OPERATION & MAINTENANCE MANUAL

DFI No. D00071
Facility Type: Water Quality Biofiltration Swale

June, 2010

INDEX

1. Identification

Drainage Facility ID (DFI):	**D00071**
Facility Type:	Water Quality Biofiltration Swale
Construction Drawings:	(V-File Number) 40V-55
Location:	District: 2B (Old 2A)
	Highway No.: 001
	Mile Post: 292.74 / 292.82 (beg./end)
	Description: This facility is located on the west side of southbound I-5 (Hwy 001) at the junction of the S.W. Dartmouth Street on-ramp, south of the Haines Street Interchange.

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:	ODOT Designer – Region 2 Tech Center, Gabrielle Crop, (503) 986-5838 Consultant Designer – Murray Smith and Associates, Janet Masters, (503) 225-9010
Facility construction:	2008
Contractor:	Morse Bros., Inc. DBA Knife River, Tangent, OR

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.

The water quality biofiltration swale is approximately 400-feet and is located on the west side of I-5 (Hwy 001) just south of the Haines Street Interchange.

Drainage from the southbound lanes of the highway and a portion of the on-ramp is collected by a series of inlets and directed to the swale. See the Operational Plan in Appendix A. The stormwater is then treated by flowing through the swale. Flow spreaders are located approximately every 100-feet to control the velocities and minimize channelization or rutting of the swale bottom; see Photo 1 and Appendix B for the construction drawings. The swale bottom is lined with a rigid HDPE porous pavement system and geotextile fabric that additionally protects against erosion.

There are a total of two storm pipes that drain into this water quality swale. These pipes outfall into the swale at points A and B in the Operational Plan; see Appendix A. Treated water from this swale is collected by a ditch inlet, (indicated as point C in the Operational Plan), and conveyed into a 36-inch buried storm pipe detention system (DFI No. D00072) that ultimately discharges to a roadside ditch approximately 570 feet from the swale.

Photo 1: WQ Biofiltration Swale looking north. I-5 is located to the right.

Photo 2: Inlet B midsection of swale.

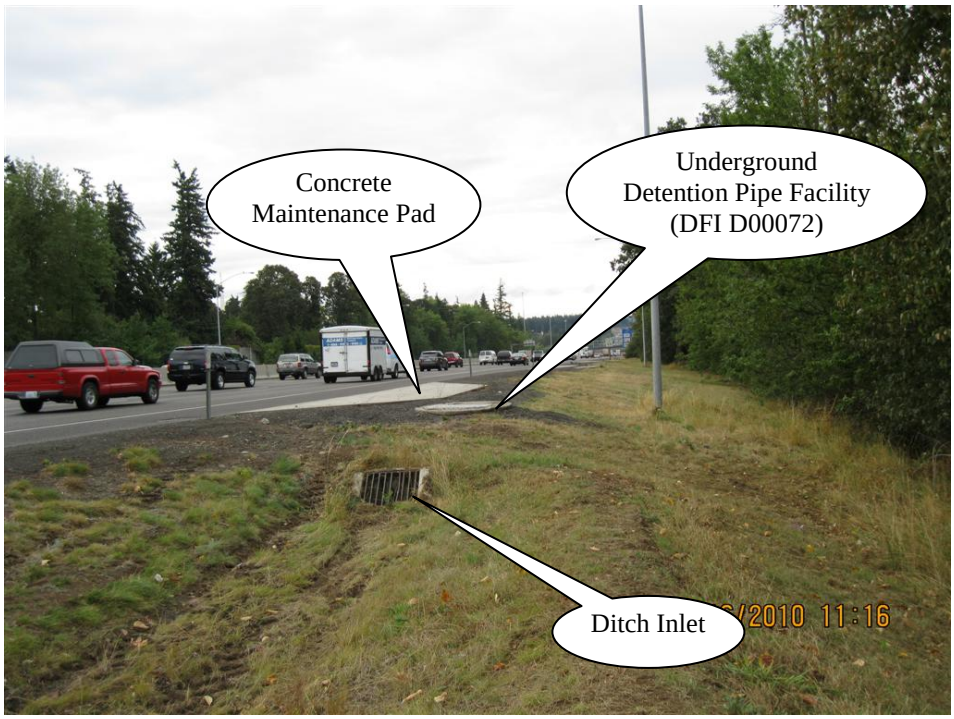


Photo 3: Ditch Inlet serves as outlet of swale.

For further information and details regarding the system refer to Appendix A for the Operational Plan and Appendix B for the Construction Project Plan sheets.

A. Maintenance equipment access:
The facility can be accessed for maintenance along the entire length via Interstate-5 (Hwy 001). Photo 3 includes a concrete maintenance pad intended for maintenance vehicles.

B. Heavy equipment access into facility:

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

C. Special Features:

☐ Amended Soils
☒ Porous Pavers
☒ Liners (Riprap and Drainage Geotextile)
☒ Underdrains

5. Facility Haz Mat Spill Feature(s)

The water quality biofiltration swale is considered an online system (no flow is bypassed) and can be used to store a volume of liquid by blocking the facility outlet at either the grate of the ditch inlet, or the 12-inch diameter pipe (located within the inlet/outlet structure itself). This pipe is noted as point C in the Operation Plan.

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
This swale does not contain an auxiliary outlet or overflow.

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 or 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

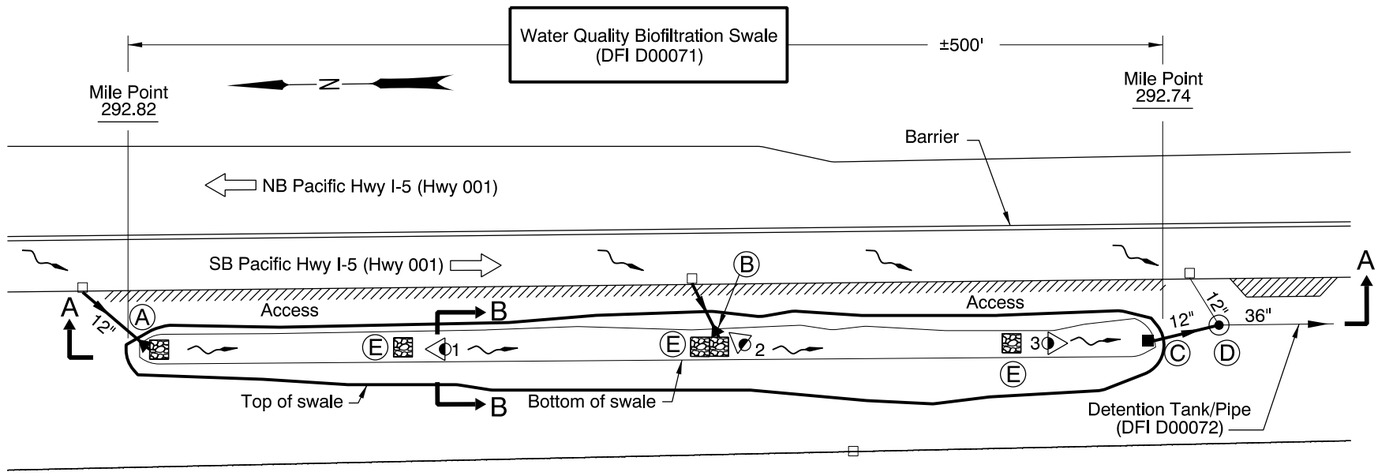
Contact any of the following for more detailed information about management of waste materials found on site:

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

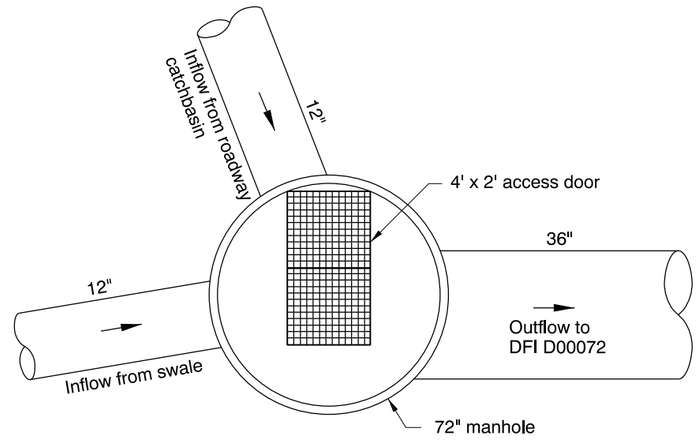
Appendix A

Content:

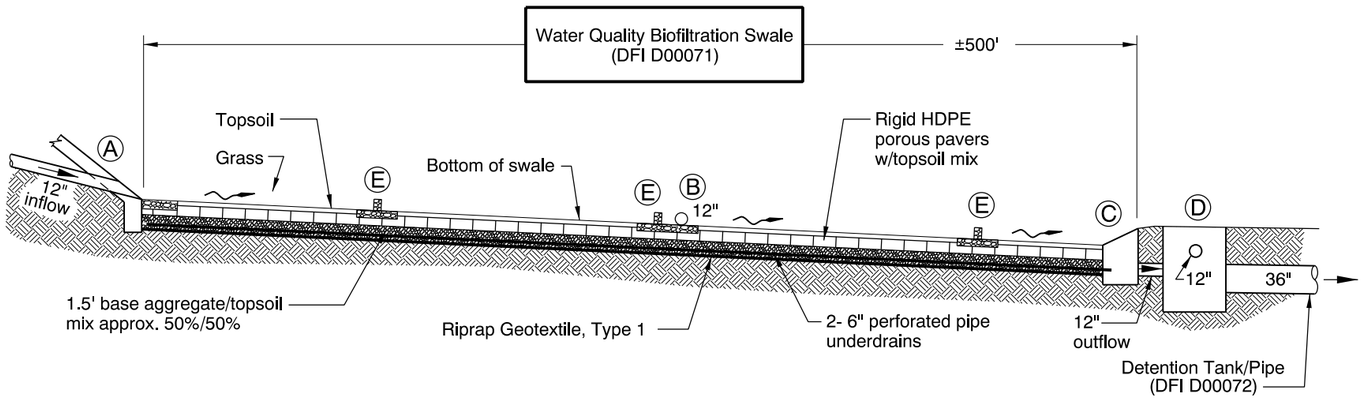
- **Operational Plan and Profile Drawing(s)**



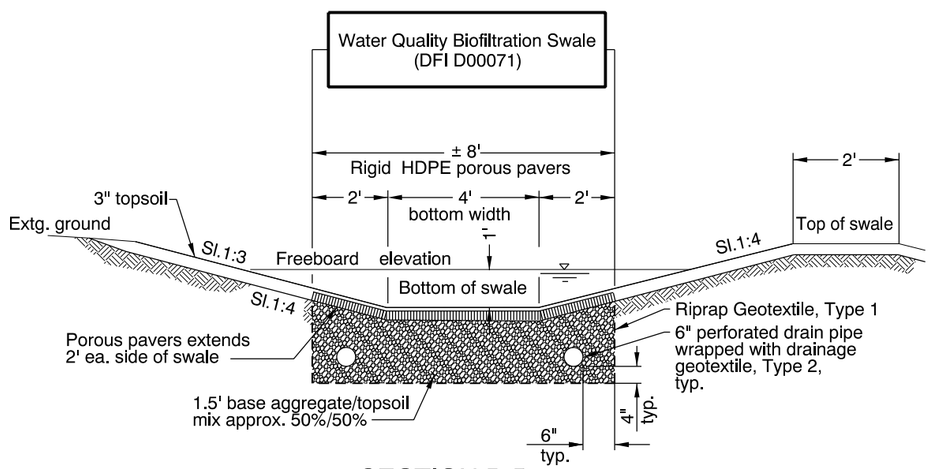
PLAN
N.T.S.



72" MANHOLE AT POINT Ⓓ
N.T.S.



SECTION A-A
N.T.S.



SECTION B-B
N.T.S.

LEGEND:

- Photo Location / Direction
- Ⓐ Ⓑ Facility inlet - 12" Pipe With Paved End Slope And Flow Spreader
- Ⓒ Swale Outlet/Type "D" Inlet
- Ⓓ 72" Manhole
- Ⓔ Swale Flow Spreader
- ◉ and or ◎ Manhole
- ■ and or □ Inlet
- Traffic Flow/Direction
- Storm Pipe (Facility)
- Storm Pipe
- Conveyance Direction
- Pavement / Facility Flow Path
- Riprap
- ▲ Paved Slope Inlet
- Maintenance Access

Sht. 1 of 1

OREGON DEPARTMENT OF TRANSPORTATION

Prepared By: Bob Knorr

Drafted By: Dan Claycomb

DFI D00071
MAINTENANCE DISTRICT 2B HWY 001
WATER QUALITY BIOFILTRATION SWALE
PACIFIC HWY MP 292.82-292.74
MULTNOMAH, WASHINGTON & CLACKAMAS COUNTIES

Appendix B

Content:

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

40V-55

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

REVISED AS CONSTRUCTED
1/15/08 CONTRACT 13351
PROJ. MGR. BILL EDMUNSON

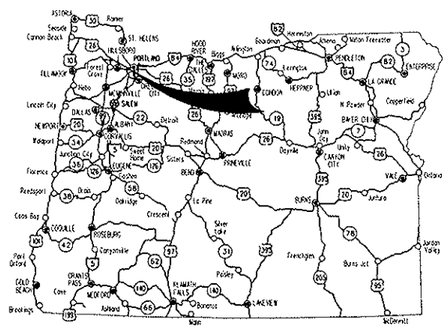
STATE OF OREGON
DEPARTMENT OF TRANSPORTATION
PLANS FOR PROPOSED PROJECT

GRADING, DRAINAGE, STRUCTURES, PAVING & SIGNALS

I-5: CAPITOL HWY - TUALATIN RIVER SEC.

PACIFIC HIGHWAY

MULTNOMAH, WASHINGTON & CLACKAMAS COUNTIES
MARCH 2007

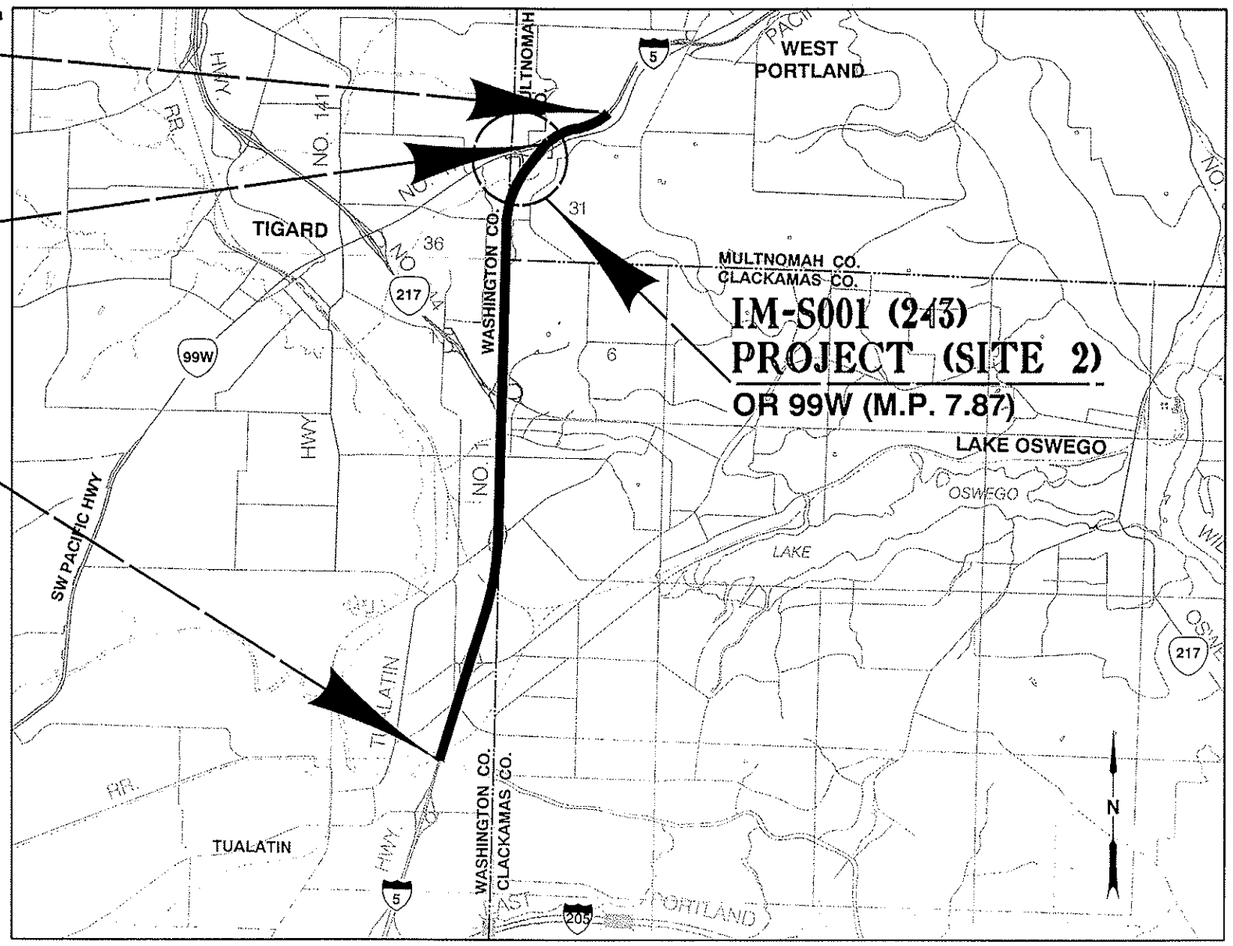


Overall Length Of Project - 4.51 Miles

IM-S001 (243)
BEGINNING OF CONTRACT
STA. "L2" 989+45 (M.P. 294.25)

IM-S001 (243)
BEGINNING OF PAVING
STA. "L2" 990+52 (M.P. 294.19)

IM-S001 (243)
END OF PROJECT
STA. "LN2" 1226+00 (M.P. 289.74)
STA. "LS2" 1226+00



RECORD DRAWINGS

THIS DRAWING IS FOR RECORD PURPOSES ONLY, AND HAS BEEN PREPARED BASED IN PART ON INFORMATION PROVIDED BY OTHERS RELATIVE TO REPORTED CONSTRUCTED CONDITIONS. WHILE THIS INFORMATION IS BELIEVED TO BE RELIABLE, MURRAY, SMITH & ASSOCIATES, INC. MAKES NO ASSURANCES, STATED OR IMPLIED, AS TO THE ACCURACY OF THIS DRAWING. THOSE RELYING ON THIS RECORD DRAWING FOR ANY PURPOSE ARE ADVISED TO OBTAIN INDEPENDENT VERIFICATION OF ITS ACCURACY. CONTRACT MODIFICATION INFORMATION, FABRICATOR'S SHOP DRAWINGS AND OTHER PROJECT SUBMITTAL INFORMATION PROVIDED BY THE CONTRACTOR WHICH FURTHER CLARIFY DETAILS OF CONSTRUCTION MAY BE ON FILE. SEE ORIGINAL CONTRACT DRAWINGS FOR ENGINEER'S SEAL AND SIGNATURES.

VERSION 4.0 12-9-97

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

Stuart Foster	CHAIRMAN
Gail L. Achterman	COMMISSIONER
Mike Nelson	COMMISSIONER
Randall Papé	COMMISSIONER
Janice J. Wilson	COMMISSIONER
Matthew L. Garrett	DIRECTOR OF TRANSPORTATION

PLANS PREPARED FOR
ODOT
BY:
Murray, Smith & Associates, Inc.

REGISTERED PROFESSIONAL ENGINEER
16,589
ORIGINAL SIGNED BY
OREGON
JULY 20, 1993
TROY L. BOWERS
Expires Dec. 31, 2007

OREGON DEPARTMENT OF TRANSPORTATION
CONCURRENCE

CHIEF ENGINEER — DATE

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

FEDERAL HIGHWAY ADMINISTRATION	PROJECT NUMBER	SHEET NO.
OREGON DIVISION	IM-S001 (243)	1

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

G:\07\0871\310\CAD\DOR\13252cover.tsl :: Default 4/10/2008 3:11:24 PM SKW

1:1200 - 1

HAINES ST. INTERCHANGE

40V-55

REVISED AS CONSTRUCTED
1/15/08 CONTRACT 13351

N

"HN2" LINE

"HN2" 240.00' Sp. S 14°24'00" a 5.00

"HN2" 1059+50.73 P.O.T.

"HN2" 1060+00.00

"HN2" 1060+35.73 P.O.T. "L2" 1060+35.73 P.O.T. (5.45' Lt.)

"L2" LINE

"L2" 1065+00.00

"L2" 1070+00

S.5°25'00"W.

S.1°14'58"W.

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

Sec. 6, T. 2S, R. 1E, W.M.

PACIFIC HWY. I-5 N.B.

PACIFIC HWY. I-5 S.B.

S.1°13'00"E.

"HS2" LINE

"HS2" 1060+00

"HS2" 1062+75.73 P.O.T. "L2" 1062+75.73 P.O.T. (45.58' Rt.)

12"-36'

36"-194'

36"-196'

12"-180'

No Work Zone Shown Thus:

OREGON DEPARTMENT OF TRANSPORTATION

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

RENEWAL DATE: 12-31-2007

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

MSA

I-5: CAPITOL HWY -
TUALATIN RIVER SEC.

PACIFIC HIGHWAY
MULTNOMAH, WASHINGTON & CLACKAMAS COUNTIES

Reviewed By - Gabriel E. Crop
Designed By - E. Michael Kebbe
Drafted By - Susan K. Wentz

ALIGNMENT & GENERAL CONSTRUCTION

SHEET NO. 8

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1/15/08 CONTRACT 13351

(1) *See Sht. 6A. Note 7*
Const. Reflectorized Tall Conc. Median Barrier
Anchor Barrier To Roadway Using Vertical Anchor Rods

(2) *Sta. "L2" 1060+08 To Sta. "L2" 1082+14*
Const. Reflectorized Tall Conc. Median Barrier - 2200'
Anchor Barrier To Roadway Using Vertical Anchor Rods

(3) *Sta. "L2" 1067+95, Lt.*
Remove Extg. Earth Mound - 60 C.Y.
Inst. Impact Attenuator
(For Details, See Sht. 2B-13)

(5) *Overlap Barrier Around Extg. Obstacle*
(For Details, See Sht. 2B-11)

(8) *Sta. "L2" 1071+31 - 76' Rt.*
Const. Manhole 72" Dia.
Rim Elev. = 269.83 +/-
Inst. 12" Sew. Pipe - 180'
10' Depth
(See Drg. Nos. RD316 & RD318)
(For Details, See Shts. GJ-4 & GJ-5)

(9) *Sta. "L2" 1063+05 - 90' Rt.*
Remove Extg. 12" Pipe - 10'
Const. Paved End Slope
(See Drg. No. RD320)
(For Details, See Sht. GJ-2)

(10) *Sta. "L2" 1065+32 - 84' Rt.*
Remove Extg. 12" Pipe - 4'
Const. Paved End Slope
(For Details, See Sht. GJ-2)

(11) *Sta. "L2" 1067+05 - 79' Rt.*
Const. Type "D" Inlet
Inst. 12" Sew. Pipe - 36'
10' Depth
(See Drg. No. RD370)

(12) *Sta. "L2" 1067+40 - 75' Rt.*
Const. Manhole 72" Dia.
Rim Elev. = 282.20 +/-
Connect To Extg. 12" Sew. Pipe (NE)
Inst. 36" Storm Sew. Pipe - 194'
20' Depth
(For Details, See Sht. GJ-4)

(13) *Sta. 1069+34 - 75' Rt.*
Const. Manhole 72" Dia.
Rim Elev. = 276.10 +/-
Inst. 36" Sew. Pipe - 197'
10' Depth
Connect To Proposed Manhole (N)
(For Details, Shts. GJ-4 & GJ-6)

(14) *Const. Conc. Maintenance Pad - 3*
(See Drg. No. TM434)

(15) *Const. Water Quality Swale*
(For Drg. Nos., See Sht. 1A)

REGISTERED PROFESSIONAL ENGINEER
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JULY 11, 2006
GABRIEL E. CROP

RENEWAL DATE: 12-31-2007

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I-5: CAPITOL HWY - TUALATIN RIVER SEC.

PACIFIC HIGHWAY
MULTNOMAH, WASHINGTON & CLACKAMAS COUNTIES

Reviewed By - Gabriel E. Crop
Designed By - E. Michael Kebbe
Drafted By - Susan K. Wentz

GENERAL CONSTRUCTION

SHEET NO. 8A

"L2" LINE PROFILE

(For Location, See Sht. 8)

NORTHBOUND

40V-55

REVISED AS CONSTRUCTED 1/15/08 CONTRACT 13351

325
320
315
310
305
300
295
290
285
280
275
270
265
260
255
250
245

Extg. Ground @ ℄

Profile Grade @ 30' Lt.

Extg. Ground @ 30' Lt.

"L2" 1060

"L2" 1065

"L2" 1070

OREGON DEPARTMENT OF TRANSPORTATION

REGISTERED PROFESSIONAL ENGINEER
77658
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JULY 11, 2006
JANET E. MASTERS

RENEWAL DATE: 12-31-2008

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121 S.W. Salmon, Suite 900, Portland, Oregon 97204-2919
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I-5: CAPITOL HWY - TUALATIN RIVER SEC.

PACIFIC HIGHWAY

MULTNOMAH, WASHINGTON & CLACKAMAS COUNTIES

Reviewed By - Janet E. Masters

Designed By - E. Michael Kebbe

Drafted By - Harry C. Marx

PROFILE

SHEET NO. 8B

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"L2" LINE PROFILE

(For Location, See Sht. 8)

SOUTHBOUND

40V-55

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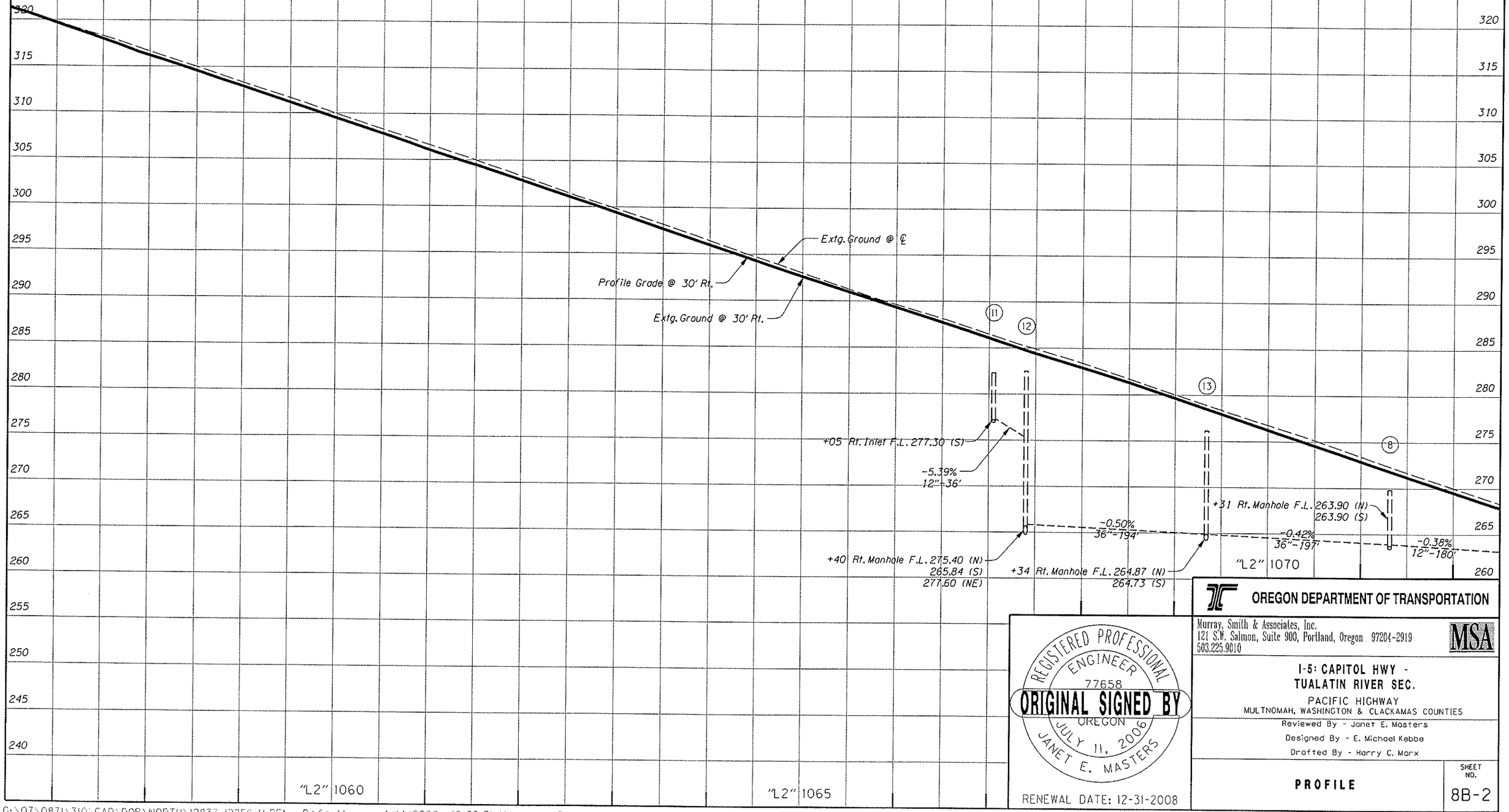
1/15/08 CONTRACT 13351



REGISTERED PROFESSIONAL ENGINEER
77658
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OREGON
JULY 11, 2006
JANET E. MASTERS

RENEWAL DATE: 12-31-2008

OREGON DEPARTMENT OF TRANSPORTATION

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

MSA

I-5: CAPITOL HWY -
TUALATIN RIVER SEC.

PACIFIC HIGHWAY
MULTNOMAH, WASHINGTON & CLACKAMAS COUNTIES

Reviewed By - Janet E. Masters
Designed By - E. Michael Kebbe
Drafted By - Harry C. Marx

PROFILE

SHEET NO. 8B-2

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S. TIGARD INTERCHANGE

40V-55

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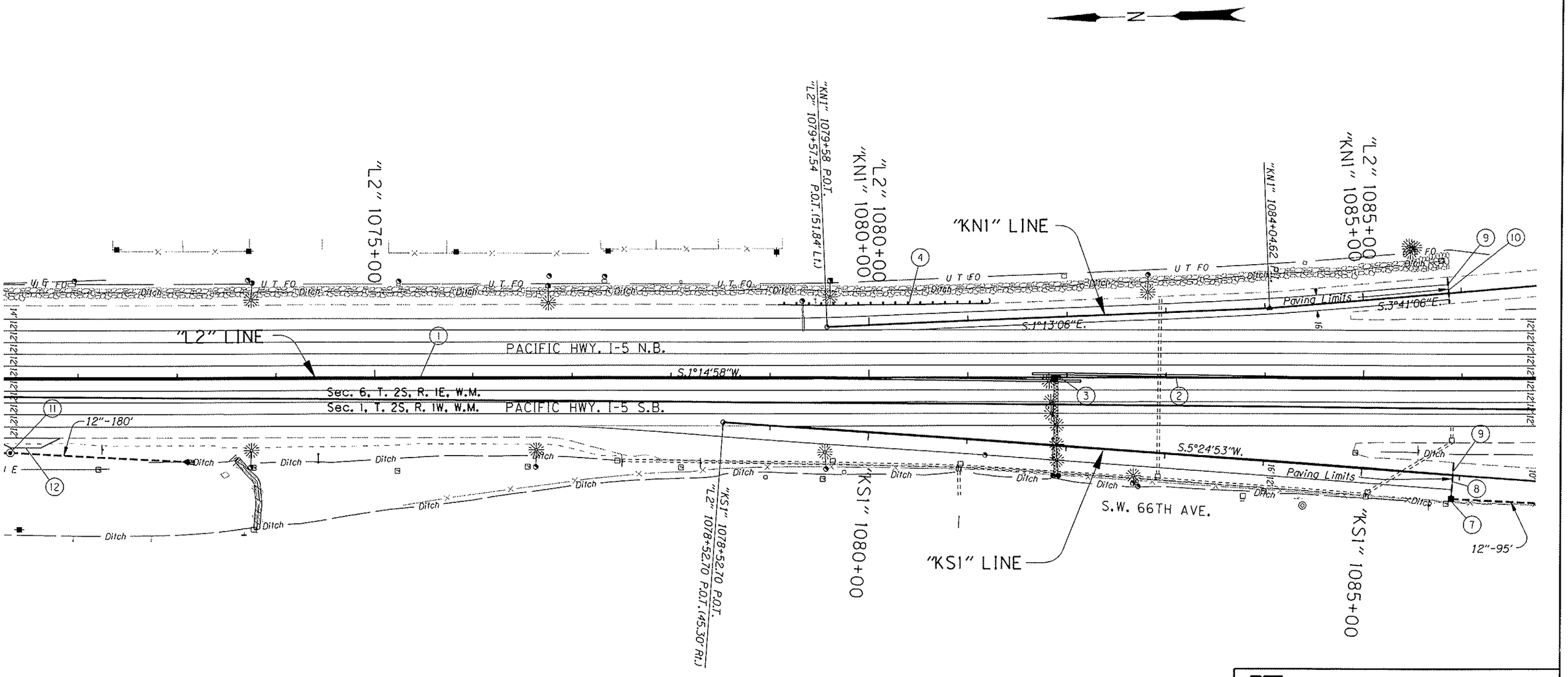
1/15/08 CONTRACT 13351



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JULY 11, 2006
GABRIEL E. CROP

RENEWAL DATE: 12-31-2007

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Murray, Smith & Associates, Inc.
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MSA

I-5: CAPITOL HWY -
TUALATIN RIVER SEC.

PACIFIC HIGHWAY
MULTNOMAH, WASHINGTON & CLACKAMAS COUNTIES

Reviewed By - Gabriel E. Crop
Designed By - Jeremiah D. Hess
Drafted By - Susan K. Wentz

ALIGNMENT & GENERAL CONSTRUCTION

SHEET NO. 9

REVISED AS CONSTRUCTED
1/15/08 CONTRACT 13351

(1) *See Sht. 8A, Note 2*
Const. Reflectorized Tall Conc. Median Barrier
Anchor Barrier To Roadway Using Vertical Anchor Rods

(2) *Sta. "L2" 1081+65 To Sta. "L2" 1101+40*
Const. Reflectorized Tall Conc. Median Barrier - 1975'
Anchor Barrier To Roadway Using Vertical Anchor Rods

(3) *Overlap Barrier Around Extg. Obstacle*
(For Details, See Sht. 2B-11)

(4) *Sta. "L2" 1079+08 To Sta. "KN1" 1081+21, Lt.*
Const. Guardrail - 175' (Type 2A)
Const. Anchor (Type 1 Mod)
Inst. End Piece (Type B)
Const. Guardrail Terminal, Non-Flared
W=1, E=0
(See Drg. Nos. RD400, RD405, RD410, RD415, RD420 & RD450)

(7) *Sta. "L2" 1085+90, Rt.*
Const. Type "G-2" Inlet
Inst. 12" Sew. Pipe - 93'
5' Depth
Connect To Extg. Inlet (N)
Connect To Extg. Perf. Pipe
Const. Open Grade HMAC Inlet Mod.

(8) *Inst. Wearing Surface Drain - 40'*
Option "A" Outlet To Inlet

(9) *Transition To Extg. Pvmt.*

(10) *Inst. Wearing Surface Drain - 26'*
Option "B" Outlet To Ditch

△1 (11) *See Sht. 8A, Note 8*
Const. 72" Dia. Manhole
Inst. 12" Sew. Pipe
10' Depth
Const. Paved End Slope
Const. Loose Riprap (Class 50) - 2 C.Y.
Inst. Drainage Geotextile, Type 2 - 7 Sq. Yd.
(For Details, See Shts. GJ-4 & GJ-5)

(12) *See Sht. 8A, Note 14*
Const. Conc. Maintenance Pad

Rev. No.	Description	Date	Engineer
△1	Addenda #1 - Format Note #11	2/26/07	JDH

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

RENEWAL DATE: 12-31-2007

OREGON DEPARTMENT OF TRANSPORTATION

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

MSA

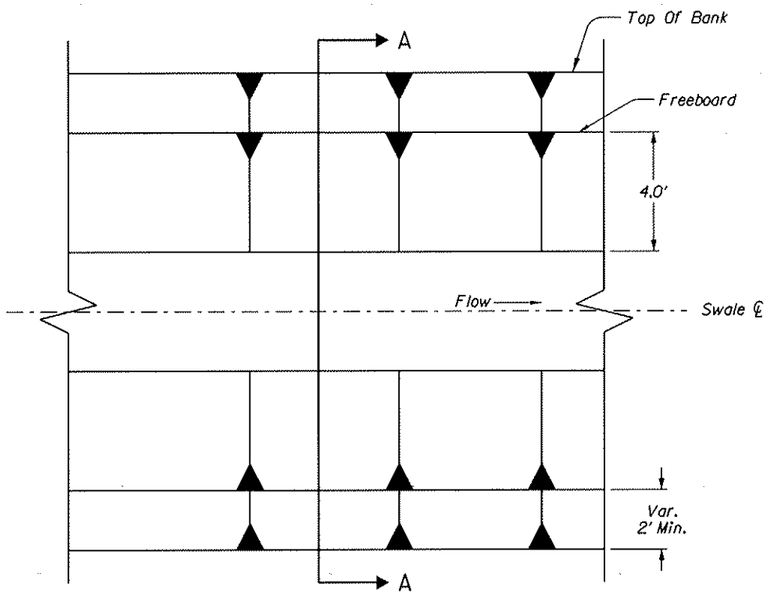
I-5: CAPITOL HWY -
TUALATIN RIVER SEC.
PACIFIC HIGHWAY
MULTNOMAH, WASHINGTON & CLACKAMAS COUNTIES

Reviewed By - Gabriel E. Crop
Designed By - Jeremiah D. Hess
Drafted By - Susan K. Wentz

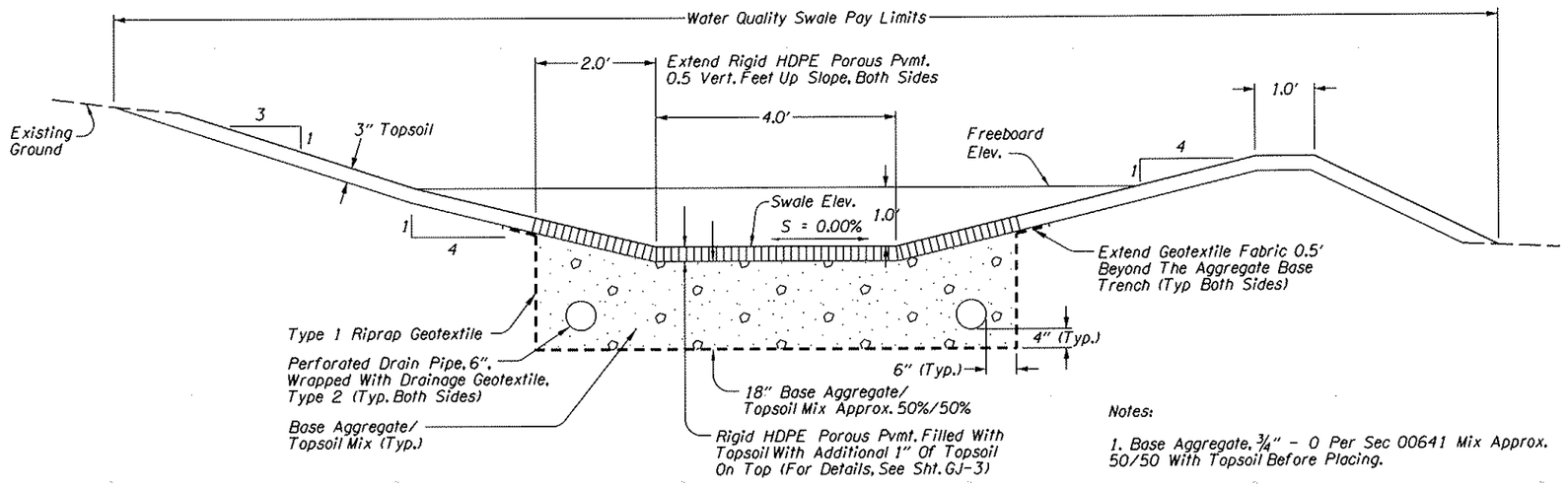
GENERAL CONSTRUCTION

SHEET NO. 9A

REVISED AS CONSTRUCTED
1/15/08 CONTRACT 13351



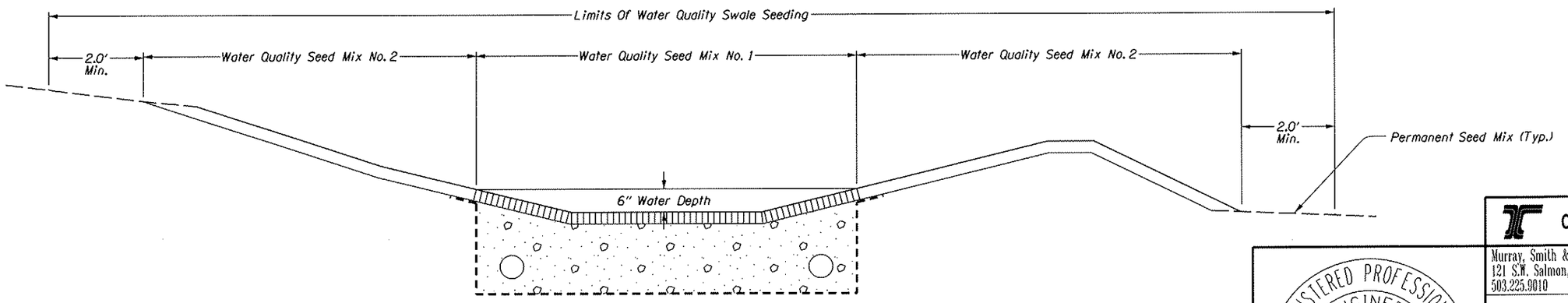
PLAN
GENERAL SWALE LAYOUT



SECTION A-A
SWALE SOIL STRUCTURE
NTS

Notes:

1. Base Aggregate, ¾" - 0 Per Sec 00641 Mix Approx. 50/50 With Topsoil Before Placing.



SECTION A-A
SWALE SEEDING LIMITS
(For Seed Mix Details, See Specs.)

REGISTERED PROFESSIONAL ENGINEER
77658
ORIGINAL SIGNED BY
OREGON
JULY 11, 2006
JANET E. MASTERS

RENEWAL DATE: 12-31-2008

OREGON DEPARTMENT OF TRANSPORTATION

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

MSA

I-5: CAPITOL HWY - TUALATIN RIVER SEC.

PACIFIC HIGHWAY
MULTNOMAH, WASHINGTON & CLACKAMAS COUNTIES

Reviewed By - Janet E. Masters
Designed By - Brendan V. O'Sullivan
Drafted By - Harry C. Marx

WATER QUALITY DETAILS

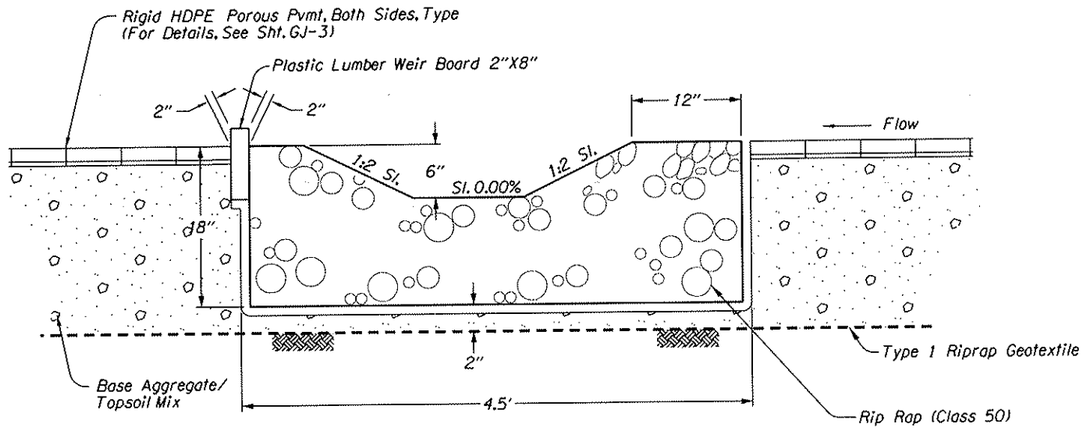
SHEET NO. GJ

REVISED AS CONSTRUCTED
1/15/08 CONTRACT 13351

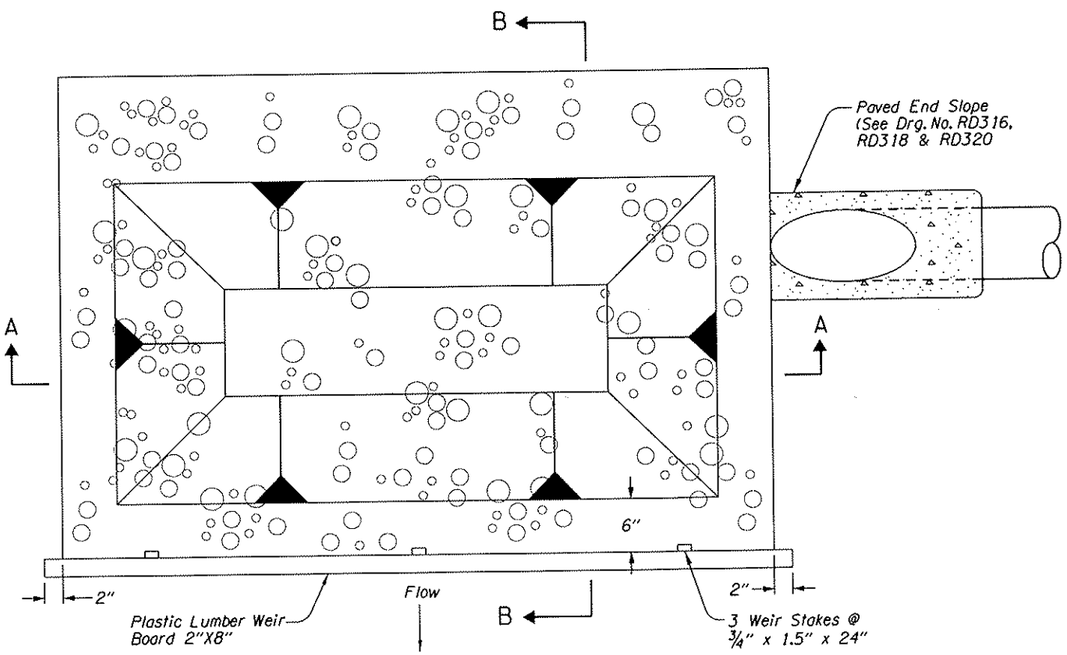
SWALE FLOW SPREADER
NTS

Flow Spreader Table

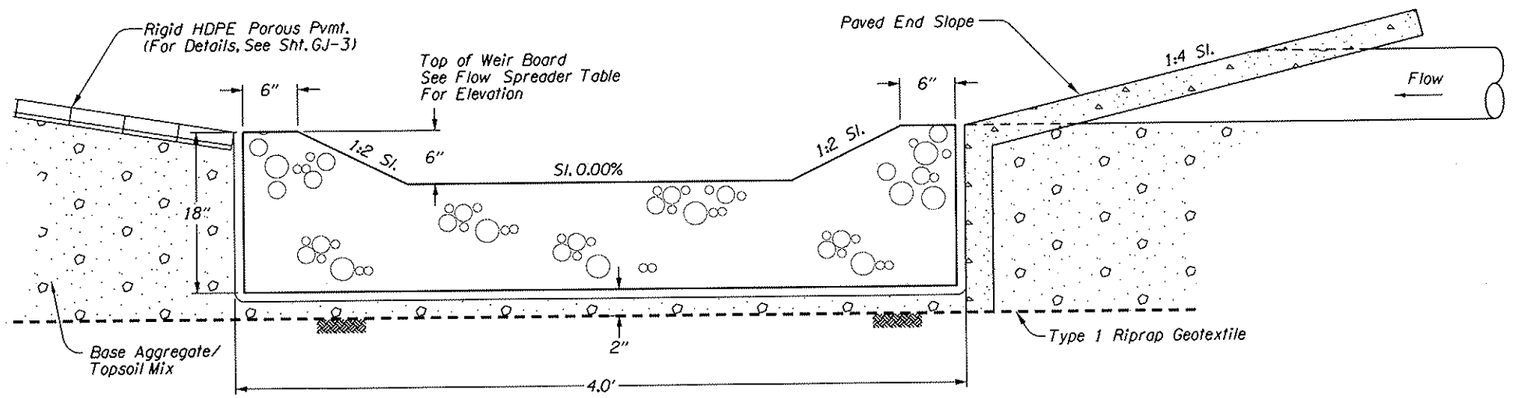
Station	Top Of Weir Board Elev.
"SW1" 1+00	293.67 ft.
"SW1" 2+00	290.87 ft.
"SW1" 3+00	288.07 ft.
"SW1" 3+28	287.28 ft.
"SW1" 4+50	283.87 ft.



SECTION B-B



PLAN



SECTION A-A

REGISTERED PROFESSIONAL ENGINEER
77658
ORIGINAL SIGNED BY
OREGON
JULY 11, 2006
JANET E. MASTERS

RENEWAL DATE: 12-31-2008

OREGON DEPARTMENT OF TRANSPORTATION

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PACIFIC HIGHWAY
MULTNOMAH, WASHINGTON & CLACKAMAS COUNTIES

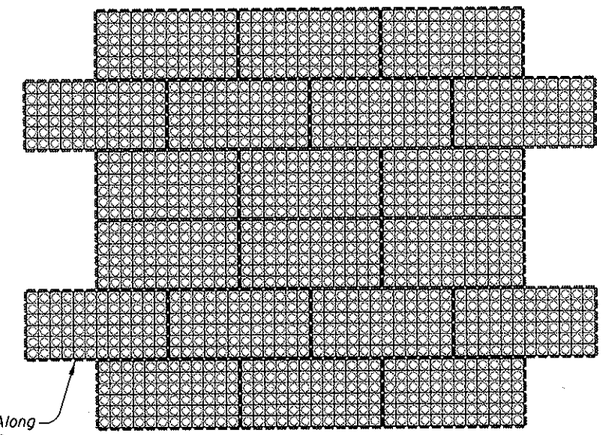
Reviewed By - Janet E. Masters
Designed By - Brendan V. O'Sullivan
Drafted By - Harry C. Marx

WATER QUALITY DETAILS

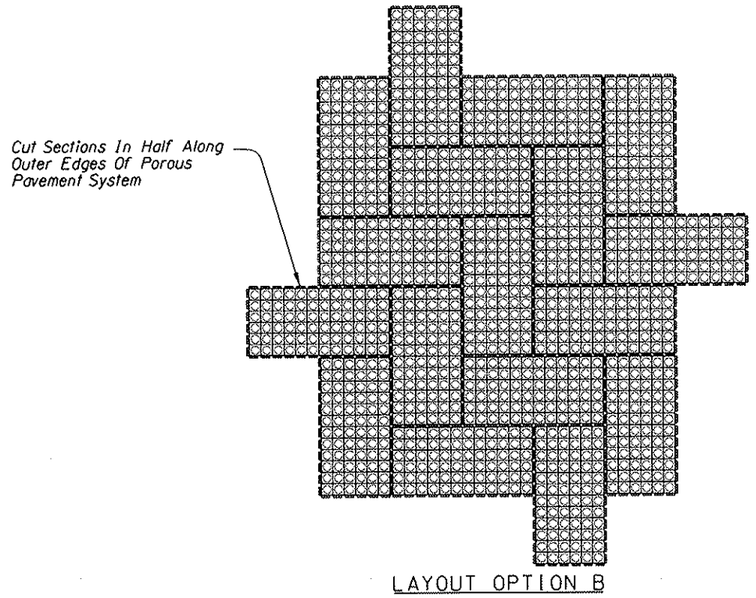
SHEET NO. GJ-2

RIGID HDPE POROUS PAVEMENT DETAILS

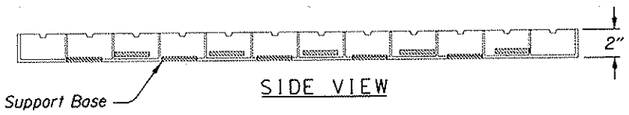
REVISED AS CONSTRUCTED
1/15/08 CONTRACT 13351



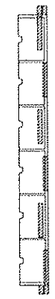
LAYOUT OPTION A



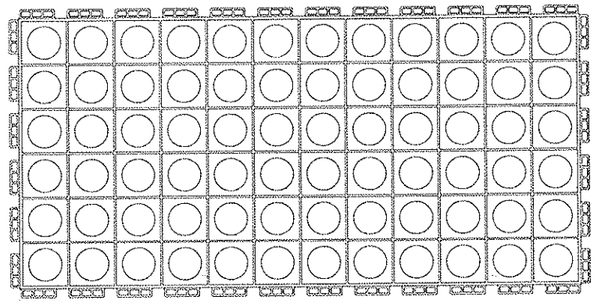
LAYOUT OPTION B



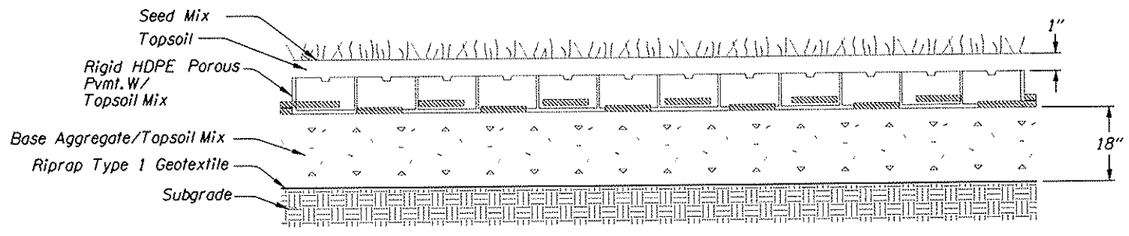
SIDE VIEW



END VIEW



TOP VIEW



TYPICAL CROSS SECTION

OREGON DEPARTMENT OF TRANSPORTATION

REGISTERED PROFESSIONAL ENGINEER
77658
ORIGINAL SIGNED BY
OREGON
JULY 11, 2006
JANET E. MASTERS

RENEWAL DATE: 12-31-2008

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PACIFIC HIGHWAY
MULTNOMAH, WASHINGTON & CLACKAMAS COUNTIES

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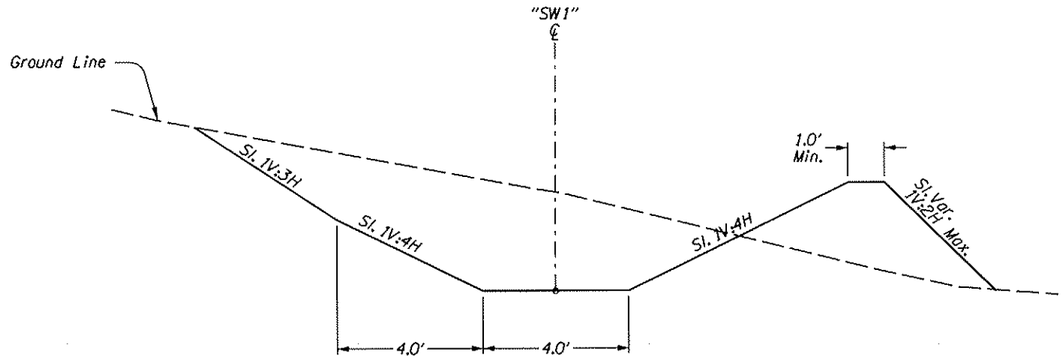
WATER QUALITY DETAILS

SHEET NO. GJ-3

REVISED AS CONSTRUCTED
1/15/08 CONTRACT 13351

WATER QUALITY SWALE TYPICAL SECTIONS

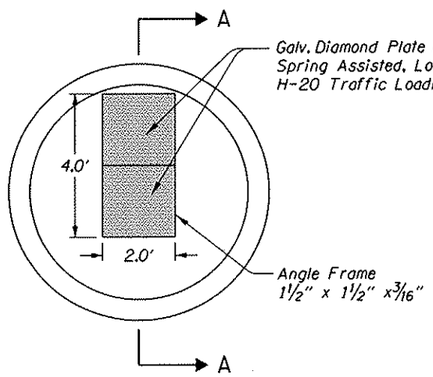


STA. "SW1" 1+00 To STA. "SW1" 5+00

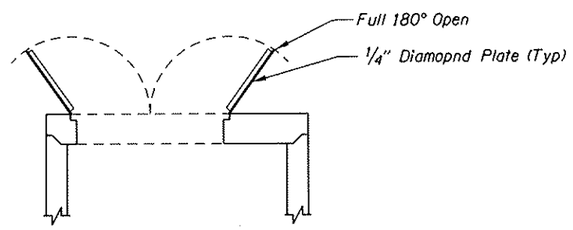
WATER QUALITY SWALE TYPICAL SECTION

72" MANHOLE COVER

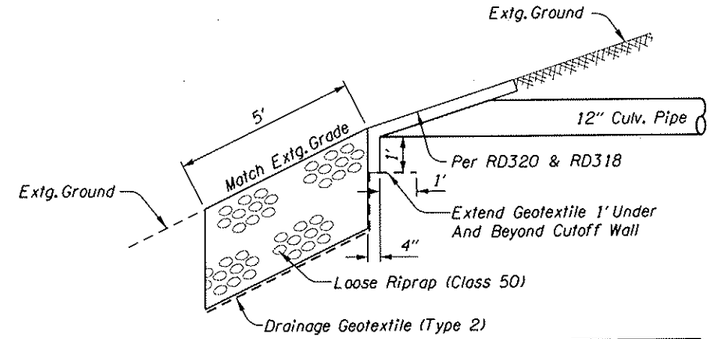
(For Details Not Shown, See Std. Drg. No. RD346)

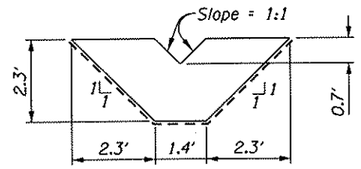


MANHOLE TOP SLAB PLAN

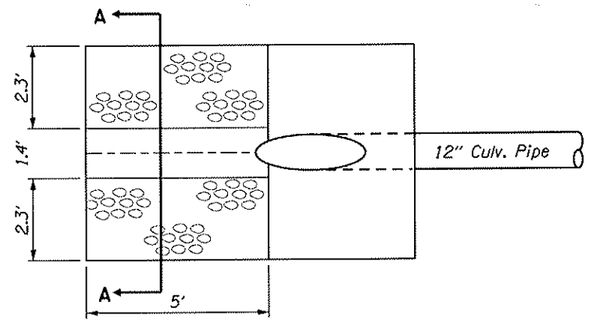


SECTION A-A





SECTION A-A



PLAN

OUTLET PROTECTION

Type 5

(For Details Not shown, See Drgs. No. RD318 & RD320)

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PACIFIC HIGHWAY
MULTNOMAH, WASHINGTON & CLACKAMAS COUNTIES

Reviewed By - Janet E. Masters
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Drafted By - Harry C. Marx

WATER QUALITY DETAILS

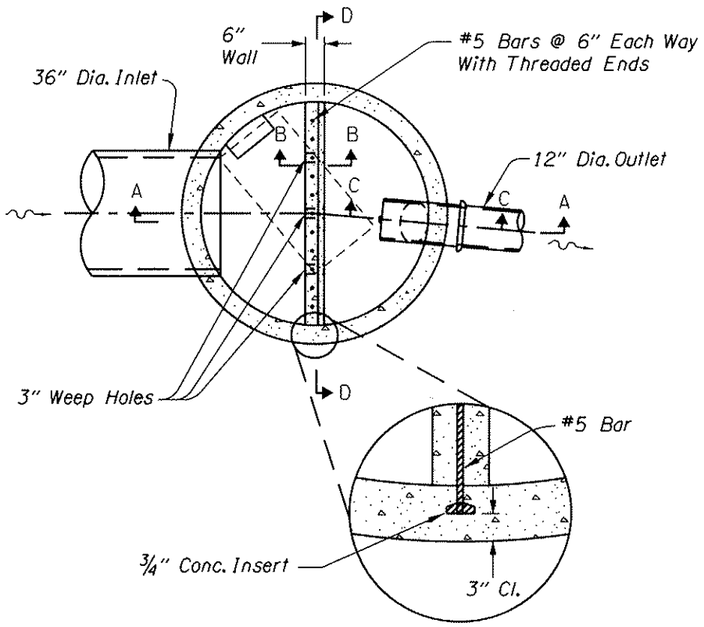
SHEET NO. GJ-4

72" MANHOLE @ STA. "L2" 1071+31

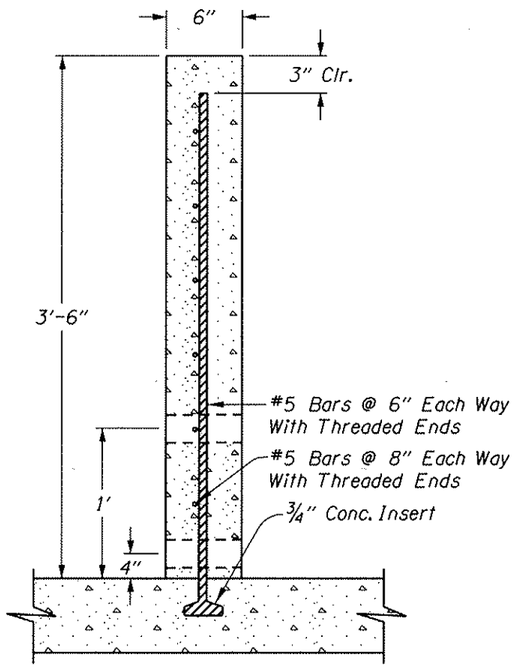
(For Details Not Shown, See Std. Drg. No. RD346)

NTS

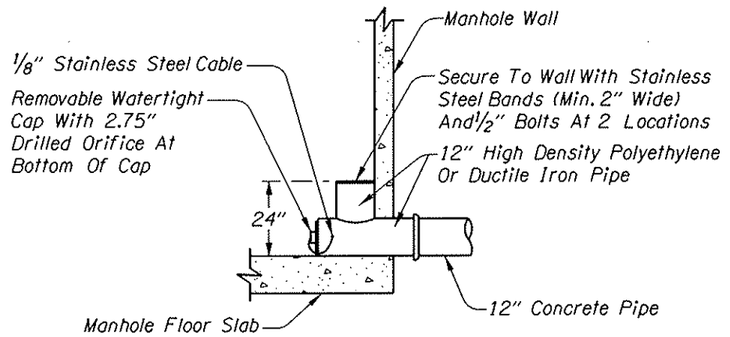
REVISED AS CONSTRUCTED
1/15/08 CONTRACT 13351



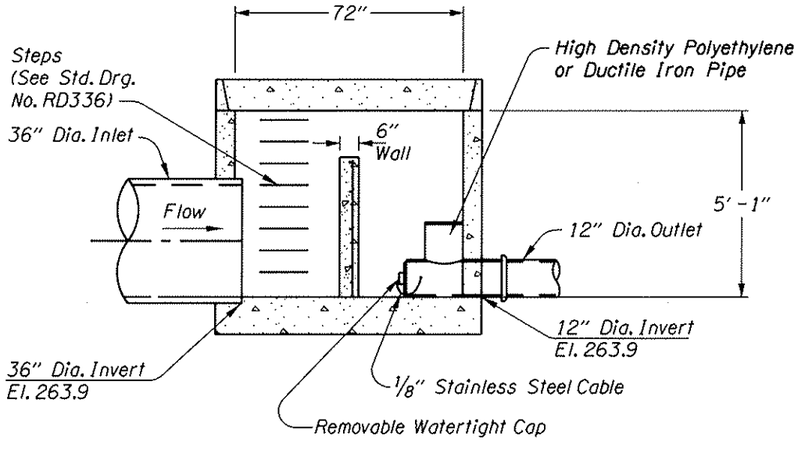
PLAN



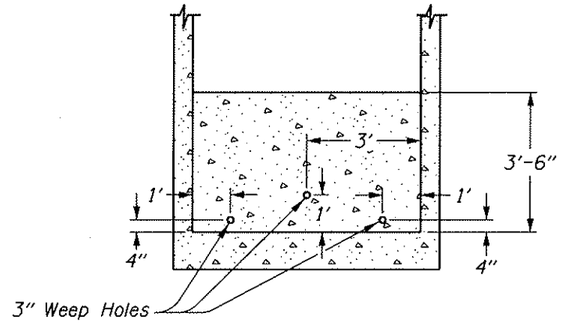
SECTION B-B



SECTION C-C



SECTION A-A



SECTION D-D

GENERAL NOTES:

All Bars Shall Be Placed 2" Clear Of The Nearest Face Of Concrete Unless Shown Otherwise.

Hardware, Fasteners And Anchors To Be Stainless Steel.

REGISTERED PROFESSIONAL ENGINEER
77658
ORIGINAL SIGNED BY
OREGON
JULY 11, 2006
JANET E. MASTERS

RENEWAL DATE: 12-31-2008

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

Reviewed By - Janet E. Masters
Designed By - Brendan V. O'Sullivan
Drafted By - Harry C. Marx

WATER QUALITY DETAILS

SHEET NO.
GJ-5

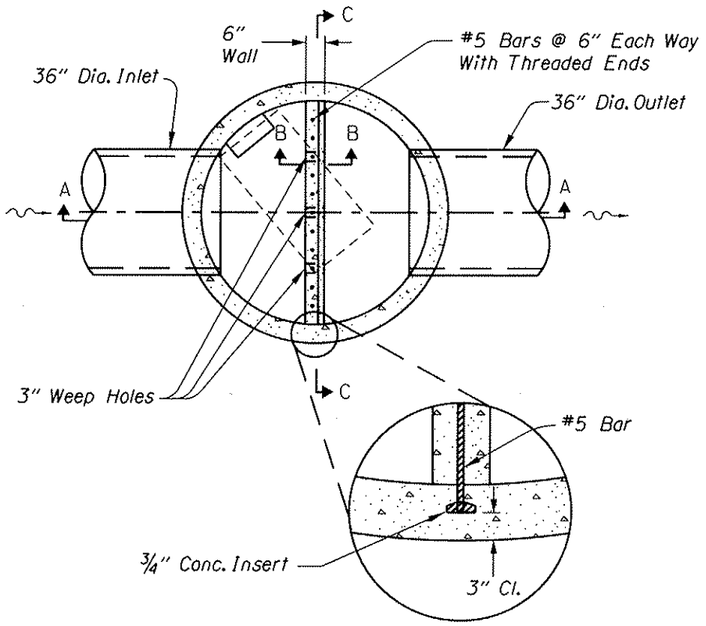
72" MANHOLE @ STA. "L2" 1069+34

(For Details Not Shown, See Std. Drg. No. RD346)

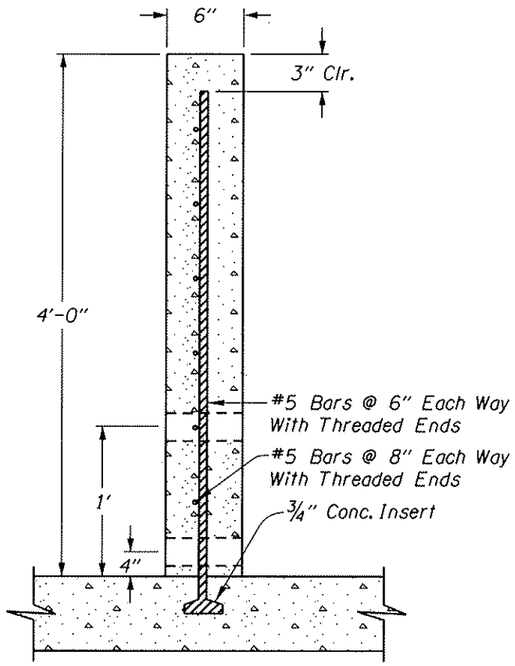
NTS

40V-55

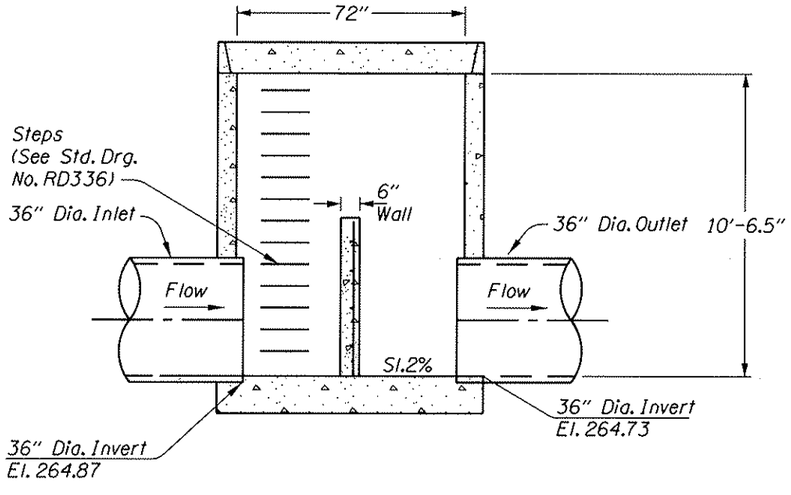
REVISED AS CONSTRUCTED
1/15/08 CONTRACT 13351



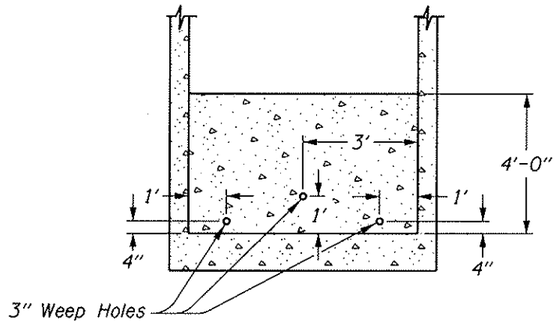
PLAN



SECTION B-B



SECTION A-A



SECTION C-C

GENERAL NOTES:

All Bars Shall Be Placed 2" Clear Of The Nearest Face Of Concrete Unless Shown Otherwise.

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77658
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RENEWAL DATE: 12-31-2008

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PACIFIC HIGHWAY
MULTNOMAH, WASHINGTON & CLACKAMAS COUNTIES

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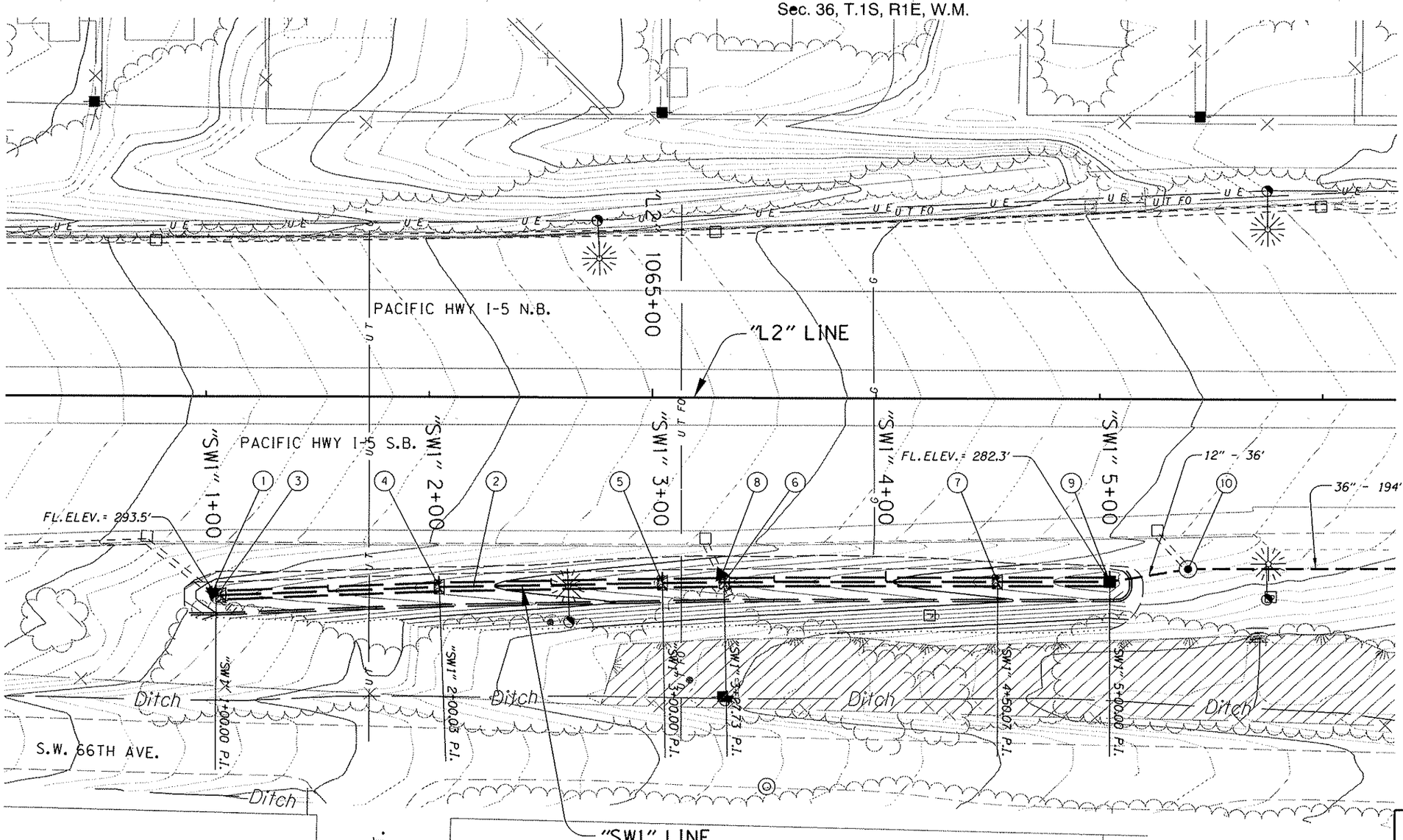
Designed By - Brendon V. O'Sullivan
Drafted By - Harry C. Marx

WATER QUALITY DETAILS

SHEET NO.
GJ-6

REVISED AS CONSTRUCTED
1/15/08 CONTRACT 13351

Sec. 36, T.1S, R1E, W.M.



1. *See Sht. 8A, Note 9*
   Remove Pipe
   Const. Paved End Slope
   (For Details, See Sht. GJ-2)
2. *Sta. "SW1" 1+00 To Sta. "SW1" 5+00*
   Const. Water Quality Swale - 400'
   Porous Pvmt. - 3200 Sq. Ft.
   Riprap, Type 1 Geotextile - 540 Sq. Yd.
   Base Aggregate - 160 Tons
   Exc. - 92 Cu. Yd.
   (For Details, See Shts. GJ, GJ-3, & GJ-4)
3. *Sta. "SW1" 1+00*
   Const. Swale Flow Spreader
   Riprap, Class 50 - 1 Cu. Yd.
   (For Details, See Sht. GJ-2)
4. *Sta. "SW1" 2+00*
   Const. Swale Flow Spreader
   Riprap, Class 50 - 1 Cu. Yd.
   (For Details, See Sht. GJ-2)
5. *Sta. "SW1" 3+00*
   Const. Swale Flow Spreader
   Riprap, Class 50 - 1 Cu. Yd.
   (For Details, See Sht. GJ-2)
6. *Sta. "SW1" 3+28*
   Const. Swale Flow Spreader
   Riprap, Class 50 - 1 Cu. Yd.
   (For Details, See Sht. GJ-2)
7. *Sta. "SW1" 4+50*
   Const. Swale Flow Spreader
   Riprap, Class 50 - 1 Cu. Yd.
   (For Details, See Sht. GJ-2)
8. *See Sht. 8A, Note 10*
   Const. Paved End Slope
   (For Details, See Sht. GJ-2)
9. *See Sht. 8A, Note 11*
   Const. Type "D" Inlet
10. *See Sht. 8A, Note 12*
    Const. Manhole 72" Dia.
    Inst. 36" Sew. Pipe

REGISTERED PROFESSIONAL ENGINEER
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OREGON
JULY 11, 2006
JANET E. MASTERS
RENEWAL DATE: 12-31-2008

OREGON DEPARTMENT OF TRANSPORTATION

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121 S.W. Salmon, Suite 900, Portland, Oregon 97204-2949
503.225.9010

MSA

I-5: CAPITOL HWY - TUALATIN RIVER SEC.

PACIFIC HIGHWAY
MULTNOMAH, WASHINGTON & CLACKAMAS COUNTIES

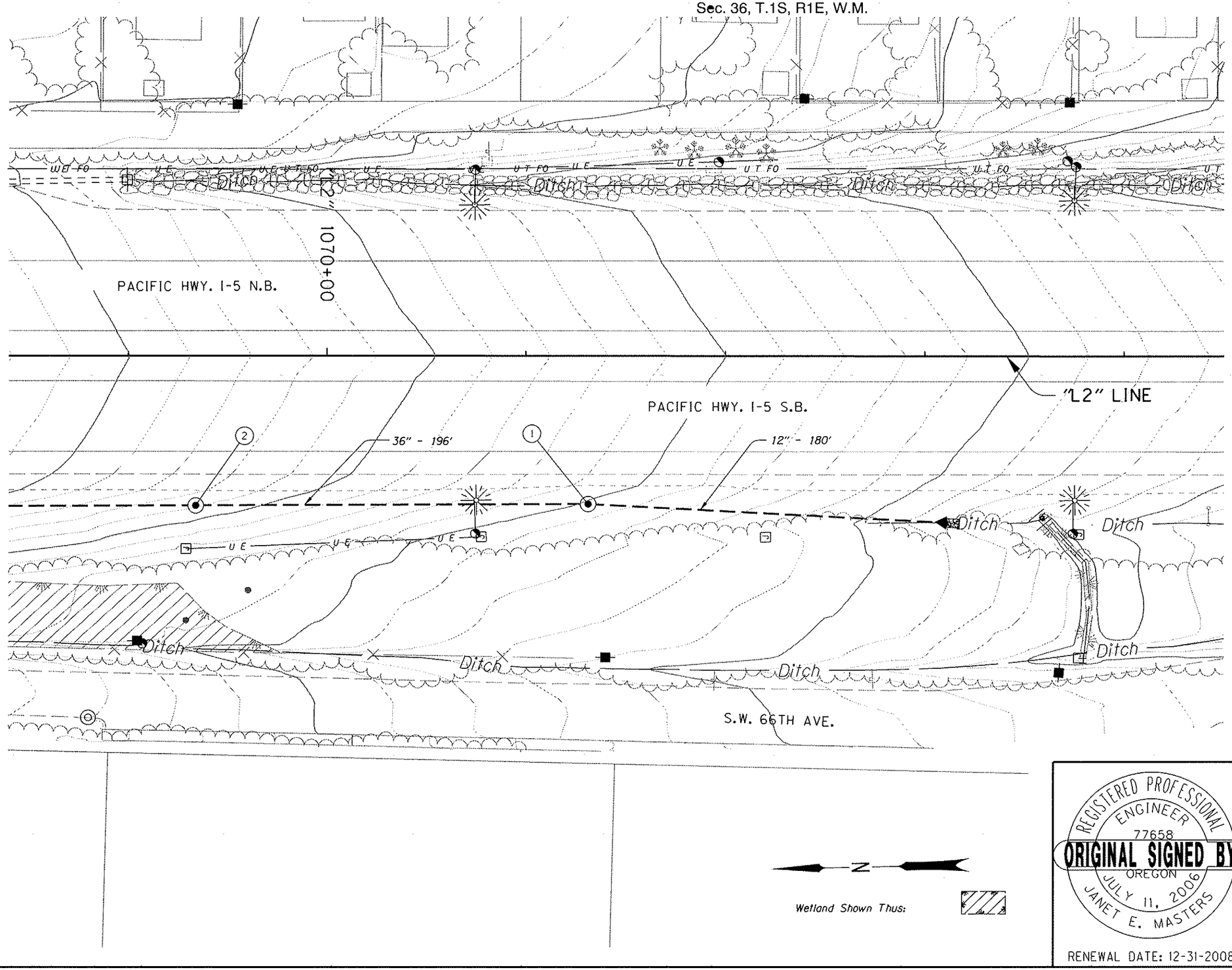
Reviewed By - Janet E. Masters
Designed By - Brendon V. O'Sullivan
Drafted By - Harry C. Marx

WATER QUALITY PLAN

SHEET NO. GJ-7

REVISED AS CONSTRUCTED
1/15/08 CONTRACT 13351

Sec. 36, T.1S, R1E, W.M.



(1) *See Sht. 8A, Note 8*
Const. Manhole 72" Dia.
Inst. 12" Sew. Pipe
Const. Paved End Slope
(For Details, See Shts. GJ-4 & GJ-5)

(2) *See Sht. 8A, Note 13*
Const. Manhole 72" Dia.
Inst. 36" Sew. Pipe
(For Details, See Shts. GJ-4 & GJ-6)

N

Wetland Shown Thus:

REGISTERED PROFESSIONAL ENGINEER
77658
ORIGINAL SIGNED BY
OREGON
JULY 11, 2006
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RENEWAL DATE: 12-31-2008

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Drafted By - Harry C. Marx

WATER QUALITY PLAN

SHEET NO. GJ-8

"SW1" LINE -PROFILE

(For Location, See Sht. GJ-7)

40V-55

REVISED AS CONSTRUCTED
1/15/08 CONTRACT 13351

300
295
290
285
280
275
270
265

293.50
SI. 1V:6H
+00 Extg. 12" Conc. Pipe
Swale Flow Spreader
+00.00
-2.8%
Extg. Ground @ Swale ℄
290.70
Swale Profile Grade @ ℄
Swale Flow Spreader
+00.00
-2.8%
287.90
Swale Flow Spreader
+00.00
287.11
+28 Extg. 12" Conc. Pipe
Swale Flow Spreader
+28.00
-2.8%
283.70
Swale Flow Spreader
+50.00
-2.8%
⑨
282.30
SI. 1V:6H
SI. 1V:6H
⑩
+00.00
12" - 36"
-5.0%
Extg. 12" Conc. Pipe
Exc. 92 C.Y.
Emb 460 C.Y.
See Sht. 8B-2
For Details

"SW1" 0+00 | "SW1" 1+00 | "SW1" 2+00 | "SW1" 3+00 | "SW1" 4+00 | "SW1" 5+00 | "SW1" 6+00

REGISTERED PROFESSIONAL ENGINEER
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WATER QUALITY PROFILE

SHEET NO. GJ-9