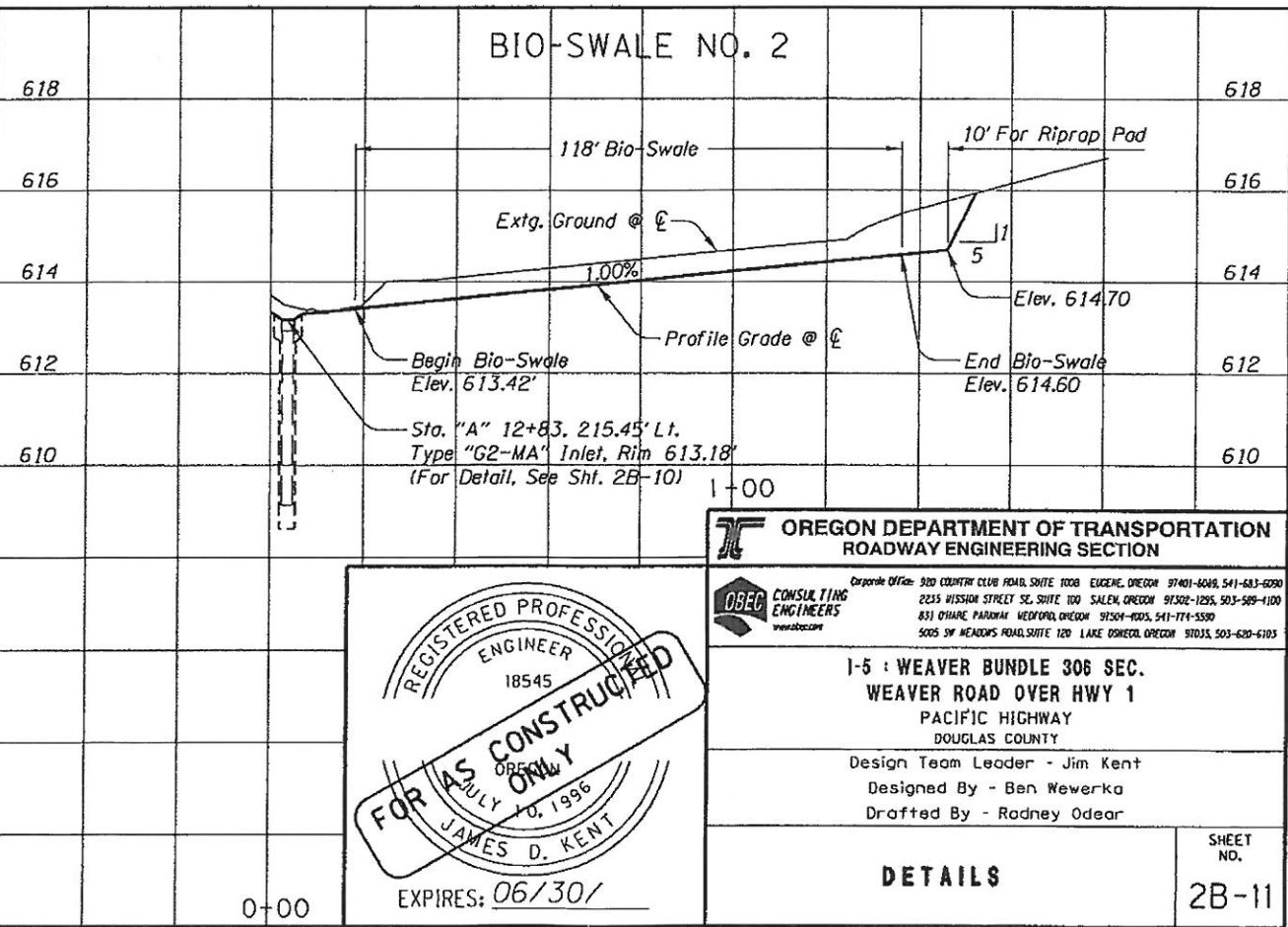
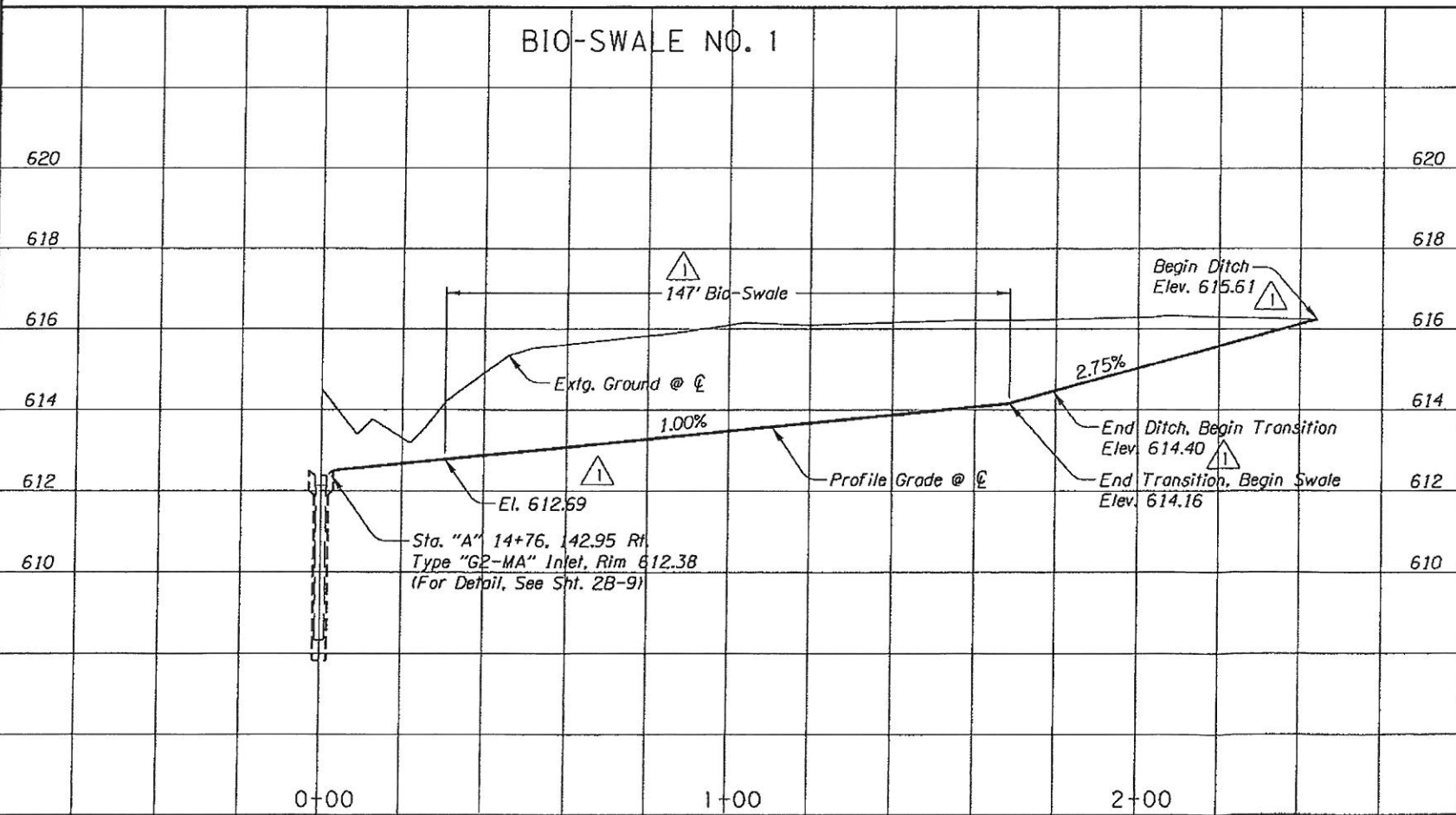
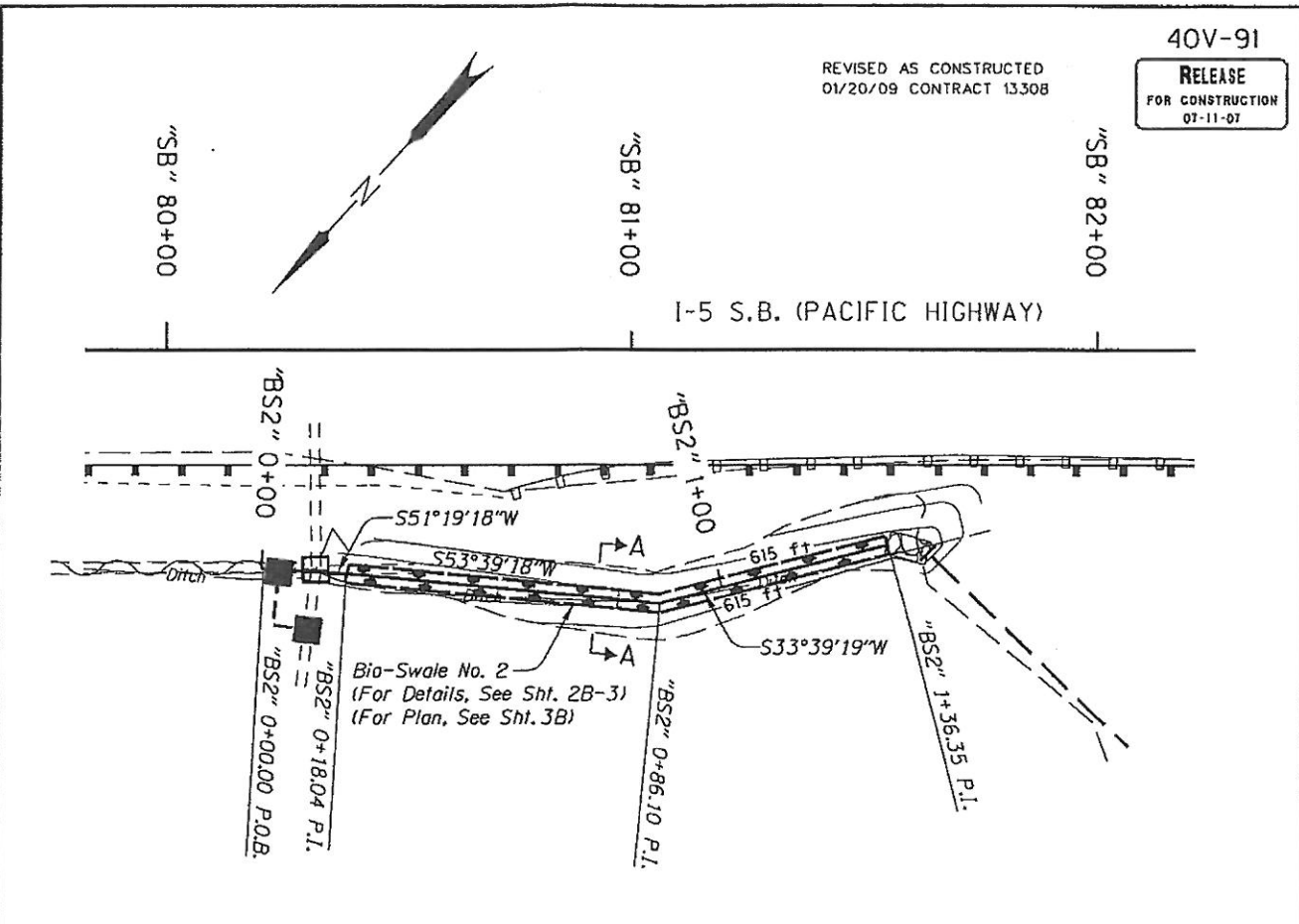
REVISIONS	
⚠	Revised 03-21-08 Modified Swale Section



OREGON DEPARTMENT OF TRANSPORTATION ROADWAY ENGINEERING SECTION	
<small>Corporate Office: 920 COURTNEY CLUB ROAD, SUITE 100B EUGENE, OREGON 97401-6004, 541-683-6200 2225 MISSION STREET SE, SUITE 100 SALEM, OREGON 97302-1295, 503-589-4100 831 O'HARE PARKWAY NE, SUITE 100 PORTLAND, OREGON 97208-4005, 541-774-5500 5005 SW WENDERS ROAD, SUITE 120 LAKE OSWEGO, OREGON 97035, 503-620-6403</small>	
1-5 : WEAVER BUNDLE 306 SEC. WEAVER ROAD OVER HWY 1 PACIFIC HIGHWAY DOUGLAS COUNTY	
Design Team Leader - Jim Kent Designed By - Ben Wewerka Drafted By - Rodney Odear	
DETAILS	SHEET NO. 2B-3



REVISIONS	
△	Revised 03-21-08 Modified Swale Horiz. & Vert. Alignments
REVISIONS	
△	Revised 03-21-08 Extg. Ground & Profile Grade



OREGON DEPARTMENT OF TRANSPORTATION
ROADWAY ENGINEERING SECTION

Corporate Office: 900 CENTER CLUB ROAD, SUITE 1000 EUGENE, OREGON 97401-6248, 541-683-6200
2235 HISSON STREET SE, SUITE 100 SALEM, OREGON 97302-1295, 503-589-1100
431 O'HARE PARKWAY, MEDFORD, OREGON 97504-6005, 541-774-5500
5005 SW MEADOWS ROAD, SUITE 120 LAKE OSWEGO, OREGON 97035, 503-639-6105

OBEC CONSULTING ENGINEERS
www.obec.com

1-5 : WEAVER BUNDLE 306 SEC.
WEAVER ROAD OVER HWY 1
PACIFIC HIGHWAY
DOUGLAS COUNTY

Design Team Leader - Jim Kent
Designed By - Ben Wewerka
Drafted By - Rodney Odear

DETAILS

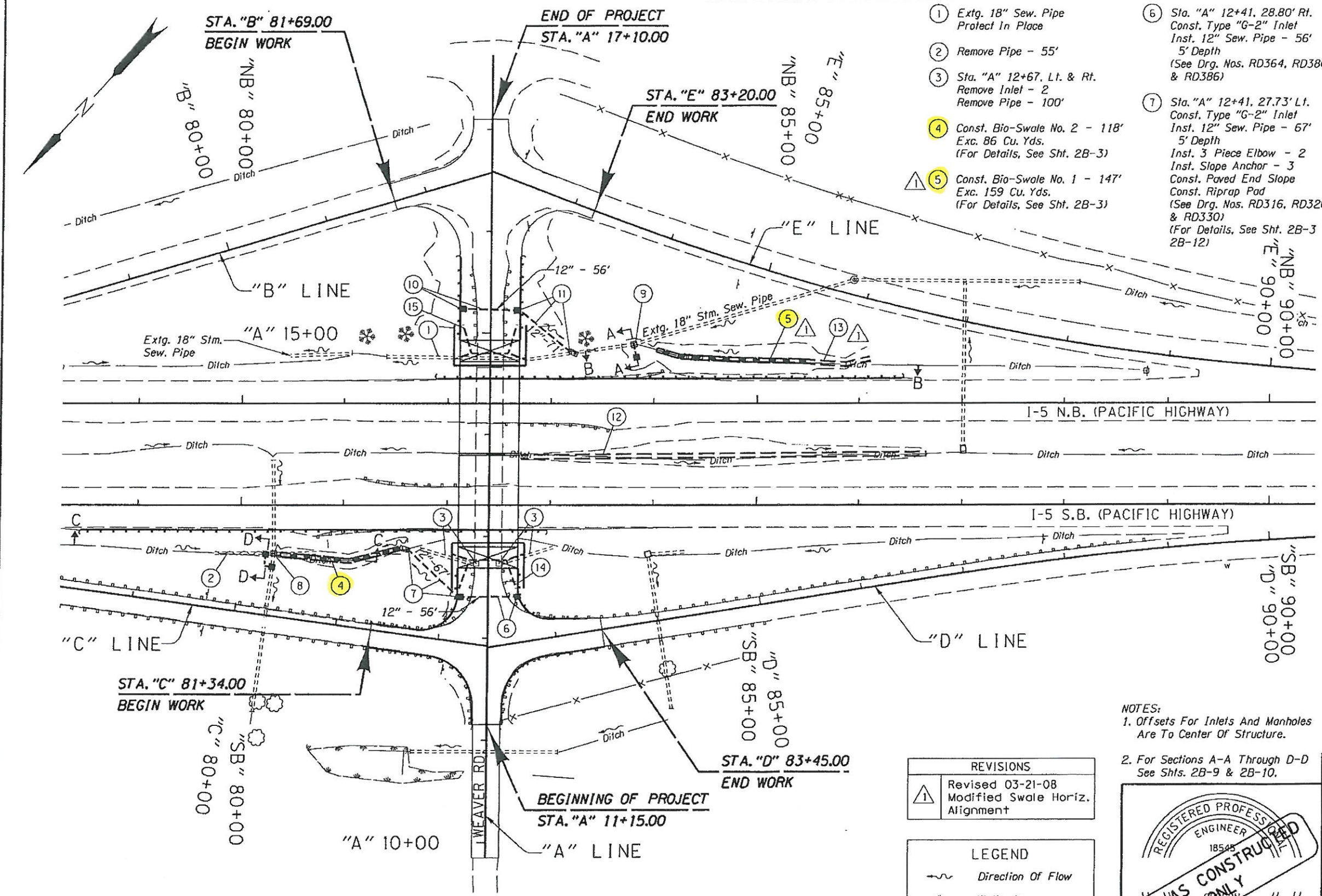
SHEET NO. **2B-11**

Sec. 32, T. 29 S., R. 5 W., W.M.
WEAVER ROAD OVERCROSSING

REVISED AS CONSTRUCTED
01/20/09 CONTRACT 13308

40V-91

RELEASE
FOR CONSTRUCTION
01-11-07



- ① Extg. 18" Sew. Pipe
Protect In Place
- ② Remove Pipe - 55'
- ③ Sta. "A" 12+67, Lt. & Rt.
Remove Inlet - 2
Remove Pipe - 100'
- ④ Const. Bio-Swale No. 2 - 118'
Exc. 86 Cu. Yds.
(For Details, See Sht. 2B-3)
- ⑤ Const. Bio-Swale No. 1 - 147'
Exc. 159 Cu. Yds.
(For Details, See Sht. 2B-3)
- ⑥ Sta. "A" 12+41, 28.80' Rt.
Const. Type "G-2" Inlet
Inst. 12" Sew. Pipe - 56'
5' Depth
(See Drg. Nos. RD364, RD380
& RD386)
- ⑦ Sta. "A" 12+41, 27.73' Lt.
Const. Type "G-2" Inlet
Inst. 12" Sew. Pipe - 67'
5' Depth
Inst. 3 Piece Elbow - 2
Inst. Slope Anchor - 3
Const. Paved End Slope
Const. Riprap Pad
(See Drg. Nos. RD316, RD320
& RD330)
(For Details, See Sht. 2B-3
2B-12)

- ⑧ Sta. "A" 12+70, 209.12' Lt.
SWM #4
Cap Inlet
Const. Type "G2-MA" Inlet
Const. Mod. "G2-MA" Inlet
Inst. 6" Sew. Pipe - 18'
5' Depth
(See Drg. No. RD376)
(For Details, See Sht. 2B-10)
- ⑨ Sta. "A" 14+89, 140.20' Rt.
SWM #3
Reconstruct Inlet W/ G2-MA Top
Const. Type "G2-MA" Inlet
Inst. 6" Sew. Pipe - 12'
5' Depth
(For Details, See Sht. 2B-9)
- ⑩ Sta. "A" 15+23, 27.73' Lt.
Const. Type "G-2" Inlet
Inst. 12" Sew. Pipe - 56'
5' Depth
- ⑪ Sta. "A" 15+23, 27.73' Rt.
Const. Type "G-2" Inlet
Inst. 12" Sew. Pipe - 71'
5' Depth
Inst. 3 Piece Elbow - 2
Inst. Slope Anchor - 3
Const. Paved End Slope
Const. Riprap Pad
(For Details, See Sht. 2B-3 & 2B-12)
- ⑫ Sta. "A" 13+78, 31.00' Rt.
Const. Vegetated Ditch - 394'
2' Flat Bottom, 1:6 Slopes
Dt. Exc. - 137 Cu. Yds.
(For Details, See Sht. 2B-3)
- ⑬ Sta. "A" 14+75, 309' Rt.
Const. Ditch - 63'
"V" Bottom, 1:3 Slopes
Dt. Exc. - 19 Cu. Yds.
(For Details, See Sht. 2B-3)
- ⑭ Sta. "A" 12+77, Lt. & Rt.
Inst. 4" Drain Pipe - 131'
(For Detail See Wall Drgs.)
- ⑮ Sta. "A" 14+80, Lt. & Rt.
Inst. 4" Drain Pipe - 131'
(For Detail See Wall Drgs.)

NOTES:
1. Offsets For Inlets And Manholes
Are To Center Of Structure.
2. For Sections A-A Through D-D
See Shts. 2B-9 & 2B-10.

REVISIONS	
①	Revised 03-21-08 Modified Swale Horiz. Alignment

LEGEND	
	Direction Of Flow
	Wetlands
	Bio-Swale
	Limits Of Cut

REGISTERED PROFESSIONAL ENGINEER
18545
FOR AS CONSTRUCTED ONLY
JULY 10, 1996
JAMES D. KENT
EXPIRES: 06/30/

**OREGON DEPARTMENT OF TRANSPORTATION
ROADWAY ENGINEERING SECTION**

OBEC CONSULTING ENGINEERS
www.obec.com

Office: 920 COUNTRY CLUB ROAD, SUITE 100B EUGENE, OREGON 97401-6009, 541-683-6250
2235 MISSION STREET, SE, SUITE 100 SALLEE, OREGON 97136-1255, 503-589-4100
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5005 SW WEAVER ROAD, SUITE 120 LAKE OSWEGO, OREGON 97035, 503-620-6183

**I-5 : WEAVER BUNDLE 308 SEC.
WEAVER ROAD OVER HWY 1
PACIFIC HIGHWAY
DOUGLAS COUNTY**

Design Team Leader - Jim Kent
Designed By - Ben Wewerka
Drafted By - Rodney Odear

DRAINAGE PLAN

SHEET NO.
3B