OPERATION & MAINTENANCE MANUAL

DFI No. : D00557
Facility Type: Water Quality Biofiltration Swale

JULY, 2018

INDEX

1. Identification

Drainage Facility ID (DFI):	**D00557**
Facility Type:	Water Quality Biofiltration Swale
Construction Drawings:	45V-066
Location:	District: 07
	Highway No.: 138
	Mile Post: 28.15; 28.05 (beg./end)
	Description: This facility is located on the north side of westbound OR 138. Access to the facility can be obtained along the shoulder of westbound OR 138.

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 Hydro Unit Manager

Or

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

3. Construction

Engineer of Record: Stephanie Quellette – Region 3 Tech Center

Facility construction: 2013
Contractor: N/A

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.

This facility is located along the westbound lane of OR 138 (No. 138). Access for this facility is available from the north shoulder of westbound OR 138. Stormwater enters the facility via roadway runoff and a drainage ditch located along the north side of westbound OR 138. As the water flows west it is treated as it slows and spreads out within the swale before outfalling into an existing ditch.

A. Maintenance equipment access:
   This facility can be accessed from the westbound OR 138 (Hwy 138) shoulder.

B. Heavy equipment access into facility:

   ☐ Allowed (no limitations)
   ☒ Allowed (with limitations)
   ☐ Not allowed

C. Special Features:

   ☒ Amended Soils
   ☐ Porous Pavers
   ☒ Liners
   ☐ Underdrains

5. Facility Haz Mat Spill Feature(s)

The water quality biofiltration swale can be used to store a volume of liquid by blocking the facility outlet through use of sandbags.

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

☒ Other
There are no auxiliary outlets built into this facility. In the event that flows exceed design flows the water will overtop the swale.

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 the Department of Environment 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

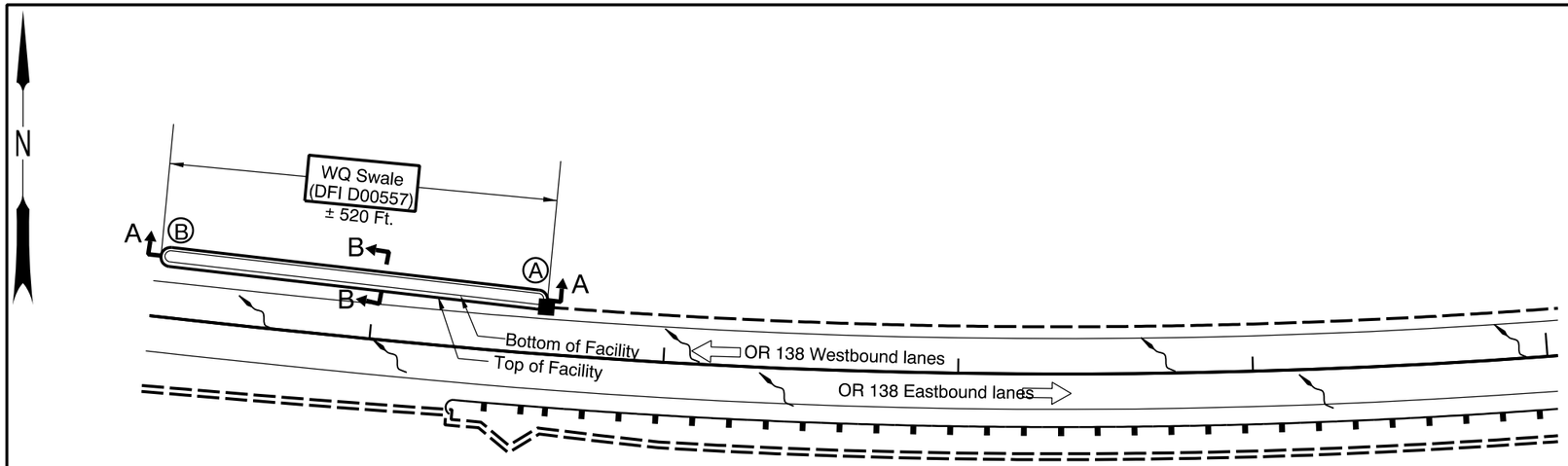
Contact any of the following for more detailed information about management of waste materials found on site:

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

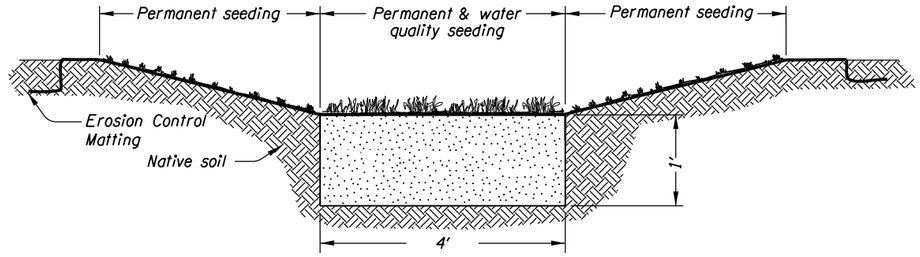
Appendix A

Content:

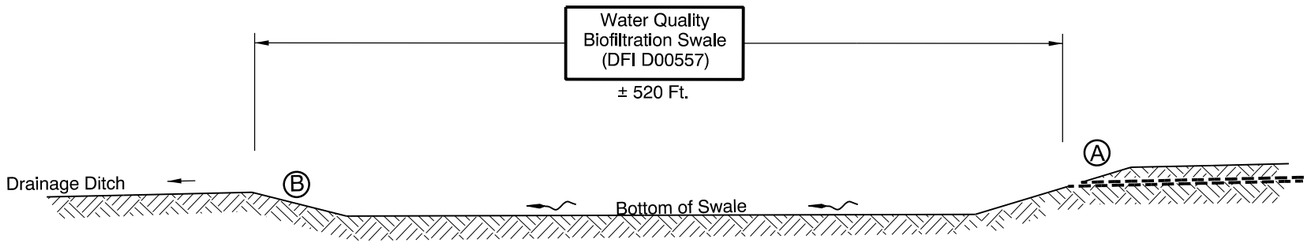
- **Operational Plan and Profile Drawing(s)**



PLAN
N.T.S.



SECTION B-B
N.T.S.



SECTION A-A
N.T.S.

LEGEND:
- Ⓐ Swale Inlet
- Ⓑ Swale Outlet
- ■ and/or □ Inlet
- ▬ ▬ Storm Pipe (Facility)
- ┄ ┄ ┄ Storm Pipe
- ← Conveyance Direction
- ~ Pavement / Facility Flow Path

OREGON DEPARTMENT OF TRANSPORTATION

Prepared By: T. Burrier

Drafted By: T. Burrier

DFI D00557
MAINTENANCE DISTRICT 8 HWY 138
WQ BIOFILTRATION SWALE
HIGHWAY MP 28.05 to MP 28.15
DOUGLAS COUNTY

Appendix B

Content:

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

45V-066

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

STATE OF OREGON

DEPARTMENT OF TRANSPORTATION

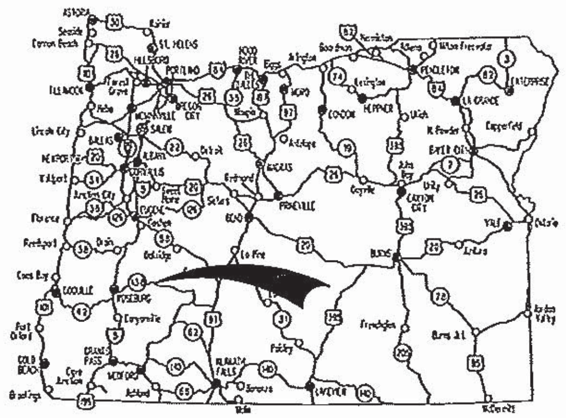
PLANS FOR PROPOSED PROJECT

GRADING, STRUCTURES, & PAVING

OR138E: TIOGA BR, TRAIL& SUSAN CR-STEAMBOAT PAVE

NORTH UMPQUA HIGHWAY

DOUGLAS COUNTY
APRIL 2012

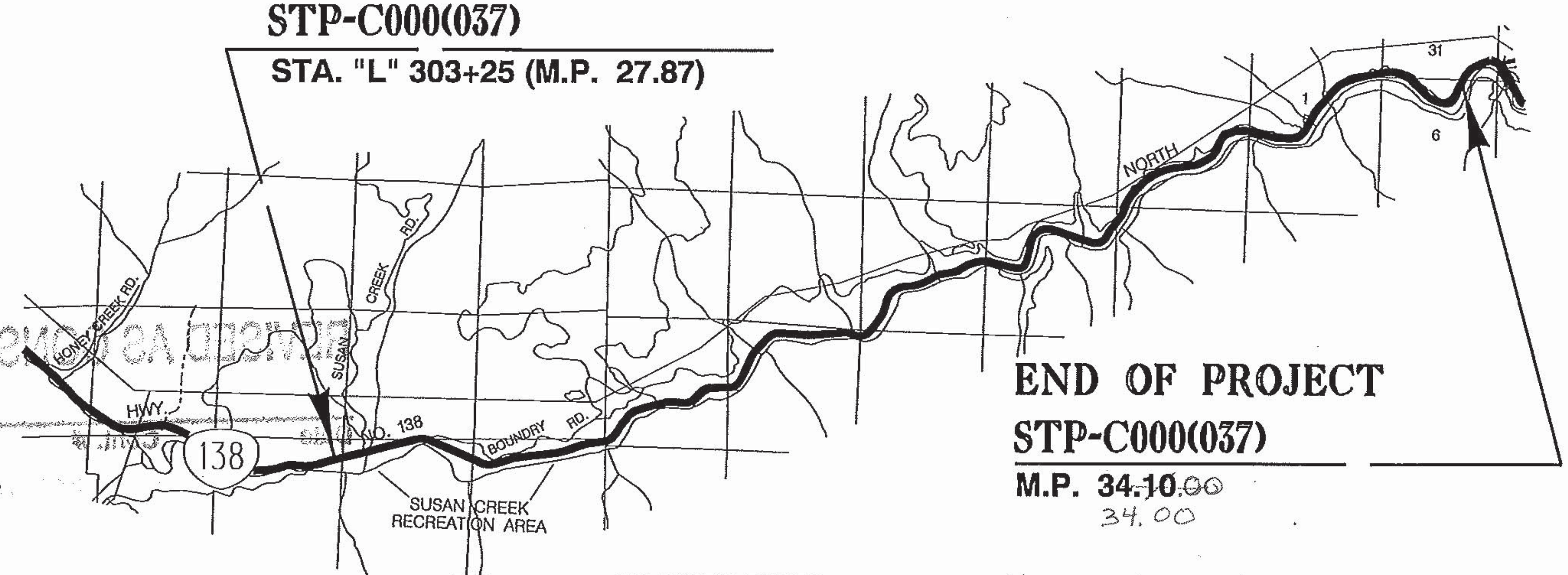


Overall Length Of Project – 10.8 Miles

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
STP-C000(037)
STA. "L" 303+25 (M.P. 27.87)



END OF PROJECT
STP-C000(037)
M.P. 34.10.00
34.00

NO WORK ZONES
M.P. 28.18 ("L" 320+65) - M.P. 28.53
M.P. 29.58 - M.P. 29.63

T. 26 S., R. 2 W., W.M.
T. 25.5 S., R. 1 E., W.M.

REVISED AS CONSTRUCTED
Project Manager
Date 1/7/13 Cont. #
JAN 3 2013 C14440

OREGON TRANSPORTATION COMMISSION

Pat Egan	CHAIR
David Lohman	COMMISSIONER
Mary F. Olson	COMMISSIONER
Mark Frohnmayer	COMMISSIONER
Tommy Boney	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 & date 3-1-2012
Mark Thompson, Rg. 3 Tech. Ctr. Mgr.
Print name and title
Concurrence by ODOT Chief Engineer

OR138E: TIOGA BR, TRAIL& SUSAN CR-STEAMBOAT PAVE
NORTH UMPQUA HIGHWAY
DOUGLAS COUNTY

FEDERAL HIGHWAY ADMINISTRATION	PROJECT NUMBER	SHEET NO.
OREGON DIVISION	STP-C000(037)	1

INDEX OF SHEETS, CONT'D.	
SHEET NO.	DESCRIPTION
1C	Survey Control Sheet
2 & 2A	Typical Sections
2B & 2B-3	Details
2C thru 2C-5	Traffic Control Plans
2D	Pipe Data Sheet
3	General Construction
3A	Profile
4	General Construction

GEO/HYDRO	
GA & GA-2	Erosion Control Plans
GC-1	Plan and Elevation (Retaining Wall #21710)

DRAWING NO.	DESCRIPTION
21486 BRIDGE	
88151	Plan and Elevation
88152	Staging Details
88153	Foundation Data
88154	Bent 1 Plan & Elevation
88155	Bent 2 & 3 Plan & Elevation
88156	Bent 2 & 3 Details
88157	Bent 4 Plan & Elevation
88158	Bent 4 Details
88159	Access Ramp Plan & Elevation
88160	Access Ramp Details
88161	Surface Finish

PERMANENT SIGNS	
S13009	Signing Plan
S13010	Signing Details
S13011	Sign and Post Data Table

Standard Dwg. Nos.

RD300	- Trench Backfill, Bedding, Pipe Zone And Mult. Installations
RD312	- Subsurface Drain
RD317	- Culvert Embankment Protection
RD318	- Sloped Ends For Concrete Pipe
RD326	- Coupling Bands For Corrugated Metal Pipe
RD364	- Concrete Inlets
RD376	- Miscellaneous Drainage Structures
RD380, RD386, RD388	- Pipe Fill Height Tables
RD400, RD405, RD415, RD420,	- Guardrail
RD610	- Asphalt Pavement Details
RD700	- Curbs
RD1005	- Check Dams
RD1015	- Inlet Protection
RD1040	- Sediment Fence
RD1055	- Matting
BR720	- Standard Gravity Retaining Wall Details
TM200	- Sign Installation Details
TM201	- Miscellaneous Sign Placement Details
TM221, TM222	- Milepost Marker Details
TM223	- Directional Sign Layout
TM230, TM233	- Mounting Details For Removable Legend
TM602	- Triangular Base Breakaway Multi-Direction Slip Base
TM635	- Breakaway Sign & Luminaire Supports
TM670	- Wood Post Sign Supports
TM671	- 3 Second Gust Wind Speed Isotach
TM675	- Extruded Aluminum Panels
TM676	- Sign Attachments
TM678	- Secondary Sign Mounting Details
TM800	- Tables, Abrupt Edge And PCMS Details
TM810	- Temporary Reflective Pavement Markers
TM820	- Temporary Barricades
TM821	- Temporary Sign Supports
TM850	- 2-Lane, 2 Way Roadways

R/W Map No. 1R-4-1129

REVISED AS CONSTRUCTED

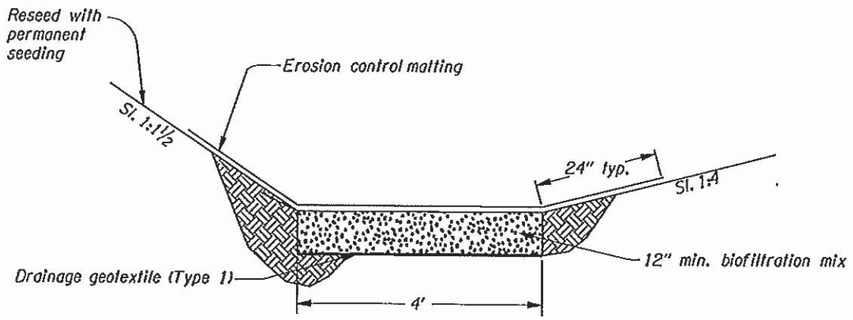
Date Cont. #

JAN 3 2013 C14440

REVISED AS CONSTRUCTED

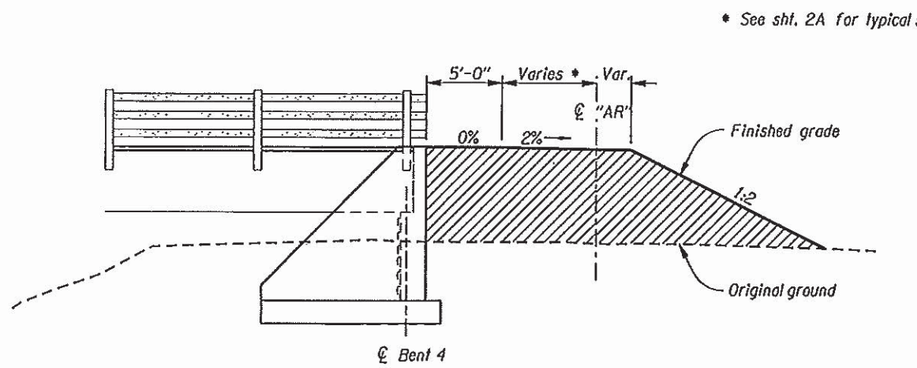
OR138E, TIOGA BR, TRAIL &
SUSAN CR-STEAMBOAT PAVE
NORTH UMPQUA HIGHWAY
DOUGLAS COUNTY

Standard Drawings located on the web at: http://www.oregon.gov/ODOT/HWY/ENGSERVICES/standard_drawings_home.shtml	FEDERAL HIGHWAY ADMINISTRATION	PROJECT NUMBER	SHEET NO.
	OREGON DIVISION	STP-C000(037)	1A



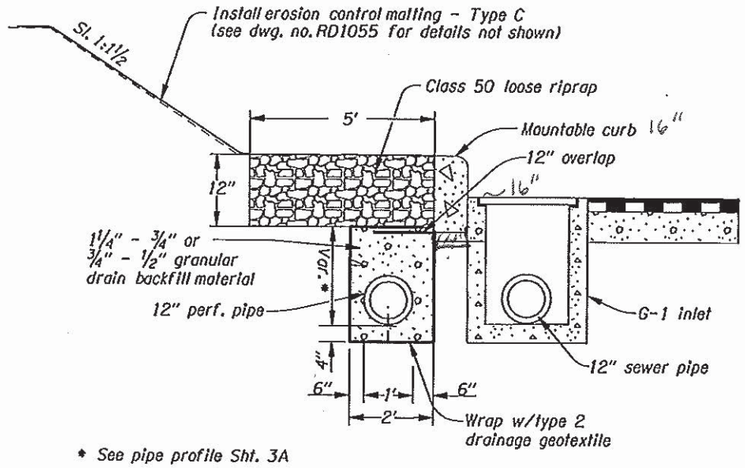
WATER QUALITY SWALE

Not to scale



South Trail Ramp Detail

Not to scale



* See pipe profile Sht. 3A

SUBSURFACE DRAIN DETAIL

Not to scale

REVISED AS CONSTRUCTED

Date Cont. #

JAN 3 2013 C14440

REGISTERED PROFESSIONAL ENGINEER
17258
OREGON
JULY 19, 1994
MICHAEL L. MORRIS

RENEWS: 12-31-2012

OREGON DEPARTMENT OF TRANSPORTATION

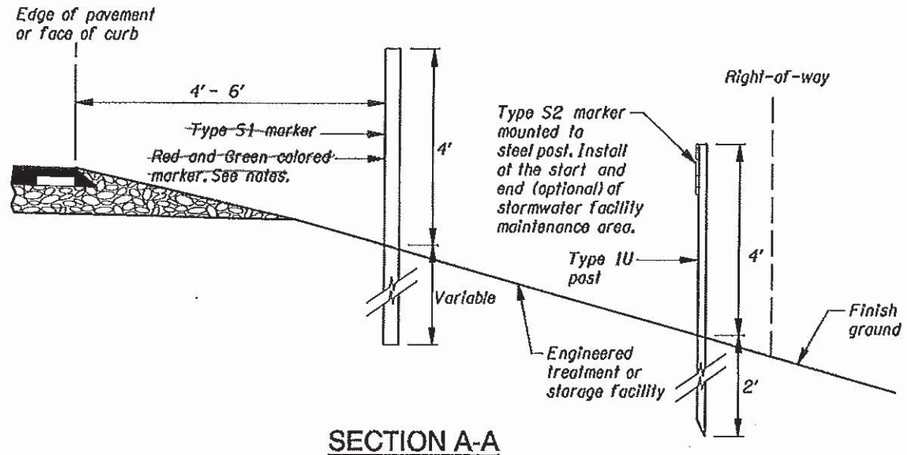
REGION 3 - TECHNICAL CENTER

OR138E: TIOGA BR, TRAIL& SUSAN CR-STEAMBOAT PAVE
NORTH UMPQUA HIGHWAY
DOUGLAS COUNTY

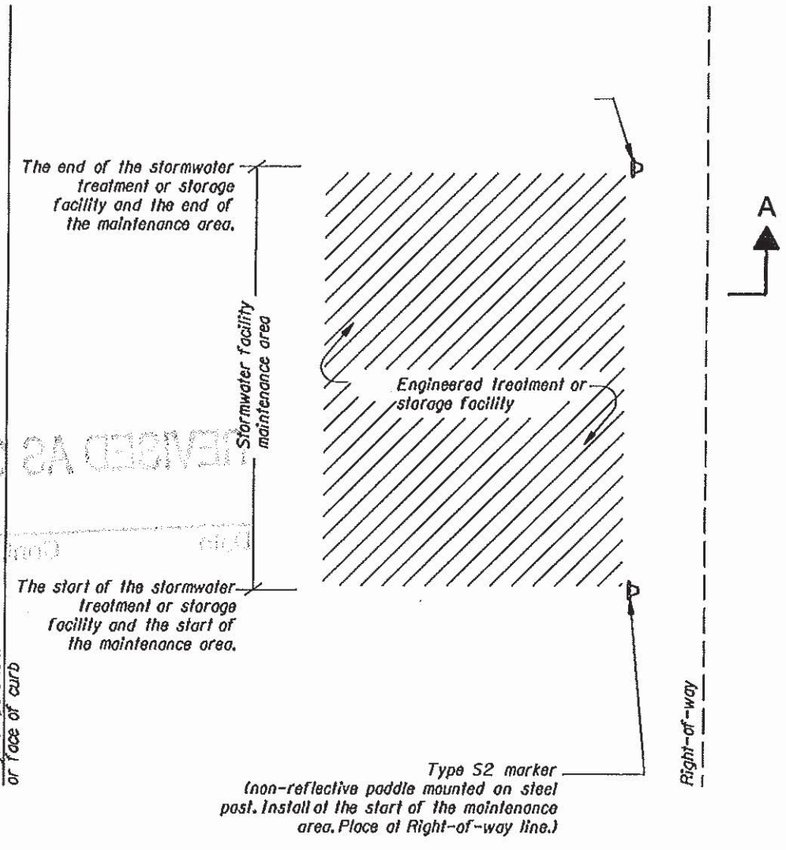
Designed By - Stephanie Ouellette
Reviewed By - Jason Sheadel
Drafted By - Linda K. Coffel

DETAILS

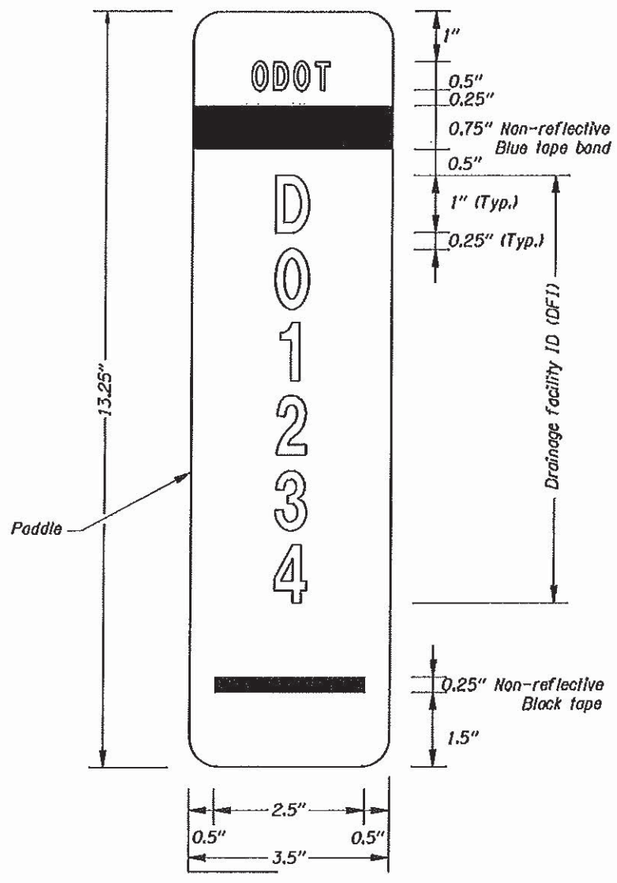
SHEET NO. 2B



SECTION A-A



TYPE S2 MARKER INSTALLATION DETAIL



TYPE S2 MARKER

Notes:
Stormwater Facility Field Marker Type S2:
1. Paddle:
- Aluminum sheet, nominal thickness 0.050"
- White non-reflective background
- Mount paddle to one (1) Type 1U steel post using 3/16" diameter aluminum blind rivets and washers. See Standard Drawing TM570 detail labeled "Steel Posts" for mounting a traffic target. Install paddle onto Type 1U steel post using the same hole pattern.
- Text and numbers are Type C font in non-reflectorized black
- Band is non-reflective blue tape
- Do not mount paddle to other highway signing posts
- Install paddle parallel to travel lane
- Prepare paddle for each "DFI" noted in the marker table

2. Steel Posts:
- See Standard Drawing TM571 for Type 1U steel post dimensions

Facility Location		DFI#	Type S2 Marker Location	
Station	M.P.		Begin	End
"L" 305+25	28.05	D00557		✓
"L"306+30	28.15	D00557	✓	

NOT REVISED AS CONSTRUCTED

Date JAN3 Cont. # C14440

REGISTERED PROFESSIONAL ENGINEER 17258 OREGON JULY 19, 1994 MICHAEL L. MORRIS

RENEWS: 12-31-2012

OREGON DEPARTMENT OF TRANSPORTATION

REGION 3 - TECHNICAL CENTER

OR138E: TIOGA BR, TRAIL& SUSAN CR-STEAMBOAT PAVE
NORTH UMPQUA HIGHWAY
DOUGLAS COUNTY

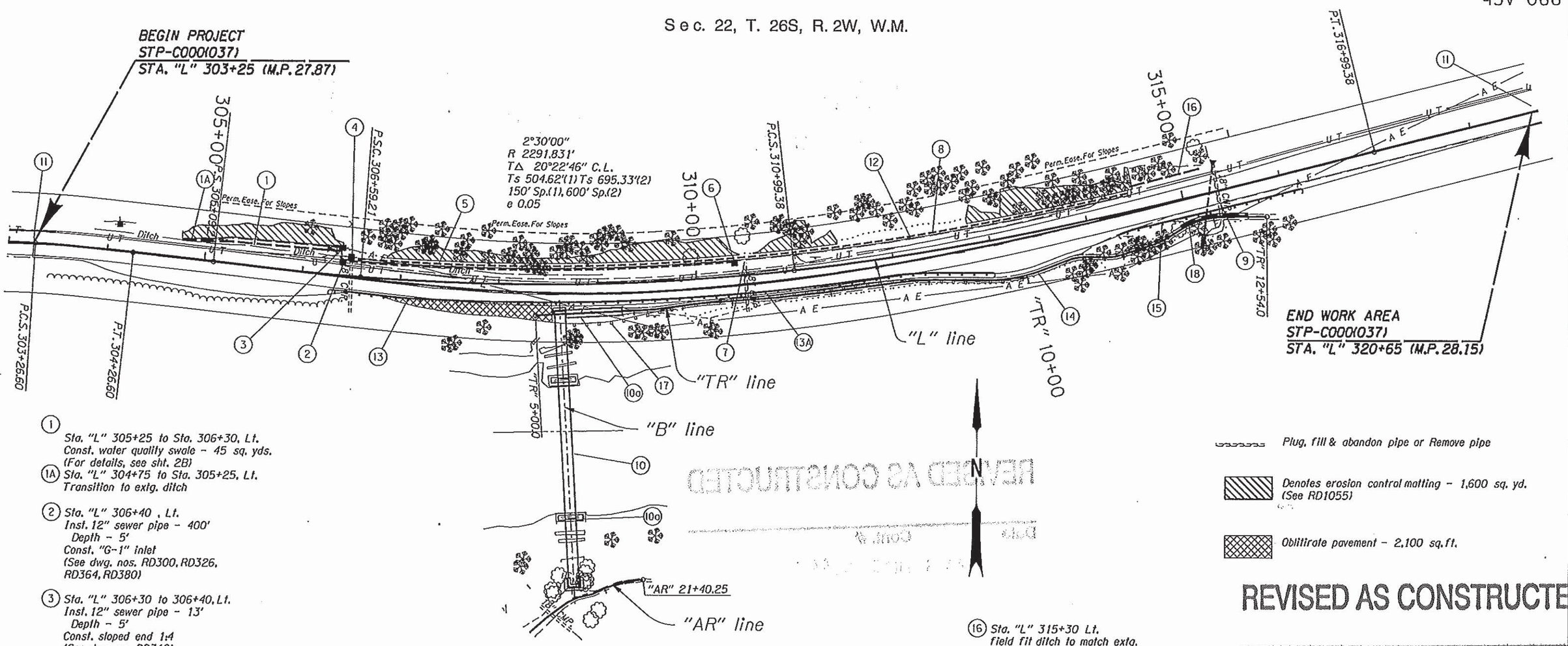
Designed By - Stephanie Ouellette
Reviewed By - Jason Sheadel
Drafted By - Linda K. Coffel

DETAILS

SHEET NO. 2B-3

45V-066

Sec. 22, T. 26S, R. 2W, W.M.



(1) Sta. "L" 305+25 to Sta. 306+30, Lt.
Const. water quality swale - 45 sq. yds.
(For details, see sht. 2B)

(1A) Sta. "L" 304+75 to Sta. 305+25, Lt.
Transition to exig. ditch

(2) Sta. "L" 306+40 , Lt.
Inst. 12" sewer pipe - 400'
Depth - 5'
Const. "G-1" inlet
(See dwg. nos. RD300, RD326, RD364, RD380)

(3) Sta. "L" 306+30 to 306+40, Lt.
Inst. 12" sewer pipe - 13'
Depth - 5'
Const. sloped end 1:4
(See dwg. no. RD318)

(4) Sta. "L" 306+48.0, Lt.
Const. type "G-1" inlet with cap
Connect perf pipe to exig. 18" culvert
(See dwg. no. RD376)

(5) Sta. "L" 306+48 to 314+50, Lt.
Inst. 12" perf. drain pipe - 802'
Depth - 5'
(See dwg. no. RD312)

(6) Sta. "L" 310+40, Lt.
Const. "G-1" inlet

(7) Sta. "L" 310+50.3, Lt.
Exig. 18" culvert plug, fill and abandon

(8) Sta. "L" 306+48.0 to "L" 314+50, Lt.
Const. loose riprap (class 50) - 76 C.Y. 148 C.Y.
(See "Subsurface Drain Detail", Sht. 2B)

(9) Sta. "L" 315+12.6, 39.7' Rt. to 316+36.8, 27.3' Lt. 315+36.8
Remove exig. 18" culvert
Inst. 18" culvert pipe - 72'
5' depth
Const. sloped end 1:4
Const. loose riprap (class 50) - 10 C.Y.
(See dwg. no. RD317)

(10) Bridge #21486 (By others)

(10A) Const. access ramp, Bent 1 and exig. bent retrofits for bridge #21486
(For details, see sht. 1A for bridge drawings)

(11) Const. pavement match
(See dwg. no. RD610)

(12) Sta. "L" 306+40 to Sta. 314+50, Lt.
Const. conc. mountable curb - 810'
(See dwg. no. RD700)

(13) Sta. "L" 306+30 to Sta. 312+97.0, Rt.
Const. guardrail - 600' (Type 2A, weatherized)
Const. guardrail terminal, non-flared (weatherized)
(L= 37.5') - 2
(See dwg. nos. RD400, RD405, RD415, RD420)

(13A) Sta. "L" 309+72 to Sta. 312+97.0, Rt.
Inst. guardrail shin protectors
(For details, see sht. 2B-2)

(14) Sta. "TR" 5+60.0 to Sta. 12+35.0
Const. gravel trail
Connect to BLM trail
(For details, see sht. 2)

(15) Sta. "L" 314+28.5 to Sta. 316+17.5 Rt. 318+05
Const. guardrail - 112.5' (Type 2A) (weatherized)
Extra for 8' long post - 14 each
Const. guardrail terminal, non-flared (weatherized)
(L=37.5') - 2 318+05 to 314+30 INSTALL guardrail Shin Protectors (Detail 2B-2)

(16) Sta. "L" 315+30 Lt.
Field fit ditch to match exig.

(17) Sta. "L" 308+68.5, 40' Rt. to 313+11.6, 42' Rt.
Remove exig. guardrail - 450'

(18) Sta. "TR" 11+65.0 to "TR" 12+35.0
Const. retaining wall structure #21710
(For details, see sht. GC-1)

Plug, fill & abandon pipe or Remove pipe

Denotes erosion control matting - 1,600 sq. yd. (See RD1055)

Obliterate pavement - 2,100 sq.ft.

Date JAN 3 2013 Cont. # C14440

REGISTERED PROFESSIONAL ENGINEER
7259
OREGON
JULY 19, 1994
MICHAEL L. MORRIS
RENEWS: 12-31-2012

OREGON DEPARTMENT OF TRANSPORTATION

REGION 3 - TECHNICAL CENTER

OR138E: TIOGA BR, TRAIL & SUSAN CR-STEAMBOAT PAVE
NORTH UMPQUA HIGHWAY
DOUGLAS COUNTY

Designed By - Stephanie Ouellette
Reviewed By - Jason Sheadel
Drafted By - Linda K. Coffel

GENERAL CONSTRUCTION

SHEET NO. 3

Sec. 22, T. 26S, R. 2W, W.M.

45V-066

"L" LINE

BEGIN PROJECT
STP-C000(037)
STA. "L" 303+25 (M.P. 27.87)

+25.0, 24.2' Lt.
Biofiltration Swale
FL Elev. 895.84'

+30.0, 25.5' Lt.
12" sewer pipe
FL Elev. 895.85'

+40.0, 13.2' Lt.
G-1 Inlet
FL Elev. 896.29'

+48.0, 18.0' Lt.
G-1 Inlet w/ cap
FL Elev. 894.03'
Connect extg. 18" culvert to perf. pipe

+40.0, 13.2' Lt.
G-1 Inlet
FL Elev. 898.88'

+50.0, 18.0' Lt.
12" perf. pipe
FL Elev. 902.55'

+36.8, 27.7' Lt.
18" culvert pipe
FL Elev. 901.52

+12.6, 39.7' Rt.
18" culvert pipe
FL Elev. 894.16

Profile grade @ ℄

Exstg. ground @ ℄

12" sew. pipe-13'
Slope-3.38%
Swale-105'
Slope-0.01%

12" Sewer Pipe-400'
Slope-0.65 %

GRADE BREAK
12" SEWER PIPE
200'

12" SEWER PIPE
200' Slope-5%

12" SEWER PIPE 200'
SLOPE-0.5%

Grd FL

12" Perf. Drain-802'
Slope-0.78%

Abandon 18" culvert pipe

Remove exstg. 18" culvert

18" Culvert Pipe-72.0'
Slope-10.33%

Exc. Left "L" line - 2,335 C.Y.

Emb. Left "L" line - 485 C.Y.

Exc. Right "L" line - 88 C.Y.

Emb. Right "L" line - 116 C.Y.

305 310 315

"AR" LINE

"B" ℄

Finished grade @ ℄

Sta "AR" 21+31.33
Match extg. ground
Elev. 902.01

Sta "AR" 20+11.20
Match extg. ground
Elev. 902.48

Exstg. ground @ ℄

Exc. 5 C.Y.

Emb. 221 C.Y.

21+50

18 20

"TR" LINE

Profile grade @ ℄

Exstg. ground @ ℄

Exc. 21 C.Y.

Emb. 129 C.Y.

5 10 12+50

REVISED AS CONSTRUCTED

Date

Cont. #

JAN 3 2013 C14440

REVISED AS CONSTRUCTED

REGISTERED PROFESSIONAL ENGINEER
17258
OREGON
JULY 19, 1994
MICHAEL L. MORRIS

RENEWS: 12-31-2012

OREGON DEPARTMENT OF TRANSPORTATION

REGION 3 - TECHNICAL CENTER

OR138E: TIOGA BR, TRAIL & SUSAN CR-STEAMBOAT PAVE
NORTH UMPQUA HIGHWAY
DOUGLAS COUNTY

Designed By - Stephanie Ouellette
Reviewed By - Jason Sheadel
Drafted By - Linda K. Coffel

PROFILE

SHEET NO. 3A

F:\ODOT_DATA\Projects\17385_Tioga\ROADWAY\17385.pll :: Default 2/15/2012 12:48:05 PM hwye32v

1:1200 8/74 002