OPERATION & MAINTENANCE MANUAL

DFI No. : D00300
Facility Type: Water Quality Biofiltration Swale

June, 2011

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6. AUXILIARY OUTLET (HIGH FLOW BYPASS) 5
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APPENDIX A: Operational Plan and Profile Drawing(s)

APPENDIX B: ODOT Project Plan Sheets

1. Identification

Drainage Facility ID (DFI):	D00300
Facility Type:	Water Quality Biofiltration Swale
Construction Drawings:	(V-File Number) 42V-031
Location:	District: 2B (Old 2A)
	Highway No.: 001
	Mile Post: 288.21; 288.26 (beg./end)]
	Description: This facility is located at the I-5 (Hwy 001) & I-205 (Hwy 064) Interchange, between the southbound on-ramp and the southbound lanes of I-5 (hwy 001) itself.

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:	Consultant Designer – Murray, Smith & Associates Inc. Gabriel E. Crop, P.E., (503)-225-0910
Facility construction:	2009
Contractor:	Benge Construction dba Kodiak Pacific 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.

This facility is located in the southwest quadrant of the I-5 (hwy 001) and the I-205 (hwy 064) Interchange near Tualatin, Oregon. Access to the facility is gained from the right shoulder of the southbound lanes I-5, or from the left shoulder of the on-ramp to I-5 (Photo 4).

This facility (Photo 1) is approximately 195-ft in length with a mild slope. The swale receives stormwater from inlets located along the I-5 (hwy 001) on-ramp. Water is conveyed to a 12-inch diameter swale inlet pipe (Photo 2, Operational Plan Point A, Appendix A) located on the south side of the facility. The swale also receives stormwater runoff in the form of sheet flows from the adjacent travel lanes and on-ramp. Once inside the swale, stormwater travels northward and encounters three flow spreaders (Points C) spaced 50-feet apart along the swale's channel. The swale's channel also contains rigid high-density polyethylene (HDPE) porous pavers, two 6-inch perforated drain pipes located ±0.7-feet under the side slopes, and a geotextile type-1 fabric (Appendix B sheet no. GJ-3). The treated water exits the facility through a type "D" inlet (Photo 3, Point D) at the north end of the swale which leads to a 12-inch pipe that conveys the water into the nearby stormwater system.

A. Maintenance equipment access:
   Access can be obtained with no obstacles from either I-5's southbound lane or the I-5 on-ramp (Photo 4).

B. Heavy equipment access into facility:

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

C. Special Features:

   ☐ Amended Soils
   ☒ Porous Pavers
   ☒ Liners
   ☒ Underdrains

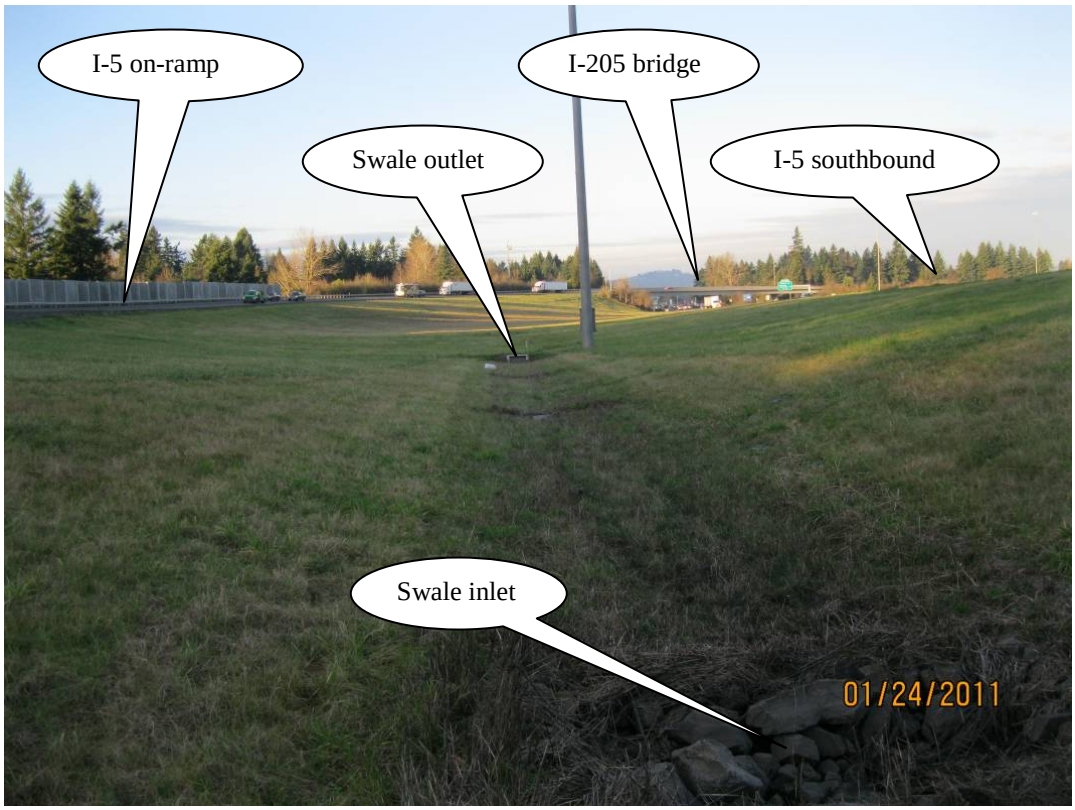


Photo 1: Water Quality Biofiltration Swale looking north

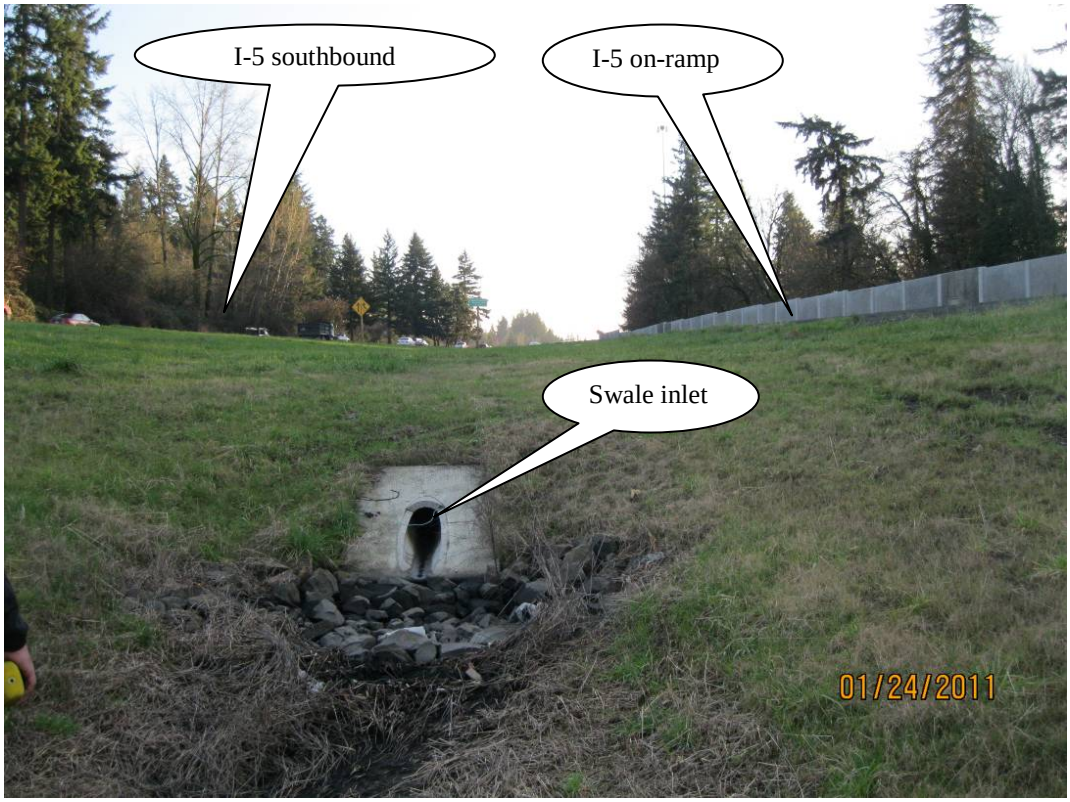


Photo 2: Swale Inlet Looking South

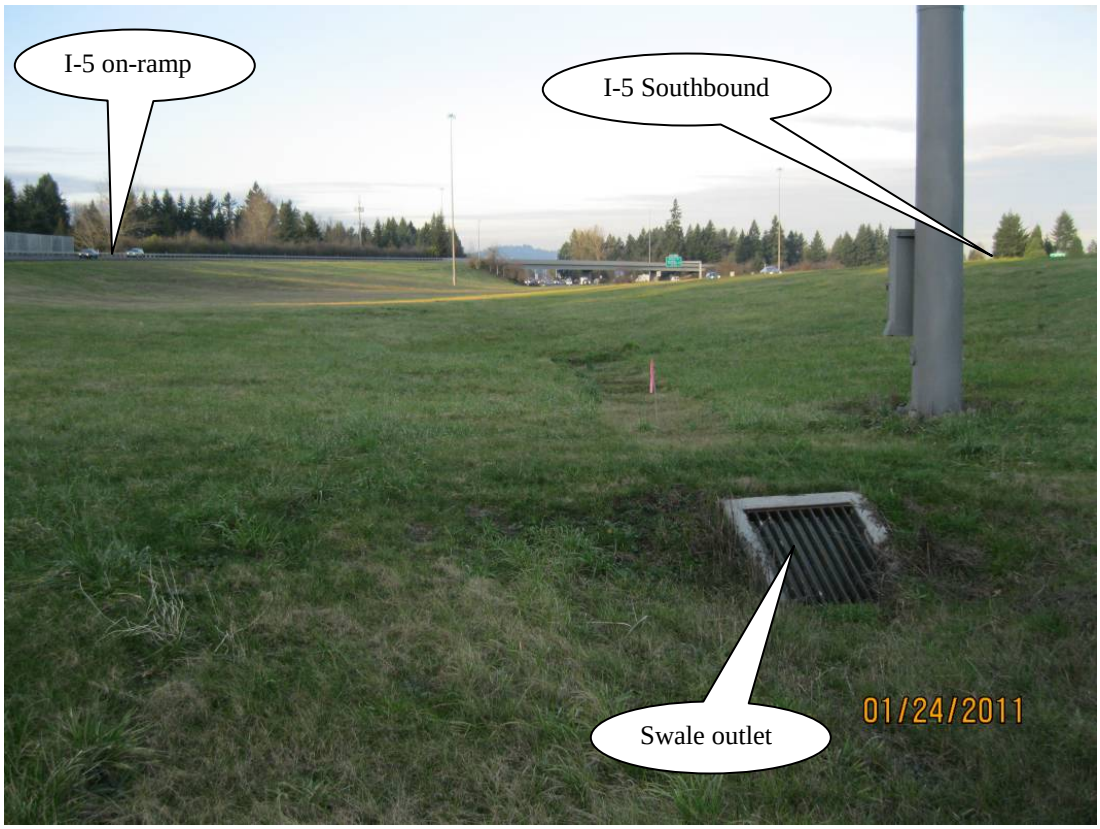


Photo 3: Swale Outlet

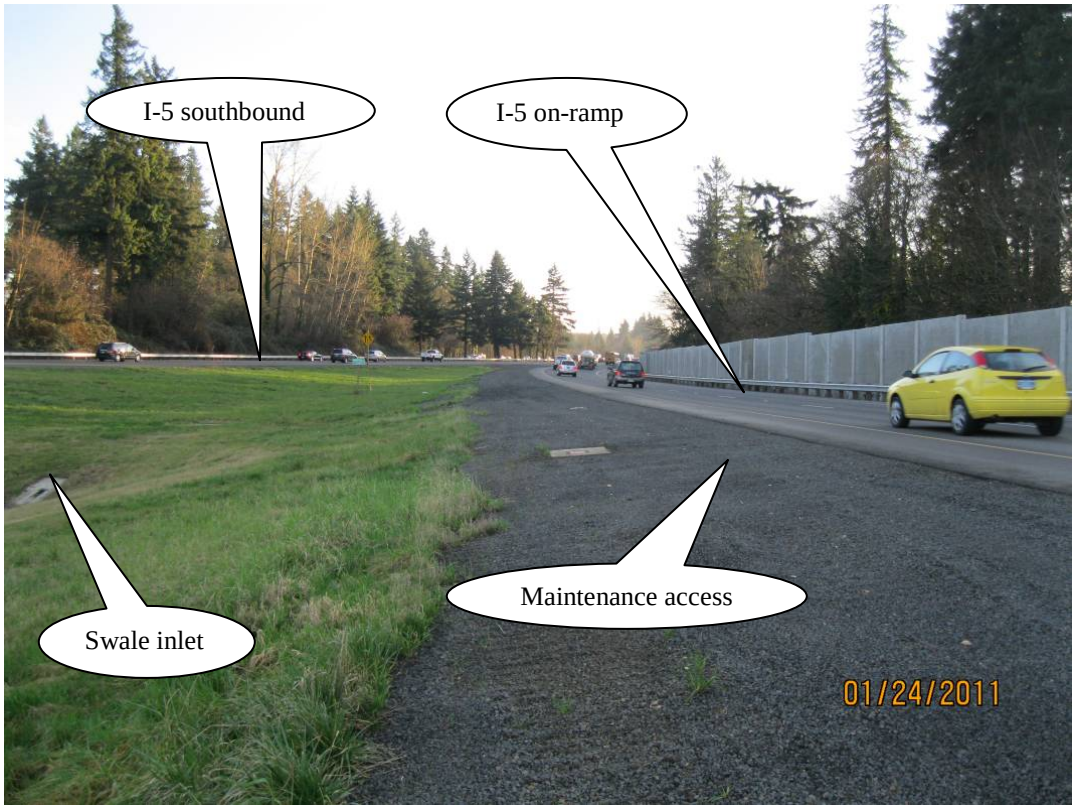


Photo 4: Swale Access Looking South

5. Facility Haz Mat Spill Feature(s)

The water quality biofiltration swale can be used to store a volume of liquid by blocking the 12-inch diameter outlet pipe within the type “D” inlet (Photo 3, Point D) which functions as the outlet to the swale.

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, as noted below
There are no auxiliary features designed into this facility.

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)

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

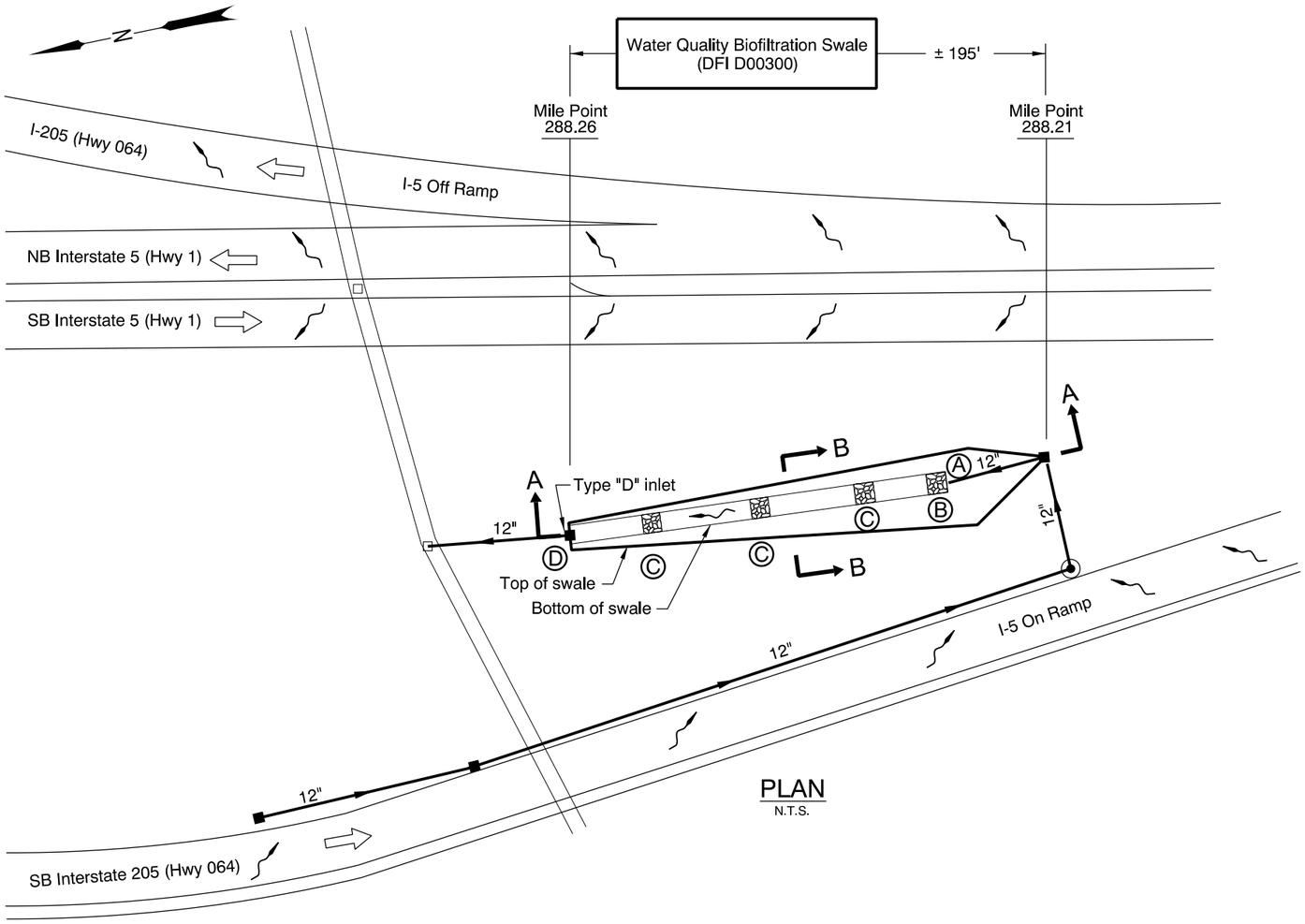
Contact any of the following for more detailed information about management of waste materials found on site:

ODOT Clean Water Unit	(503) 986-3008
ODOT Statewide Hazmat Coordinator	(503) 229-5129
ODOT Region Hazmat Coordinator	(503) 731-8304
ODEQ Northwest Region Office	(503) 229-5263

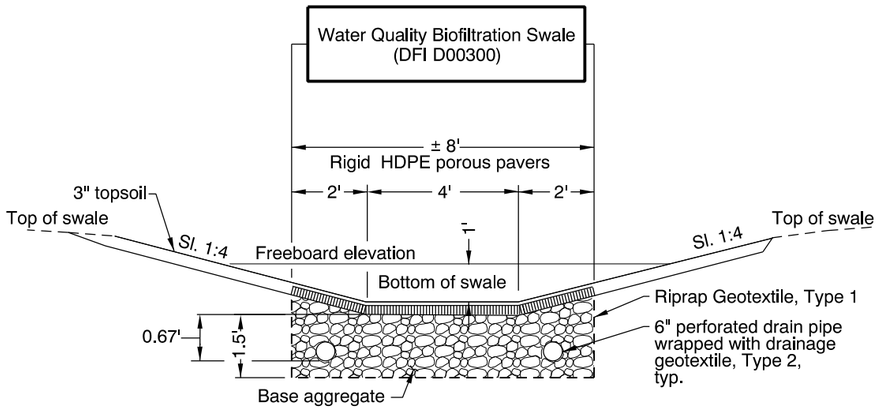
Appendix A

Content:

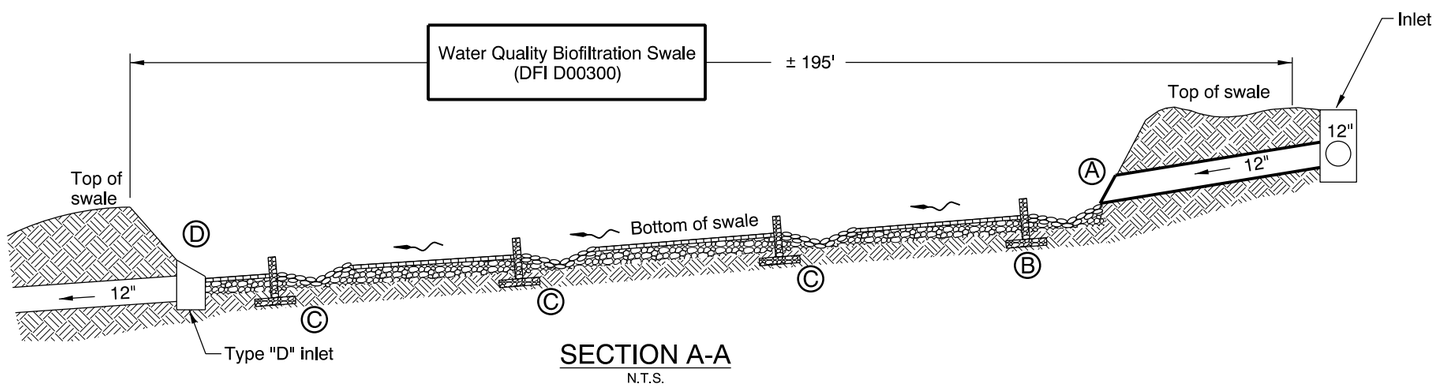
- **Operational Plan and Profile Drawing(s)**



PLAN
N.T.S.



SECTION B-B
N.T.S.



SECTION A-A
N.T.S.

LEGEND:

- Photo Location / Direction
- (A) Swale Inlet
- (B) Energy Dissipator / Flow Spreader
- (C) Flow Spreader with Riprap Basin
- (D) Swale Outlet
- Manhole
- Inlet
- Storm Pipe (Facility)
- Storm Pipe
- Conveyance Direction
- Pavement / Facility Flow Path
- Traffic Flow / Direction

Sht. 1 of 1

OREGON DEPARTMENT OF TRANSPORTATION

Prepared By: C. Fox

Drafted By: H. Skeen/R. Schultz

DFI D00300
MAINTENANCE DISTRICT 2B HWY 1
WATER QUALITY BIOFILTRATION SWALE
PACIFIC HIGHWAY MP 288.21-288.26
CLACKAMAS COUNTY

Z:\Hydraulics\Hydraulics OM\Completed_Facility_Files\Dist_2B\Hwy_001\2B_001_D00300\Operational Plan\DFI_D00300.dgn :: Sheet 1/14/2014 3:10:56 PM hwyr33e

DFI_D00300.dgn

Appendix B

Content:

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

42V-31

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

STATE OF OREGON

DEPARTMENT OF TRANSPORTATION

PLANS FOR PROPOSED PROJECT

GRADING, DRAINAGE, STRUCTURES, PAVING, SIGNING & SIGNALS

I-5: TUALATIN RIVER - WILLAMETTE RIVER BRIDGE SEC.

PACIFIC HIGHWAY

MULTNOMAH, WASHINGTON & CLACKAMAS COUNTIES

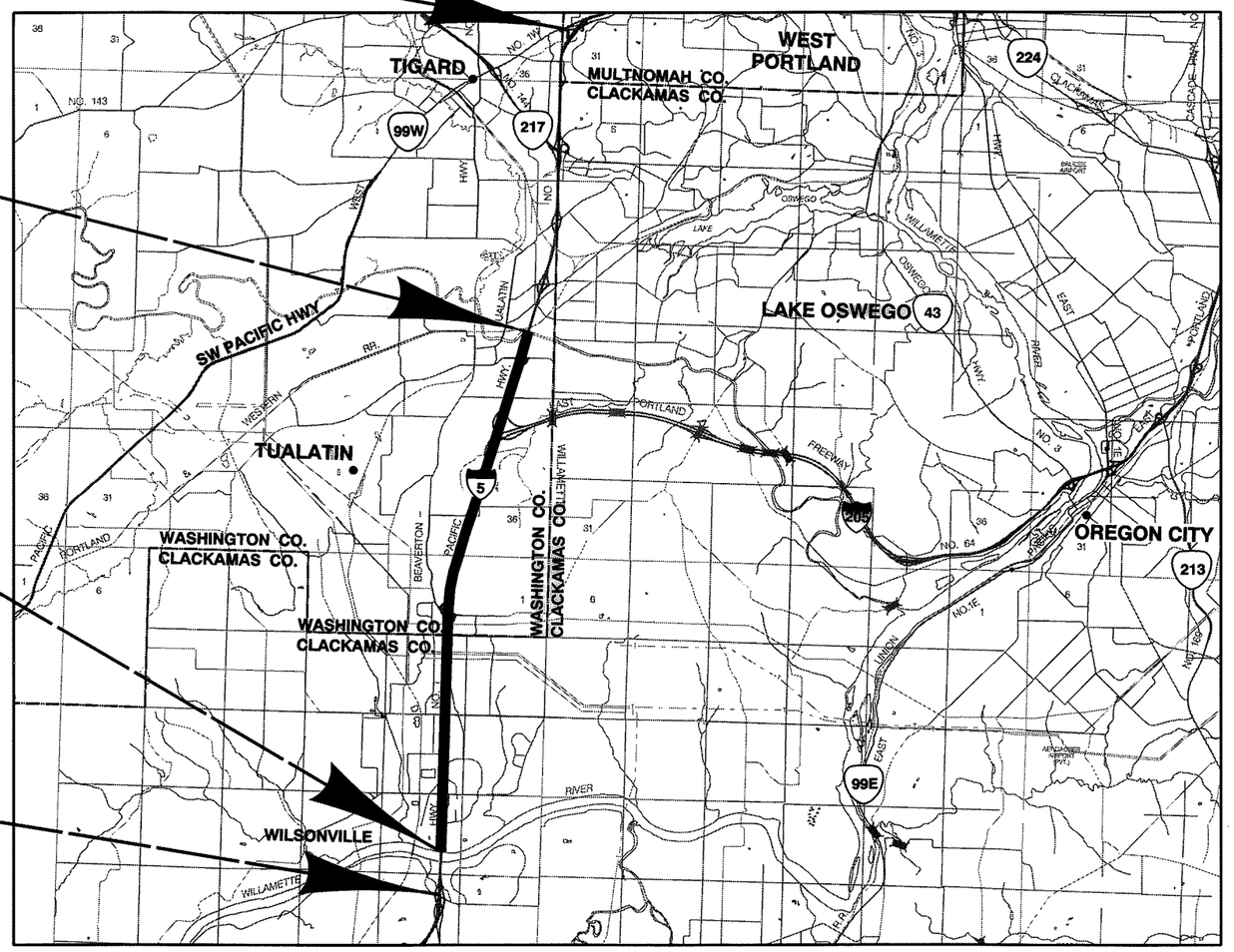
APRIL 2009

IM-S001 (323)
BEGINNING OF CONTRACT
STA. "L2" 995+00 (M.P. 294.15)

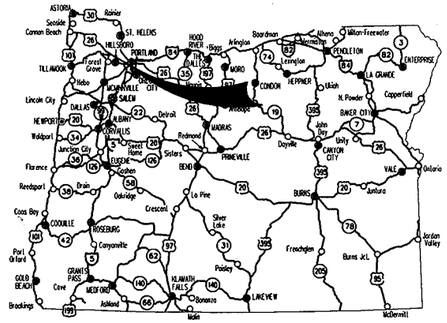
IM-S001 (323)
BEGINNING OF PAVING
STA. "LN2" 1226+00 (M.P. 289.74)
STA. "LS2" 1226+00

IM-S001 (323)
END OF PAVING
STA. "LN2" 1571+80 (M.P. 283.21)
STA. "LS2" 1572+04

IM-S001 (323)
END OF CONTRACT
STA. "LN2" 1596+40 (M.P. 282.74)
STA. "LS2" 1596+64



T. 2S., T. 3S., R. 1E., R 1W., W.M.



Overall Length Of Project - 11.41 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

OREGON TRANSPORTATION COMMISSION

Gail L. Achterman	CHAIR
Mike Nelson	VICE CHAIR
Janice J. Wilson	COMMISSIONER
Alan Brown	COMMISSIONER
David Lohman	COMMISSIONER
Matthew L. Garrett	DIRECTOR OF TRANSPORTATION

PLANS PREPARED FOR
OREGON DEPARTMENT OF TRANSPORTATION
BY:
MURRAY, SMITH & ASSOC., INC.

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.

By: Kevin M. Tuttle 3/4/09
Signature & date
Kevin M. Tuttle, P.E.
Print name and title Proj. Mgr.
Concurrence by ODOT Chief Engineer

I-5: TUALATIN RIVER
WILLAMETTE RIVER BRIDGE SEC.
PACIFIC HIGHWAY
MULTNOMAH, WASHINGTON & CLACKAMAS COUNTIES

FEDERAL HIGHWAY ADMINISTRATION	PROJECT NUMBER	SHEET NO.
OREGON DIVISION	IM-S001 (323)	1

G:\05\0784\CAD-4353\CAD\MID\13702-cover.tsl :: Default 3/5/2009 8:35:01 AM SKW

Sec. 25, T. 2S, R. 1W, W.M.

EAST PORTLAND FREEWAY INTERCHANGE (I-205)

"EN2" LINE

"LN2" LINE
(For Profile, See Sht. 28B)

"LS2" LINE
(For Profile, See Sht. 28B)

"ES2" LINE
(For Profile, See Sht. 28C & 28C-2)

"EN2" 1300+00

"LN2" 1300+00

"LS2" 1300+00

"ES2" 1300+00

"EN2" 1305+00

"LN2" 1305+00

"LS2" 1305+00

"ES2" 1305+00

"EN2" 1310+00

"LN2" 1310+00

"LS2" 1310+00

"ES2" 1310+00

"EN2" 1301+41.90 P.C.S.

"EN2" 1306+67.58 P.T. (36.25' Rt.)

"EN2" 1306+41.90 P.T.

S.21°35'25"W.

"ES2" 1304+91.07 P.C.S.

"ES2" 1309+91.07 P.T.

"ES2" 1310+02.49 P.S.

"ES2"
4°00'00" C.L.
Δ 74°15'37"
Ts 1339.74'
2-500.00' Sp.
S10°00'00"
a 0.80

"SWM" 1+00

"SWM" 2+00

"SWM" 2+95

12" - 52'

12" - 56'

12" - 68'

12" - 299'

12" - 99'

S.0°09'07"E.

Taper 10:1

Taper 20:1

Taper 35:1

Ditch

CB

U E

U T F O

Paving Limits

Extg. Cable Barrier Shown Thus: ——CB——

Continuously Reinforced Conc. Pvmt. Repair Shown Thus:

HMAC Grind & Inlay Shown Thus:

Compost Amended Vegetated Filter Strip Shown Thus:

REGISTERED PROFESSIONAL ENGINEER
70713
OREGON
JULY 11, 2006
GABRIEL E. CROP

RENEWAL DATE: 12-31-2009

OREGON DEPARTMENT OF TRANSPORTATION

Murray, Smith & Associates, Inc.
121 S.W. Salmon, Suite 900, Portland, Oregon 97204-2919
503.225.9010

MSA

I-5: TUALATIN RIVER - WILLAMETTE RIVER BRIDGE SEC.

PACIFIC HIGHWAY
MULTNOMAH, WASHINGTON & CLACKAMAS COUNTIES

Reviewed By - Gabriel E. Crop
Designed By - Gwenyth N. Linscheid
Drafted By - Susan K. Wentz

ALIGNMENT & GENERAL CONSTRUCTION

SHEET NO. 28

(1) *See Sht. 27A, Note 3*
HMAC Grind & Inlay
(For Details, See Sht. 2B-14)

(2) *See Sht. 27A, Note 2*
Terminal Expansion Joint Spall Repair
(For Details, See Sht. 2B, 2B-3, 2B-5 & 2B-6)

(3) *Continuously Reinforced Conc. Pvmt. Repair - 67 Sq.Yd.*
(For Details, See Sht. 2B, 2B-3 & 2B-5)

(4) *See Sht. 27A, Note 28*
HMAC Grind & Inlay
(For Details, See Sht. 2B-14)

(5) *See Sht. 27A, Note 6*
Remove Extg. Guardrail
Const. Guardrail (Type 2A)
Const. Guardrail Terminal, Non-Flared (50')
W=1', E=0

(6) *See Sht. 27A, Note 27*
Remove Extg. Guardrail
Const. Guardrail (Type 2A)

(7) *Sta. "EN2" 1302+70 To Sta. "LN2" 1309+57.5, Lt.*
Remove Extg. Guardrail - 562.5'
Const Guardrail - 637.5' (Type 2A)
Const. Anchor (Type 1 Mod.)
Inst. End Piece (Type B)
Const. Guardrail Terminal, Non-Flared (50')
W=1', E=12'
(See Drg. No. RD470)

(8) *See Sht. 27A, Note 25*
Adjust Extg. Guardrail

(9) *See Sht. 27A, Note 30*
Transition To Extg. Pvmt.
(For Details, See Sht. 2B-9)

(10) *Transition From Grind & Inlay To Overlay*
(For Details, See Sht. 2B-7)

(11) *Continuously Reinforced Conc. Pvmt. Repair - 40 Sq.Yd.*
(For Details, See Shts. 2B, 2B-3 & 2B-5)

(12) *Const. Water Quality Swale*
(For Details, See Shts. GJ-3, GJ-4, GJ-5, GJ-7 & GJ-8)

(13) *Sta. "ES2" 1307+80 - 131' Lt.*
Const. Type "D" Inlet
Inst. 12" Sew. Pipe - 68'
10' Depth
Connect To Extg. Inlet
(See Drg. No. RD370)

(14) *Sta. "ES2" 1310+25 - 85' Lt.*
Const. Field Inlet
Inst. 12" Sew. Pipe - 52'
5' Depth
Const. 12" Sloped End Section
Const. Paved End Slope
(See Drg. Nos. RD316, RD318, RD320 & RD374)

(15) *Sta. "LN2" 1308+16 To Sta. "LN2" 1319+16, Rt.*
Remove Extg. Guardrail - 1075'
Const. Guardrail - 962.5' (Type 2A)
Const. Anchor (Type 1 Mod.)
Const. End Piece (Type B)

(16) *Sta. "LS2" 1307+68 To Sta. "LS2" 1320+05.5, Lt.*
Remove Extg. Guardrail - 1237.5'
Const. Guardrail - 1100' (Type 2A)
Const. Guardrail Terminal, Flared
Flare Rate = 1:15, W=4', E=2'
Const. Cable Barrier Guardrail Connection
Option 2A

(17) *See Sht. 27A, Note 34*
Const. Compost Amended Vegetated Filter Strip, 9' Wide
(For Details, See Sht. GJ)

(18) *See Sht. 27A, Note 35*
Const. Compost Amended Vegetated Filter Strip, 6' Wide
(For Details, See Sht. GJ)

(19) *Sta "ES2" 1306+22 - 26' Lt.*
Const. Type "G-2" Inlet
Inst. 12" Sew. Pipe - 99'
5' Depth
Trench Resurfacing - 39 Sq.Yd.

(20) *Sta "ES2" 1307+22 - 26' Lt.*
Const. Type "G-2" Inlet
Inst. 12" Sew. Pipe - 299'
10' Depth
Trench Resurfacing - 117 Sq.Yd.

(21) *Sta "ES2" 1310+22 - 28' Lt.*
Const. Storm Sew. Manhole
Inst. 12" Sew. Pipe - 56'
10' Depth
(See Drg. No. RD336, RD344 & RD356)

△2 (22) *See Sht. 27A, Note 29*
Const. Low Profile Mountable Curb

(23) *See Sht. 27A, Note 33*
Const. Compost Amended Vegetated Filter Strip, 6' Wide
(For Details, See Sht. GJ)

△3 △1 (24) *Structure No. 21139*
Sta. "ES2" 1301+14 To Sta. "LS2" 1339+35, Rt.
Const. Soundwall
(For Drg. Nos., See Sht. 1A)

△1 (25) *Structure No. 16037G*
Sta. "LN2" 1308+41, Lt.
Remove Extg. Sign Bridge

△1 (26) *Structure No. 21135*
Sta. "LN2" 1308+10, Lt.
Const. Sign Bridge
(For Drg. Nos., See Sht. 1A)

Rev. No.	Description	Date	Engineer
△1	Addenda #1 - Structure Reference	3/30/09	CDA
△2	Addenda #1 - Changed Note Reference	3/30/09	GNL
△3	Addenda #2 - Changed Stationing	4/6/09	GNL

REGISTERED PROFESSIONAL ENGINEER
70713
OREGON
JULY 11, 2006
GABRIEL E. CROP
RENEWAL DATE: 12-31-2009

OREGON DEPARTMENT OF TRANSPORTATION

Murray, Smith & Associates, Inc.
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503.225.9010
MSA

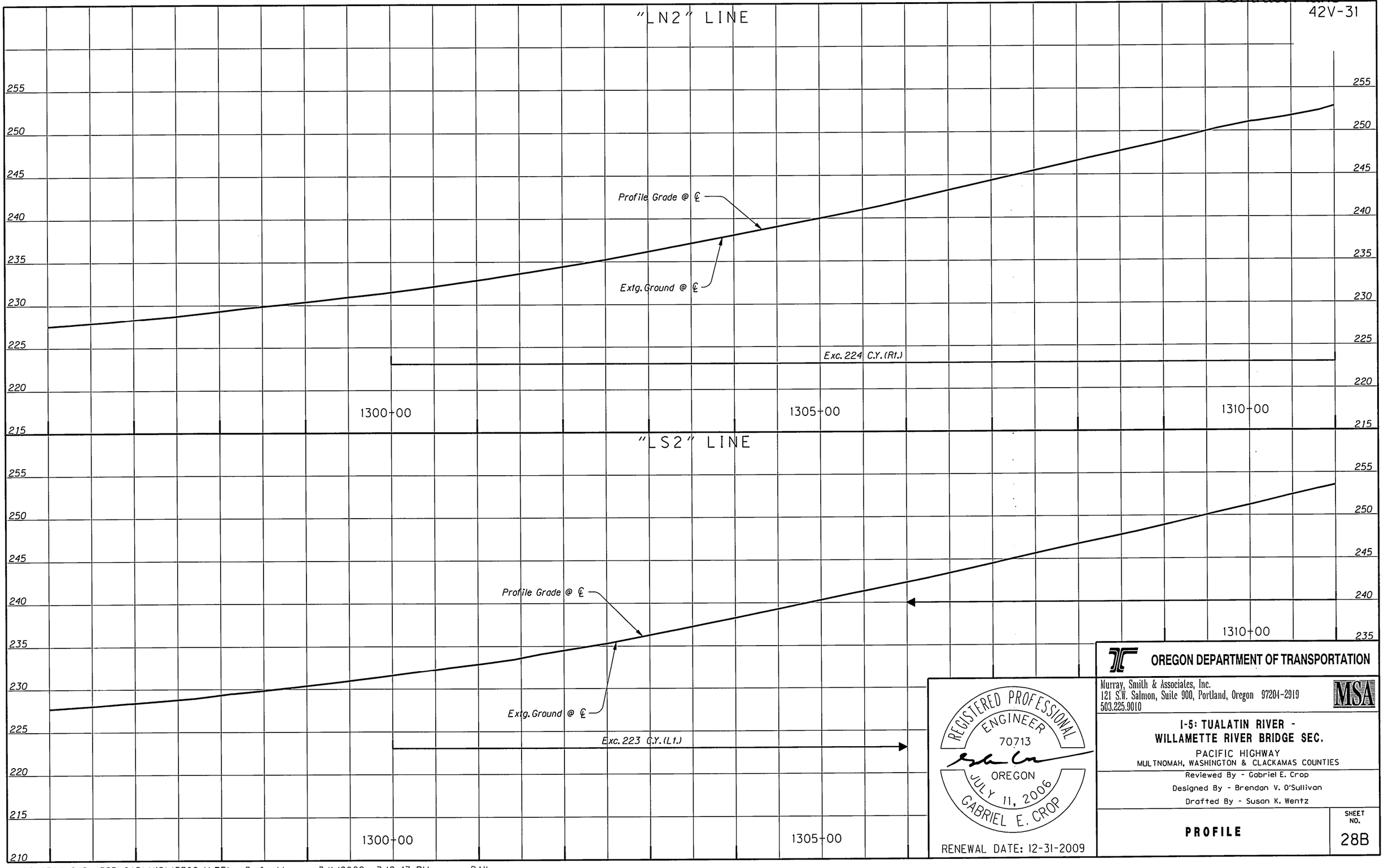
I-5: TUALATIN RIVER - WILLAMETTE RIVER BRIDGE SEC.
PACIFIC HIGHWAY
MULTNOMAH, WASHINGTON & CLACKAMAS COUNTIES

Reviewed By - Gabriel E. Crop
Designed By - Gwenyth N. Linscheid
Drafted By - Susan K. Wentz

GENERAL CONSTRUCTION

SHEET NO. 28A

"LN2" LINE



OREGON DEPARTMENT OF TRANSPORTATION

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REGISTERED PROFESSIONAL ENGINEER
70713
OREGON
JULY 11, 2006
GABRIEL E. CROP
RENEWAL DATE: 12-31-2009

I-5: TUALATIN RIVER - WILLAMETTE RIVER BRIDGE SEC.

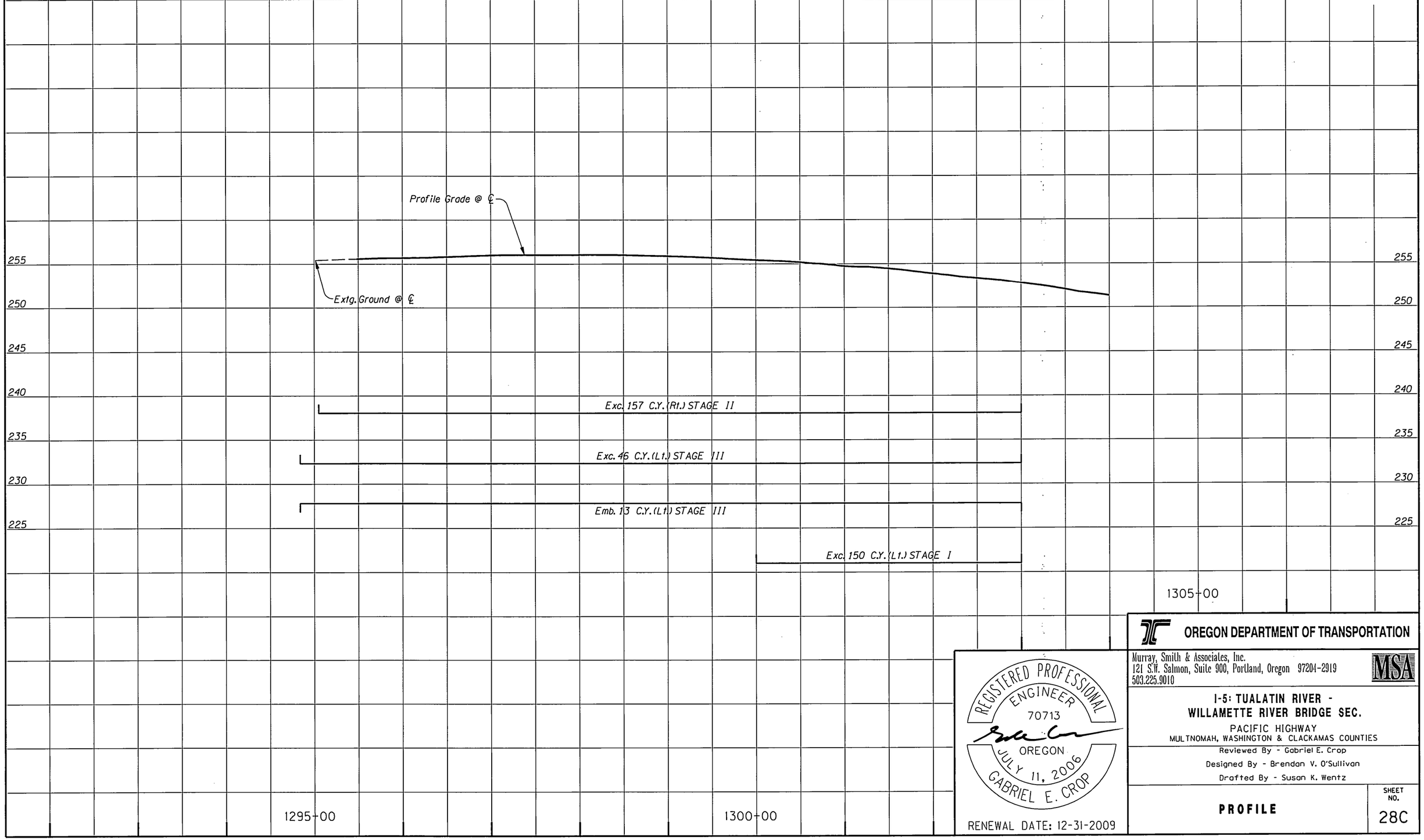
PACIFIC HIGHWAY
MULTNOMAH, WASHINGTON & CLACKAMAS COUNTIES

Reviewed By - Gabriel E. Crop
Designed By - Brendon V. O'Sullivan
Drafted By - Susan K. Wentz

PROFILE

SHEET NO. 28B

"ES2" LINE



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PACIFIC HIGHWAY
MULTNOMAH, WASHINGTON & CLACKAMAS COUNTIES

Reviewed By - Gabriel E. Crop
Designed By - Brendan V. O'Sullivan
Drafted By - Susan K. Wentz

PROFILE

SHEET NO. 28C

"ES2" LINE

Profile Grade @ ℄

Extg. Ground @ ℄

+22 Lt. Inlet F.L. 242.4± (N)
F.L. 242.3± (S)

+22 Lt. Inlet F.L. 243.4± (S)

+22 Lt. Manhole F.L. 240.8± (N)
F.L. 240.7± (W)

+25 Lt. Inlet F.L. 239.3± (N)
F.L. 239.8± (E)

+80 Lt. Inlet F.L. 230.0± (N)

Extg. Inlet F.L. 228.6± (S)

19 20 21 14 13

+1.00%
12" - 99'

-0.50%
12" - 299'

-1.60%
12" - 56'

+5.40%
12" - 52'

+2.00%
12" - 68'

Exc. 600 C.Y. (Lt.) STAGE I
Exc. 587 C.Y. (Rt.) STAGE II

Exc. 24 C.Y. (Lt.) STAGE III

Emb. 17 C.Y. (Lt.) STAGE III

255
250
245
240
235
230
225

1305+00
1310+00
1315+00

REGISTERED PROFESSIONAL ENGINEER
70713
OREGON
JULY 11, 2006
GABRIEL E. CROP
RENEWAL DATE: 12-31-2009

OREGON DEPARTMENT OF TRANSPORTATION

Murray, Smith & Associates, Inc.
121 S.W. Salmon, Suite 900, Portland, Oregon 97204-2919
503.225.9010

MSA

I-5: TUALATIN RIVER - WILLAMETTE RIVER BRIDGE SEC.

PACIFIC HIGHWAY
MULTNOMAH, WASHINGTON & CLACKAMAS COUNTIES

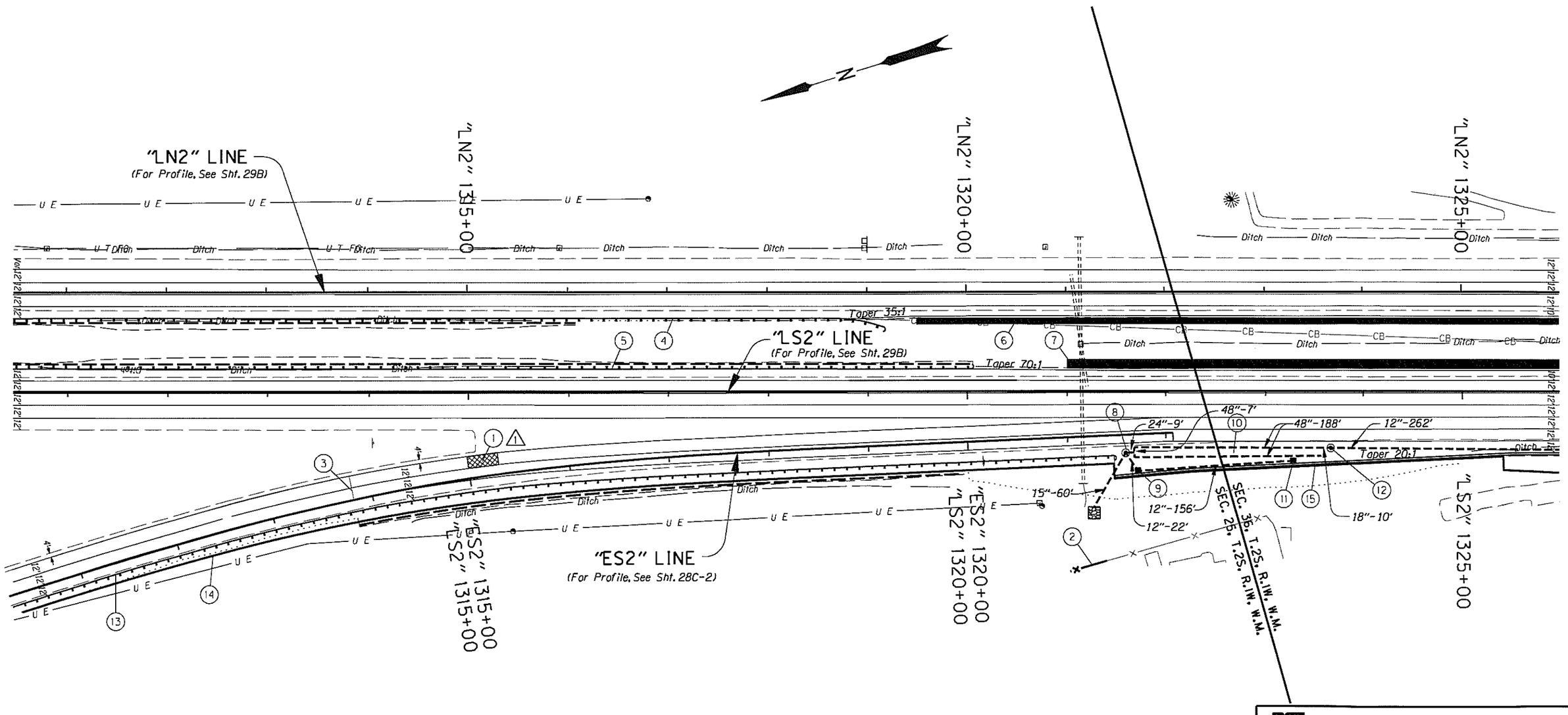
Reviewed By - Gabriel E. Crop
Designed By - Brendan V. O'Sullivan
Drafted By - Susan K. Wentz

PROFILE

SHEET NO. 28C-2

EAST PORTLAND FREEWAY INERCHANGE (I-205)

42V-31



Rev. No.	Description	Date	Engineer
1	Addenda #4 - Changed Pvmt. Repair Width	4/15/09	GNL

Extg. Cable Barrier Shown Thus: —CB—

Continuously Reinforced Conc. Pvmt. Repair Shown Thus:

Compost Amended Vegetoted Filter Strip Shown Thus:

REGISTERED PROFESSIONAL ENGINEER
70713
OREGON
JULY 11, 2006
GABRIEL E. CROP

RENEWAL DATE: 12-31-2009

OREGON DEPARTMENT OF TRANSPORTATION

Murray, Smith & Associates, Inc.
121 S.W. Salmon, Suite 900, Portland, Oregon 97204-2919
503.225.9010

MSA

I-5: TUALATIN RIVER - WILLAMETTE RIVER BRIDGE SEC.

PACIFIC HIGHWAY

MULTNOMAH, WASHINGTON & CLACKAMAS COUNTIES

Reviewed By - Gabriel E. Crop

Designed By - Gwenyth N. Linscheid

Drafted By - Susan K. Wentz

ALIGNMENT & GENERAL CONSTRUCTION

SHEET NO. 29

△2 (1) *Continuously Reinforced Conc. Pvmt Repair - 40 Sq.Yd.*
(For Details, See Shts. 2B, 2B-3 & 2B-5)

(2) *Sta. "ES1" 1321+00 To Sta. "ES1" 1321+40, Rt.*
Remove Extg. Fence - 40'
Const. Type 2 Fence - 40'
Connect To Extg. Fence

(3) *Transition From Grind & Inlay To Overlay*
(For Details, See Sht. 2B-7)

(4) *See Sht. 28A, Note 15*
Remove Extg. Guardrail
Const. Guardrail (Type 2A)
Const. Guardrail Terminal, Flared
Flare Rate = 1:15, W=4', E=2'
Const. Cable Barrier Guardrail Connection
Option 2A

(5) *See Sht. 28A, Note 16*
Remove Extg. Guardrail
Const. Guardrail (Type 2A)
Const. Anchor (Type 1 Mod.)
Inst. End Piece (Type B)
W=1', E=2'

(6) *Sta. "LN2" 1319+50 To Sta. "LN2" 1349+00, Rt.*
Const. Compost Amended Vegetated Filter Strip, 6' Wide
Filter Strip Exc. - 656 Cu.Yd.
Topsoil - 492 Cu.Yd.
Soil Conditioner - 164 Cu.Yd.
Permanent Seeding - 0.41 Ac.
(For Details, See Sht. GJ)

(7) *Sta. "LS2" 1321+00 To Sta. "LS2" 1332+50, Lt.*
Const. Compost Amended Vegetated Filter Strip, 9' Wide
Filter Strip Exc. - 384 Cu.Yd.
Topsoil - 288 Cu.Yd.
Soil Conditioner - 96 Cu.Yd.
Permanent Seeding - 0.24 Ac.
(For Details, See Sht. GJ)

(8) *Sta. "LS2" 1321+59 - 62', Rt.*
Const. 72" Flow Control Manhole
Inst. 15" Sew. Pipe - 60'
10' Depth
Const. 12" Sloped End Section
Const. Paved End Slope
Const. Riprap Basin
Loose Riprap (Class 50) - 2 Cu.Yd.
Const. Culvert Embankment Protection
Loose Riprap (Class 50) - 2 Cu.Yd.
(For Details, See Shts. 2B-19 & 2B-21)
(See Drg. No. RD317)

(9) *Sta. "LS2" 1321+72, Rt.*
Const. Type "G-2" Inlet (Against Barrier)
Inst. 12" Sew. Pipe - 22'
5' Depth

(10) *Sta. "LS2" 1321+68 To Sta. 1323+56*
Inst. Underground Detention Piping
Inst. 48" Sew. Pipe - 188'
20' Depth
Inst. 48" Sew. Pipe - 188'
20' Depth
Inst. 48" Sew. Pipe - 7'
10' Depth
Inst. 24" Sew. Pipe - 9'
10' Depth
(For Details, See Sht. 2B-22)

(11) *Sta. "LS2" 1323+28, Rt.*
Const. Type "G-2" Inlet (Against Barrier)
Inst. 12" Sew. Pipe - 156'
5' Depth

(12) *Sta. "LN2" 1323+66, 57' Rt.*
Const. Pollution Control Manhole
Inst. 18" Sew. Pipe - 10'
20' Depth
(See Drg. No. RD340 & RD356)

(13) *See Sht. 27A, Note 27*
Const. Guardrail (Type 2A)
Const. Anchor (Type 1 Mod.)
Inst. End Piece (Type B)

△1 (14) *See Sht. 28A, Note 24*
Structure No. 21139
Const. Soundwall
(For Drg. Nos., See Sht. 1A)

(15) *Sta. "LS2" 1321+47 To Sta. "LS2" 1350+97, Rt.*
Const. Tall Conc. Shldr. Barrier - 2950'
Anchor Barrier
Flare Rate = 20, W=20', E=0

Rev. No.	Description	Date	Engineer
△1	*Addenda #1 - Structure Reference*	*3/30/09*	*CDA*
△2	*Addenda #4 - Changed Pvmt. Repair Size*	*4/15/09*	*GNL*

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MULTNOMAH, WASHINGTON & CLACKAMAS COUNTIES

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Drafted By - Susan K. Wentz

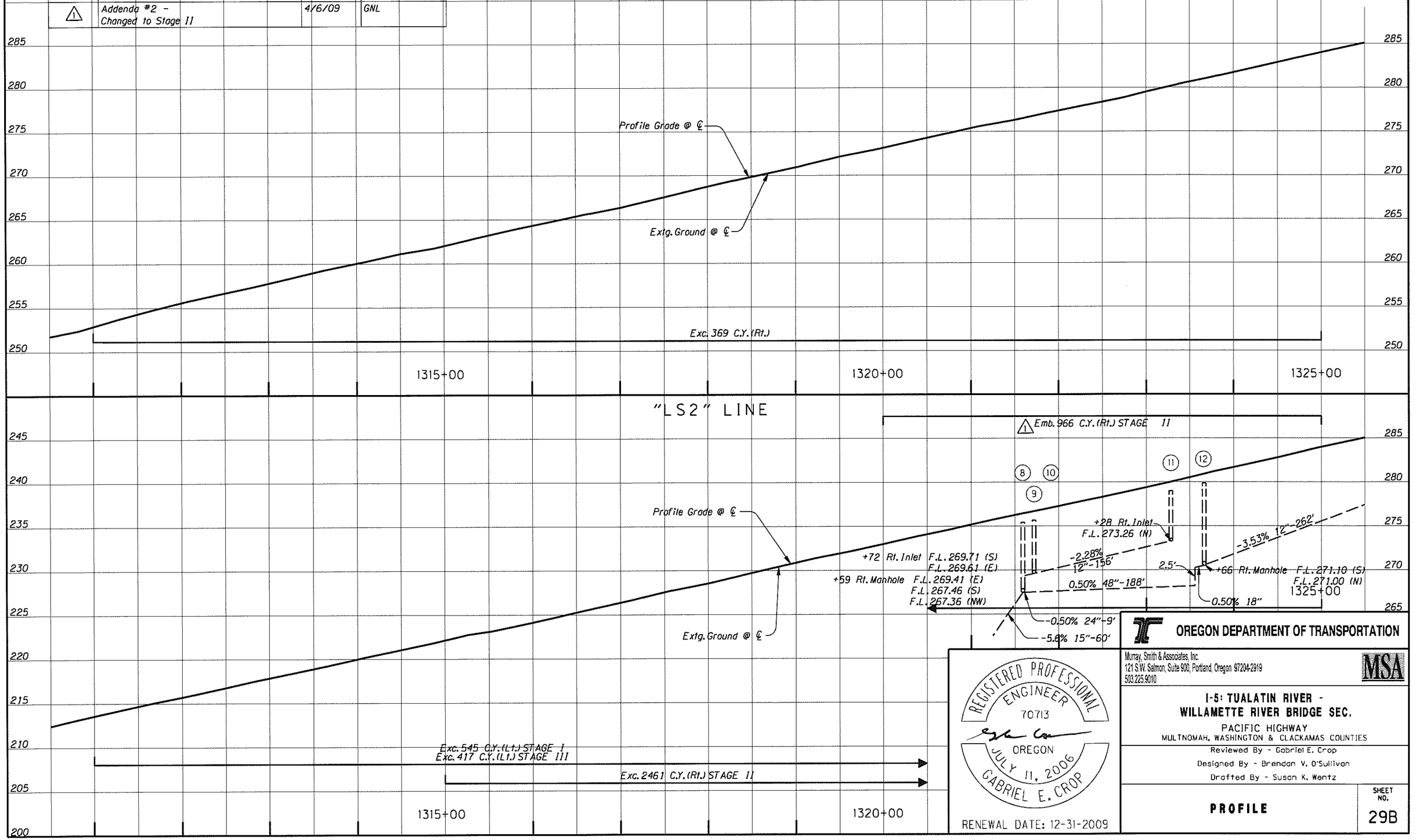
GENERAL CONSTRUCTION

SHEET NO. 29A

42V-31

Rev. No.	Description	Date	Engineer
1	Addenda #2 - Changed to Stage II	4/6/09	GNL

"LN2" LINE



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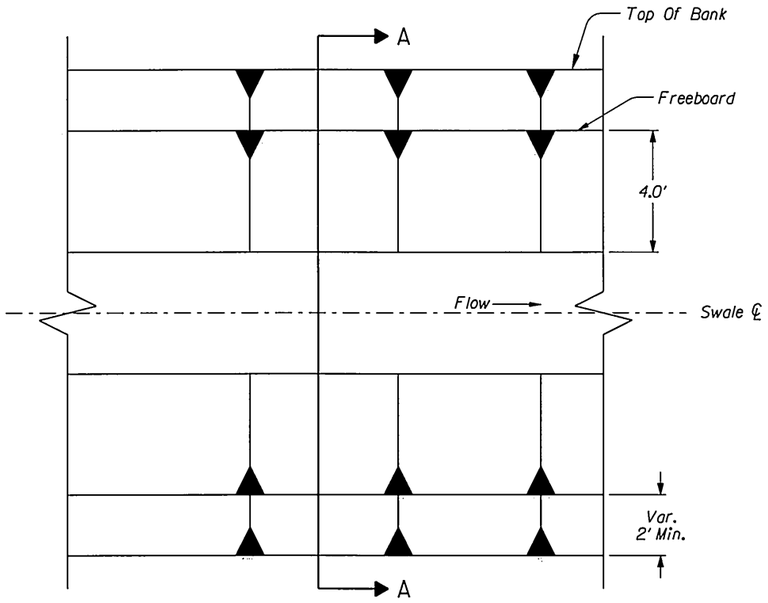
Drafted By - Susan K. Wentz

PROFILE

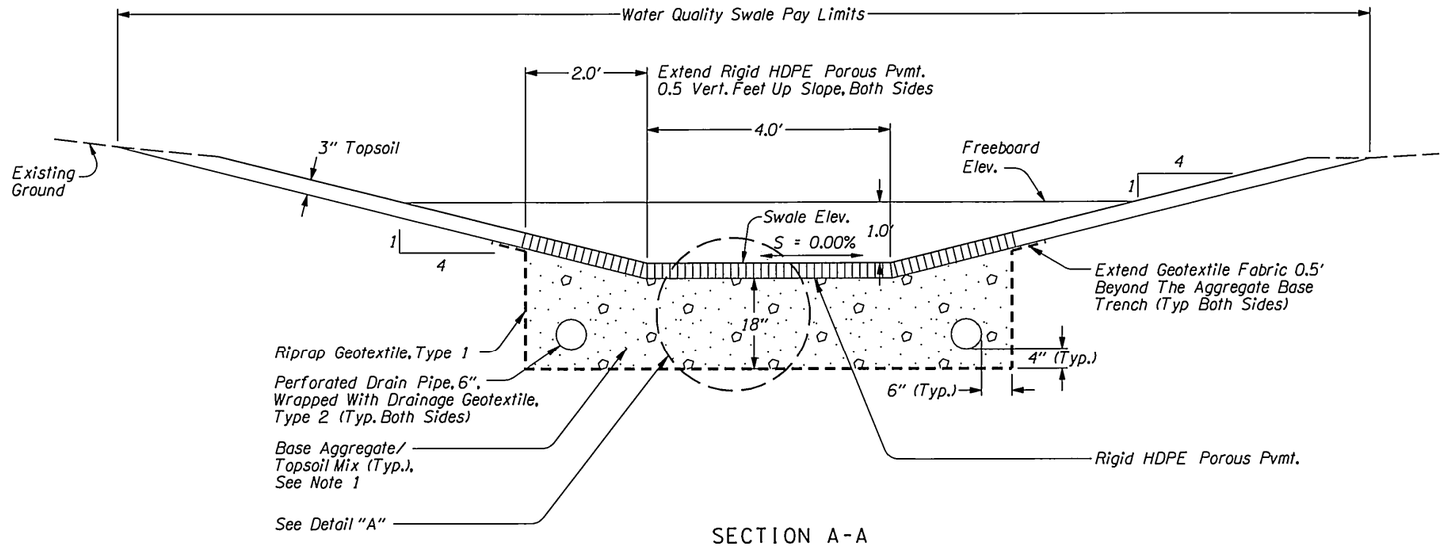
SHEET NO. 29B

G:\05\0784\CAD-4353\CAD\MID\13702-M.PF1 :: Default 4/6/2009 2:16:08 PM GNL

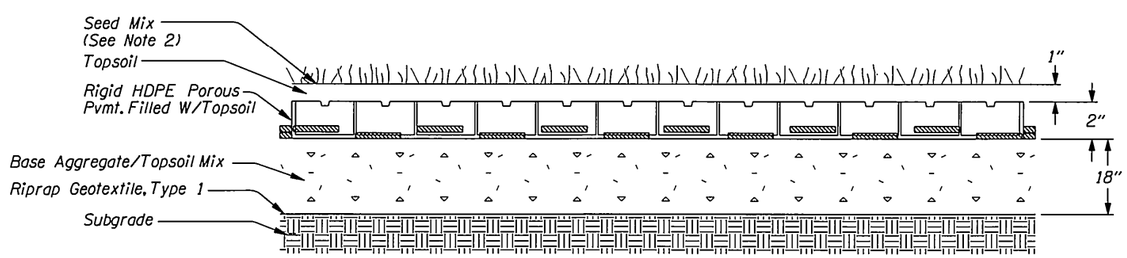
WATER QUALITY SWALE



PLAN
GENERAL SWALE LAYOUT



SECTION A-A
SWALE SOIL STRUCTURE
NTS



DETAIL A

Notes:

1. For Base Aggregate/Topsoil Mix Use Base Aggregate, ¾"-0 Per Sec 00641. & Mix Approx. 50%/50% By Volume With Topsoil Before Placing.

2. Provide Erosion Control Matting And Water Quality Seeding, See Sht. GA.

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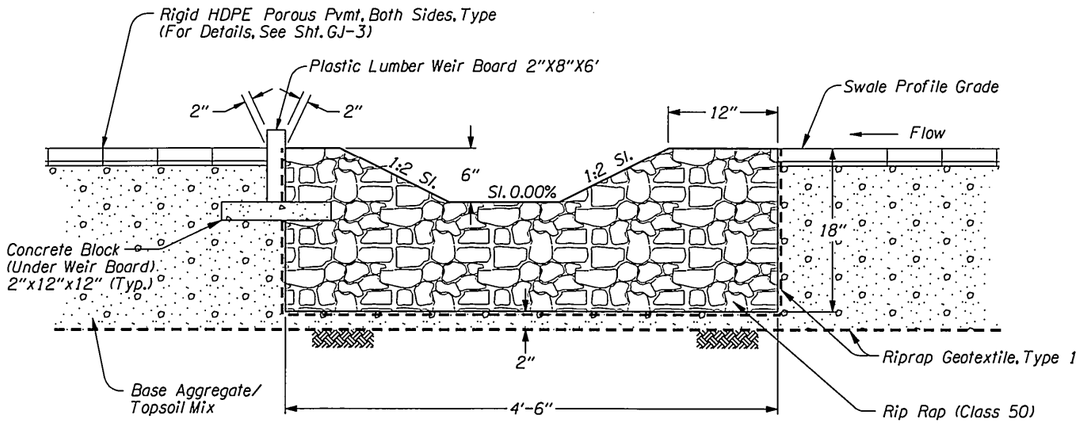
WATER QUALITY DETAILS

SHEET NO.
GJ-3

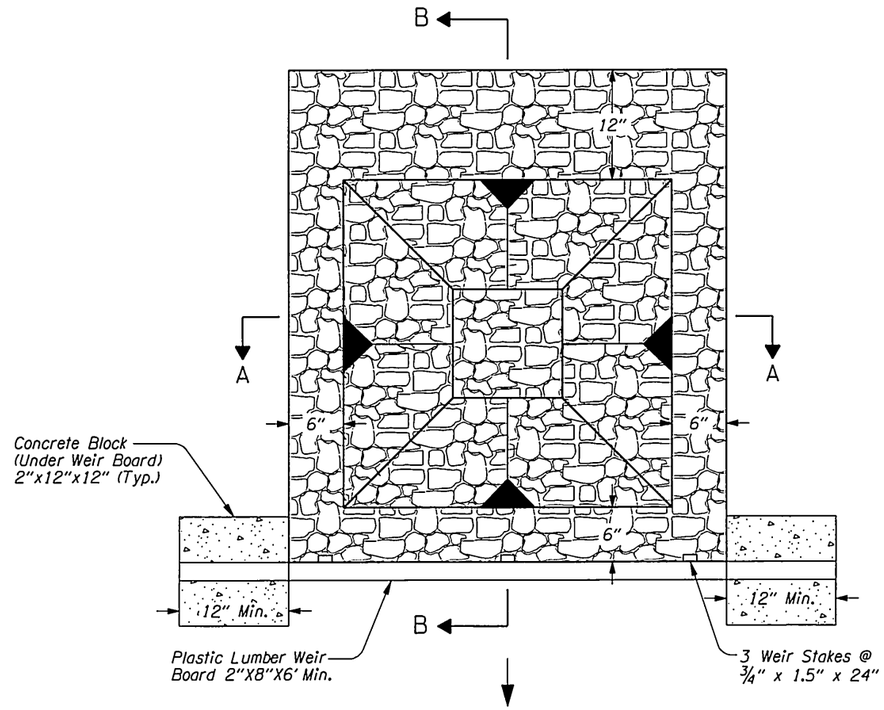
SWALE FLOW SPREADER

Flow Spreader Table

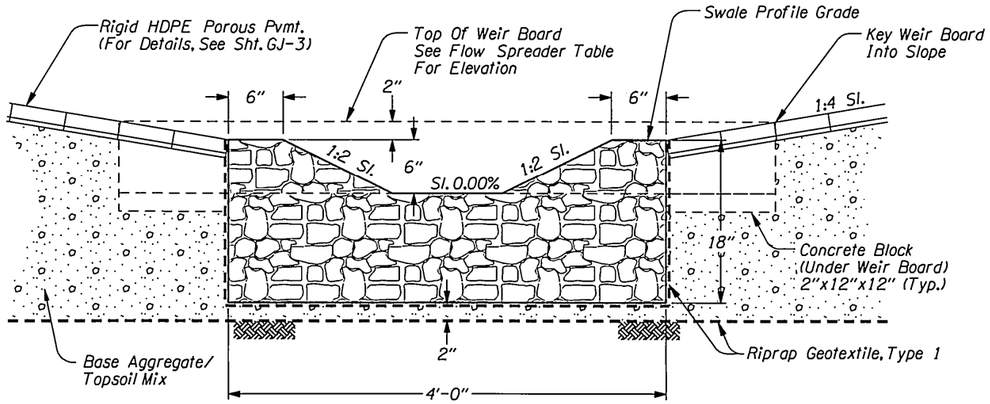
Station	Top Of Weir Board Elev.	Station	Top Of Weir Board Elev.	Station	Top Of Weir Board Elev.
"SWM" 1+45	233.69 ft.	"SWM2" 1+00	186.37 ft.	"SWM3" 1+00	171.17 ft.
"SWM" 1+95	234.69 ft.	"SWM2" 1+50	185.37 ft.	"SWM3" 1+50	170.92 ft.
"SWM" 2+45	235.69 ft.	"SWM2" 2+00	184.37 ft.	"SWM3" 2+00	170.67 ft.
"SWM" 2+95	236.69 ft.	"SWM2" 2+50	183.37 ft.	"SWM3" 2+50	170.42 ft.



SECTION B-B



PLAN



SECTION A-A

OREGON DEPARTMENT OF TRANSPORTATION

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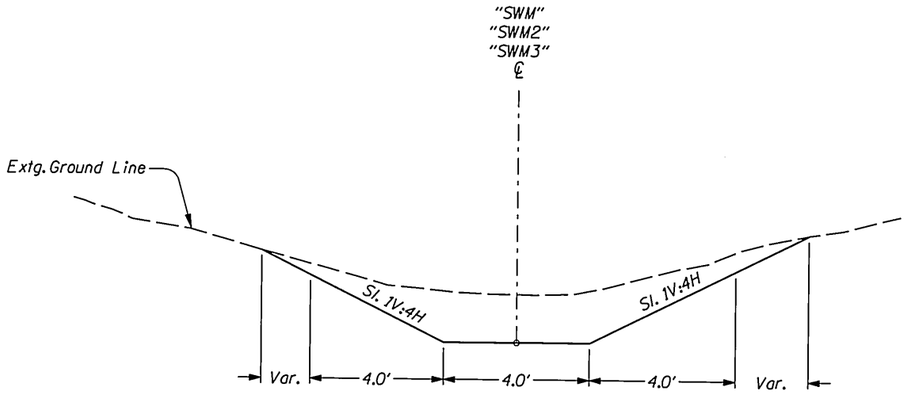
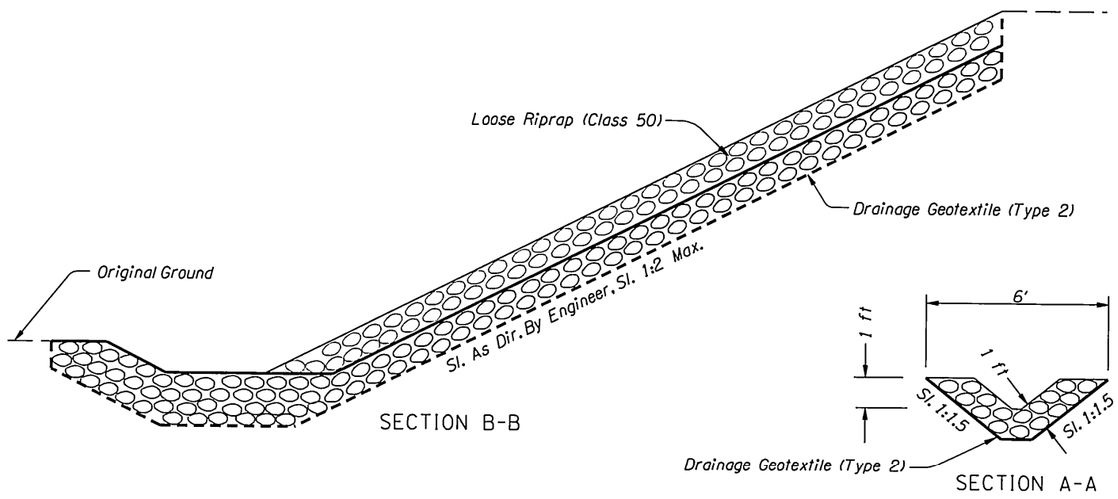
WATER QUALITY DETAILS

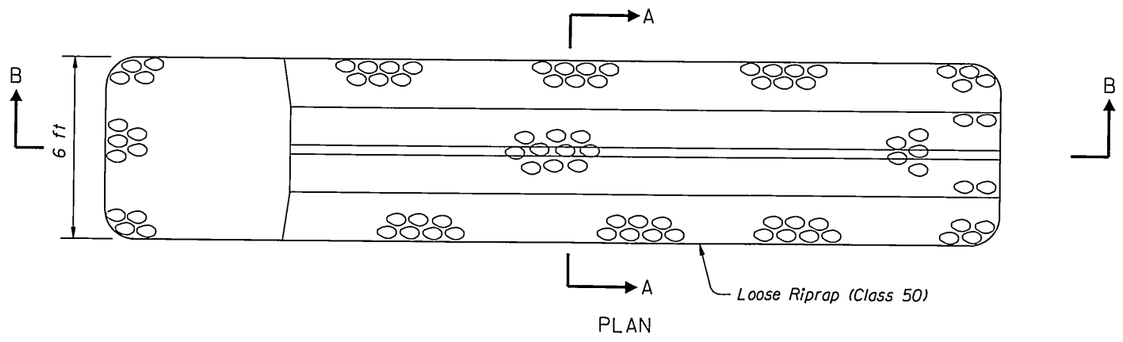
SHEET NO. GJ-4

WATER QUALITY SWALE DETAILS

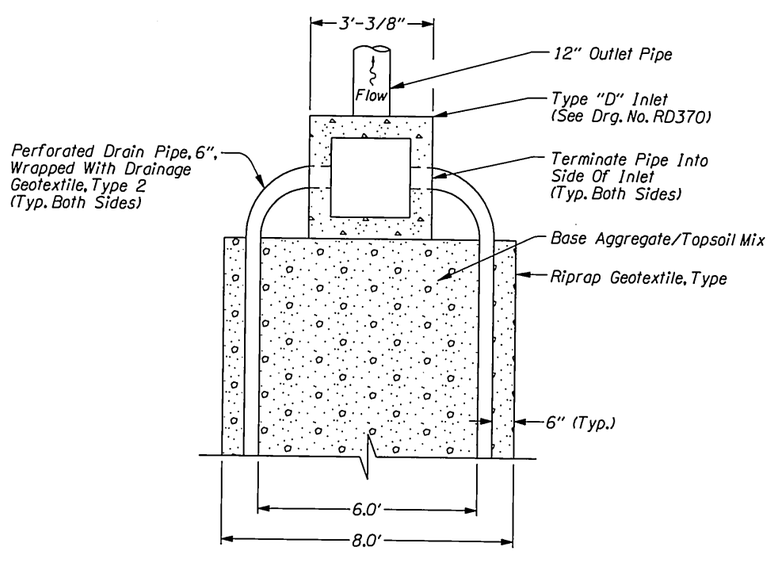


STA. "SWM" 1+00 To STA. "SWM" 2+95
STA. "SWM2" 1+00 To STA. "SWM2" 3+00
STA. "SWM3" 1+00 To STA. "SWM3" 3+00
WATER QUALITY SWALE TYPICAL SECTION





OUTLET PROTECTION
TYPE 5



PERFORATED PIPE CONNECTION
TO TYPE "D" INLET

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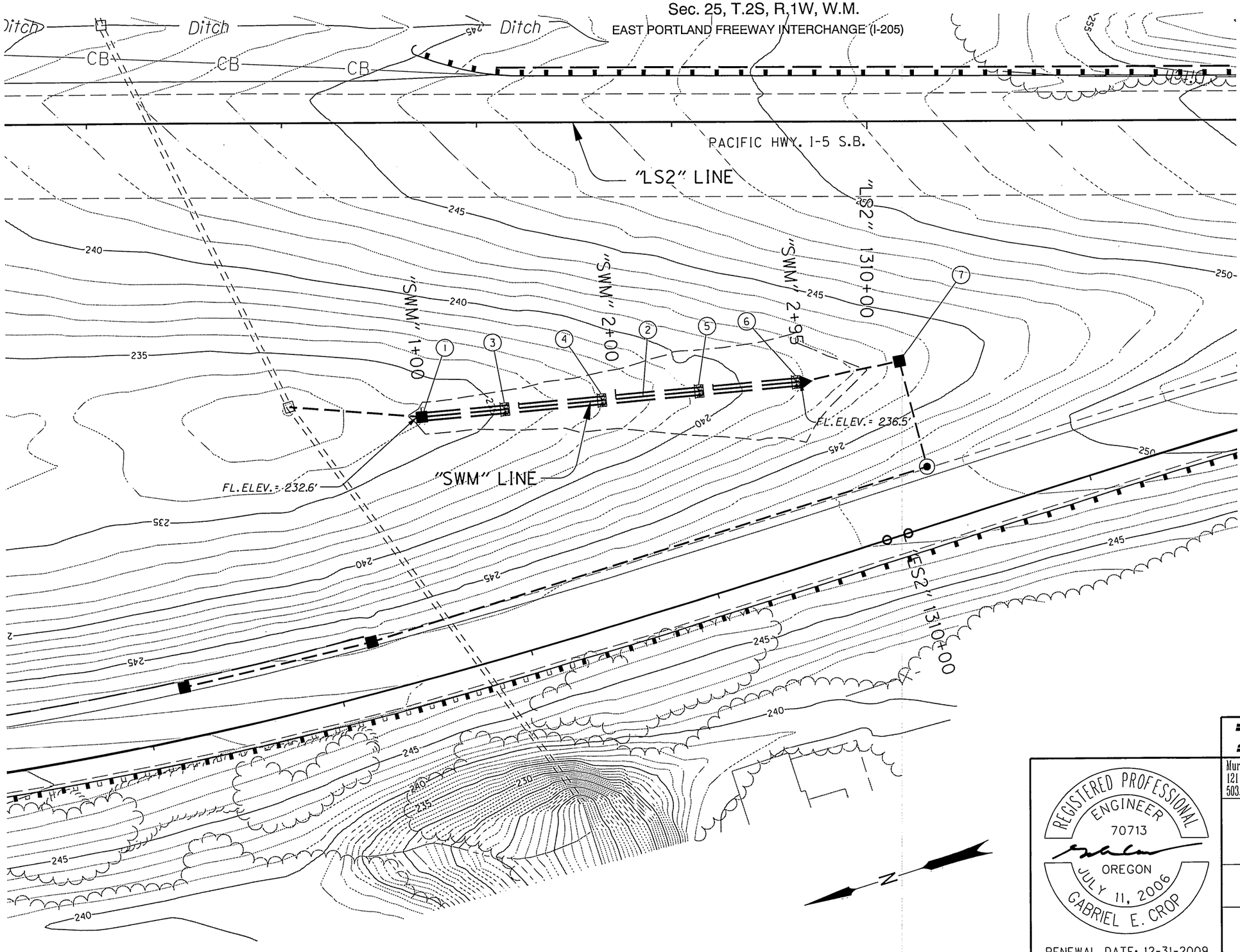
WATER QUALITY DETAILS

SHEET NO.
GJ-5

Sec. 25, T.2S, R.1W, W.M.
EAST PORTLAND FREEWAY INTERCHANGE (I-205)



1. See Sht. 20A, Note 13
2. Sta. "SWM" 1+00 To Sta. "SWM" 2+95
   Const. Water Quality Swale - 195'
   Porous Pvmt. - 174 Sq.Yd.
   Riprap Geotextile, Type 1 - 282 Sq.Yd.
   Base Aggregate - 78 Tons
   Topsoil - 105 Cu.Yd.
   Exc. - 815 Cu.Yd.
   (For Details, See Shts. GA, GJ-3, GJ-4, GJ-5, & GJ-8)
3. Sta. "SWM" 1+45
   Const. Swale Flow Spreader
   Riprap, Class 50 - 1 Cu.Yd.
   Riprap Geotextile, Type 1 - 6 Sq.Yd.
   (For Details, See Sht. GJ-4)
4. Sta. "SWM" 1+95
   Const. Swale Flow Spreader
   Riprap, Class 50 - 1 Cu.Yd.
   Riprap Geotextile, Type 1 - 6 Sq.Yd.
   (For Details, See Sht. GJ-4)
5. Sta. "SWM" 2+45
   Const. Swale Flow Spreader
   Riprap, Class 50 - 1 Cu.Yd.
   Riprap Geotextile, Type 1 - 6 Sq.Yd.
   (For Details, See Sht. GJ-4)
6. Sta. "SWM" 2+95
   Const. Swale Flow Spreader
   Riprap, Class 50 - 1 Cu.Yd.
   Riprap Geotextile, Type 1 - 6 Sq.Yd.
   (For Details, See Sht. GJ-4)
7. See Sht. 20A, Note 14

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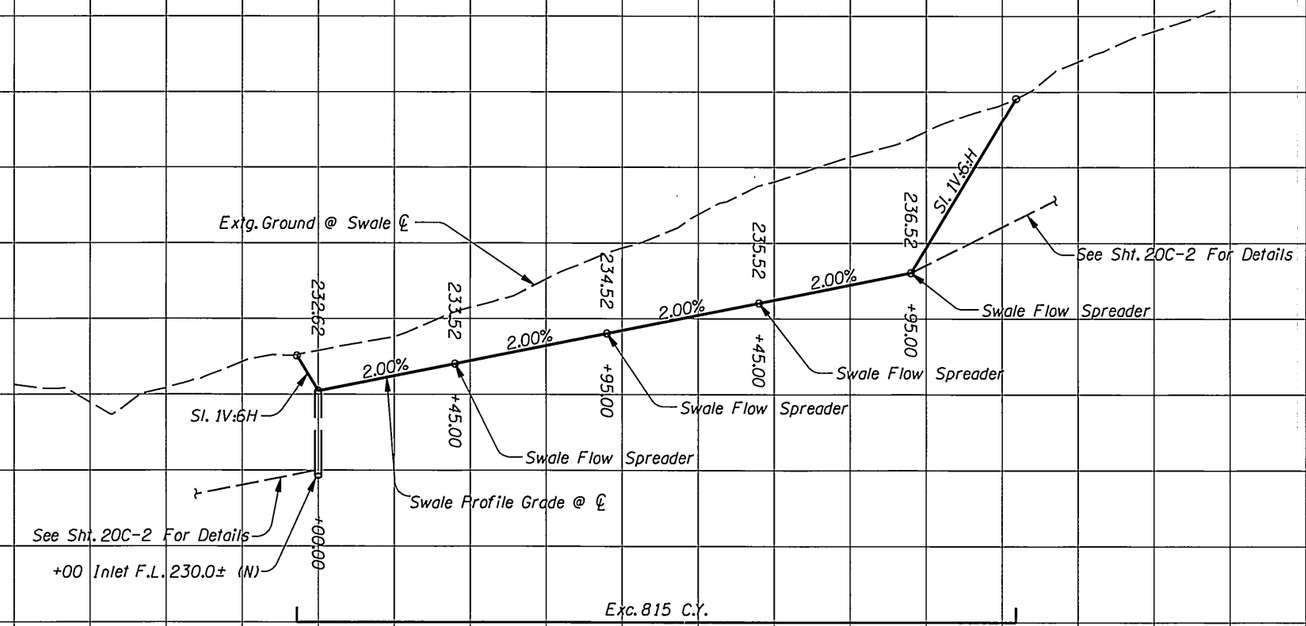
WATER QUALITY PLAN

SHEET NO. GJ-7

"SWM" LINE



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WATER QUALITY PROFILE

SHEET NO. GJ-8