OPERATION & MAINTENANCE MANUAL

DFI No. : D00134
Facility Type: Detention Pond/Water Quality Biofiltration Swale Combo

JUNE, 2011

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1. Identification

Drainage Facility ID (DFI):	**D00134**
Facility Type:	Detention Pond/Water Quality Biofiltration Swale Combo
Construction Drawings:	(V-File Number) 39V-058
Location:	District: 2B (Old 2A)
	Highway No.: 064
	Mile Post: 2.41 – 2.51; (beg. / end)
	Description: This facility is located in the median of I-205 between Stafford Road and Prosperity Park Road. Access is obtained from the inside shoulders of either the northbound or southbound lanes.

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 - OBEC, Jerome D. Lane, P.E., 503-589-4100
Facility construction:	2006
Contractor:	Mainline Paving, LLC

4. Storm Drain System and Facility Overview

A detention pond/water quality biofiltration swale combo (referred to from this point forward as a pond/swale combo) combines the forms and functions of a water quality swale and a detention pond. In a pond/swale combo, the biofiltration swale is situated within the bottom confines of the detention facility. The facility provides water quality treatment of the smaller storm events and detention of the larger storm events.

The biofiltration swale is designed as if it was a separate facility and consists of a grassy-lined facility with a flat trapezoidal cross section and gradual slope. Treatment is provided through sedimentation and filtration processes. If amended soils are present, additional treatment is obtained through infiltration through the amended soil media.

When the flows exceed the water quality flows, the pond/swale combo facility begins to provide detention. Detention is required to reduce or mitigate the increases in discharge, resulting from development. The facility is designed to store and gradually release (or attenuate) stormwater runoff via a control structure or release mechanism, then releasing it slowly over a more extended period of time. The flow control mechanism for this facility involves a 4-inch orifice surrounded by a wirecloth strainer assembly. When flows exceed the water quality design flow, the orifice restricts the flow causing the water to backup within the facility.

This particular detention pond/water quality biofiltration swale combo facility (Photos 2 & 3) is approximately 500-feet long and is located in the median of I-205 (Hwy 64). Access is obtained from the inside shoulders of either the northbound or southbound lanes.

The system is feed stormwater as sheet flow from the northbound and southbound lanes of I-205 (Hwy 64). Water travels through the swale from both the east and west sides and exits through the swale outlet structure (Point A, Operational Plan, Appendix A, Photo 4). The water travels through an 18-inch pipe northward into the near stormwater system.

A. Maintenance equipment access:
   Access is obtained from the inside shoulders of the north and southbound lanes of I-205 (Hwy 64); see Photo 1.

B. Heavy equipment access into facility:

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

C. Special Features:

☐ Amended Soils
☐ Porous Pavers
☐ Liners
☐ Underdrains

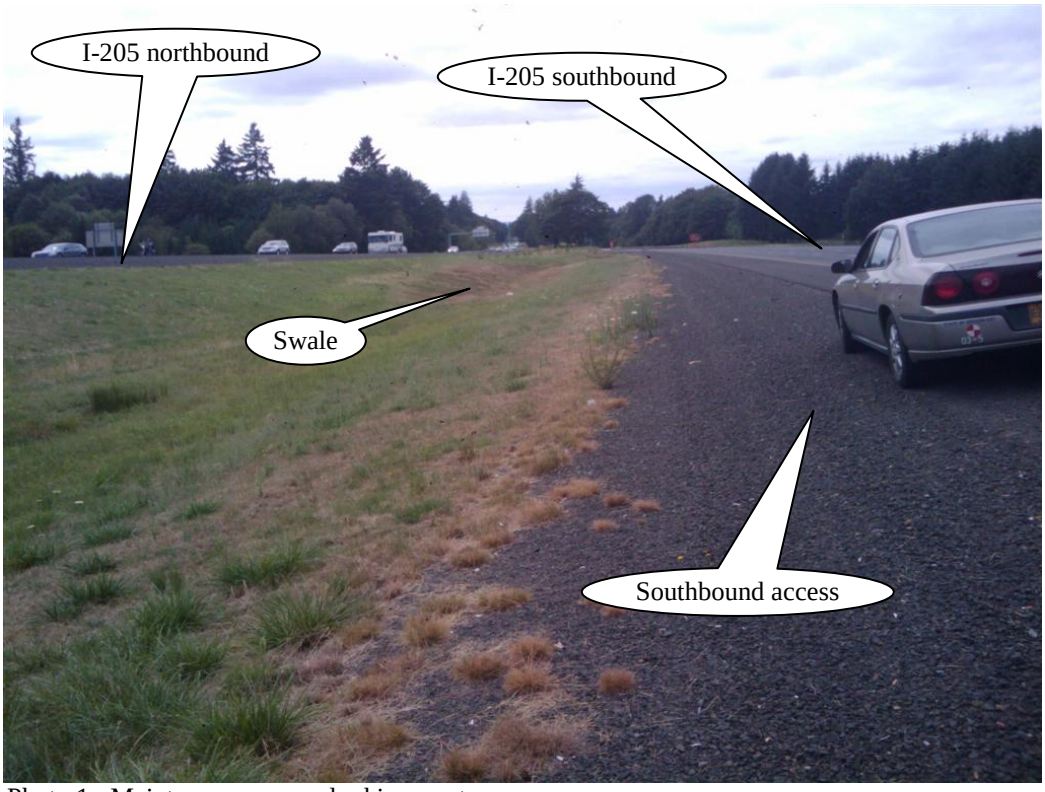


Photo 1: Maintenance access looking west

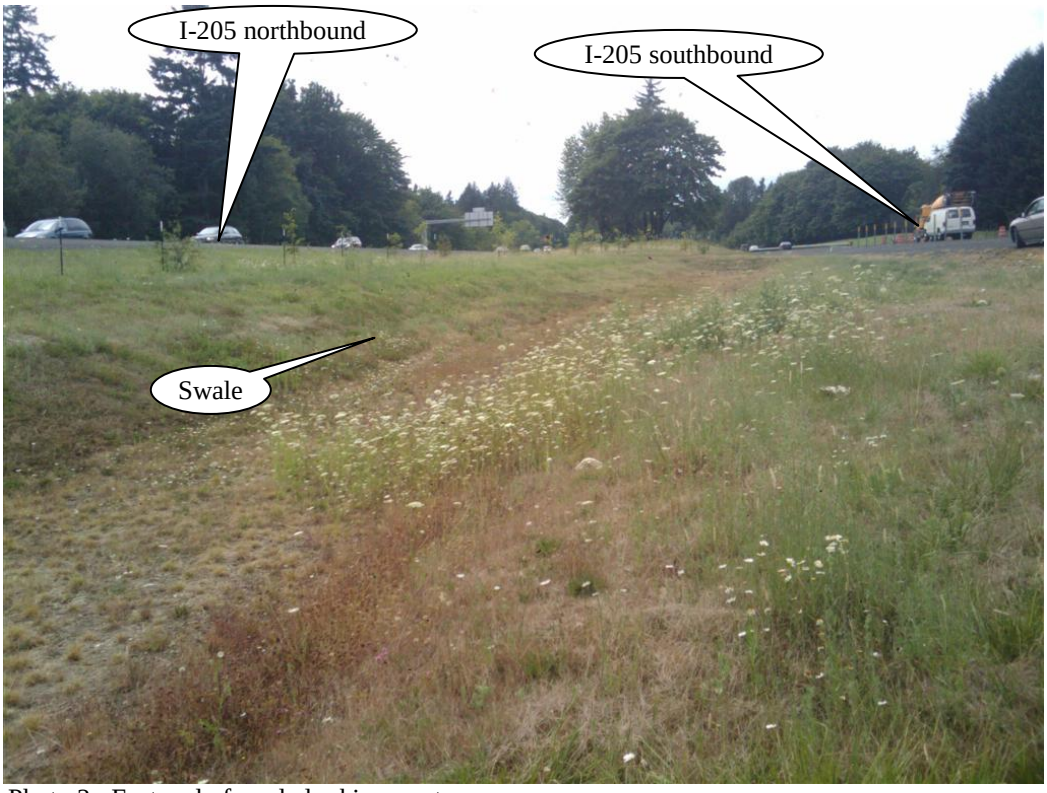


Photo 2: East end of swale looking west

Photo 3: Swale looking west

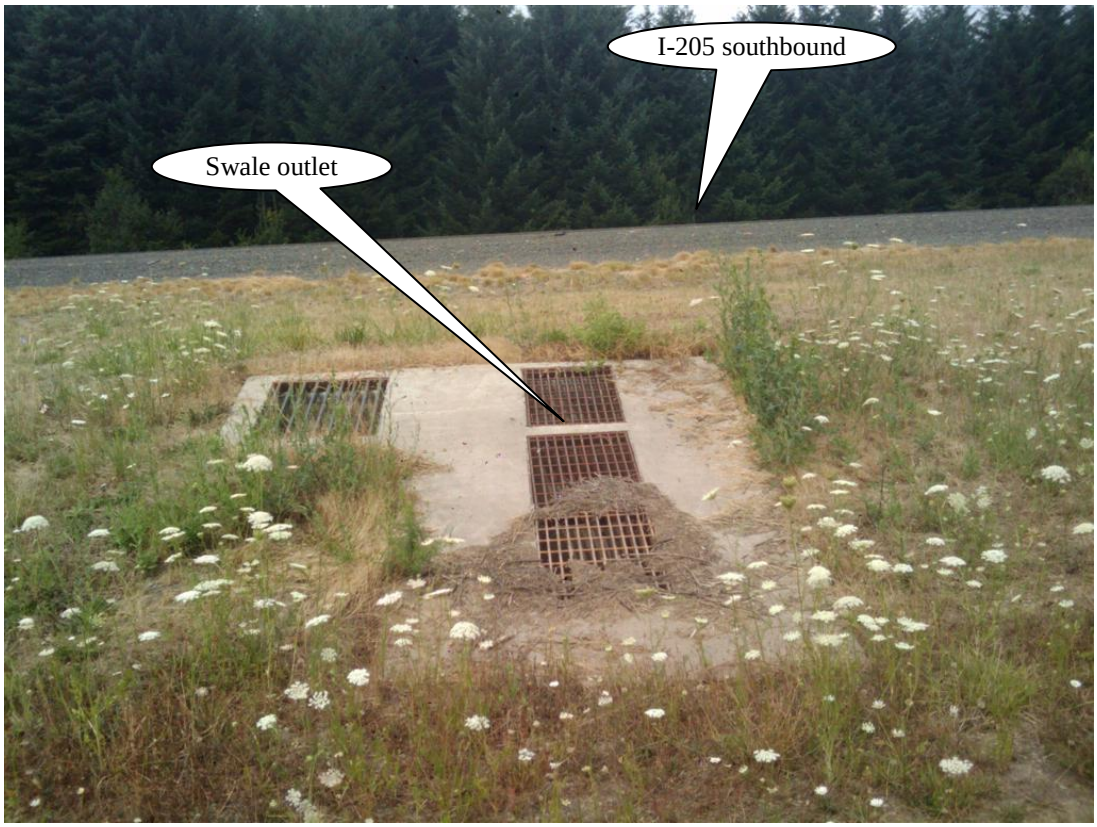


Photo 4: Outlet structure looking north

5. Facility Haz Mat Spill Feature(s)

The detention pond/water quality biofiltration swale combo can be used to store a volume of liquid by blocking the 18-diameter outlet pipe located at the outlet structure (Point A, Photo 4).

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
The auxiliary outlet is located in the outlet structure (Point A, Photo 4). In the case of high flows water will spill over the first two outlets and exit out of the top two inlets (located side by side). The two top inlets are connected to each other by an 18-inch pipe. Water then flows out of the

system through an 18-inch storm pipe toward a nearby stormwater system.

☐ 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

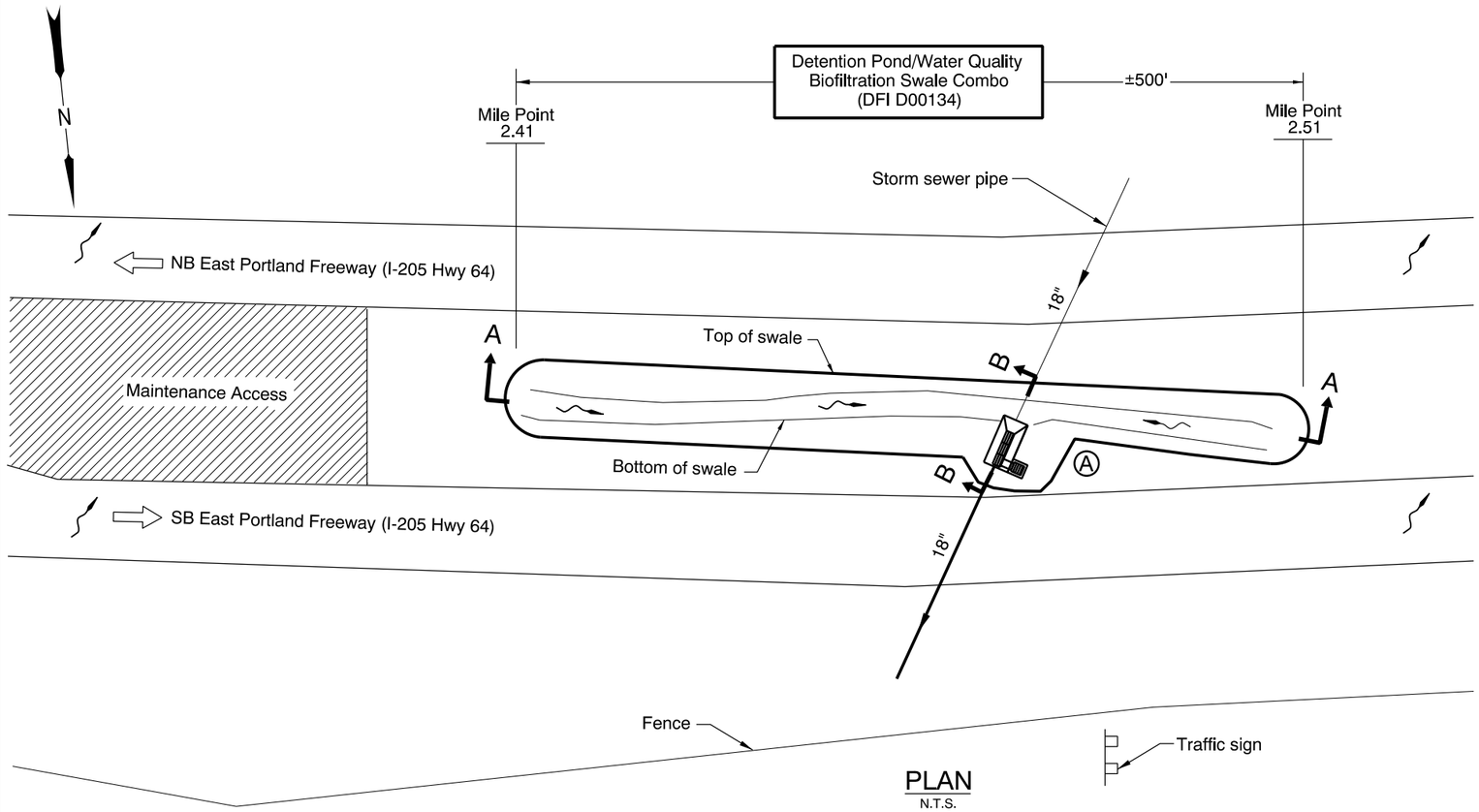
Contact any of the following for more detailed information about management of waste materials found on site:

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

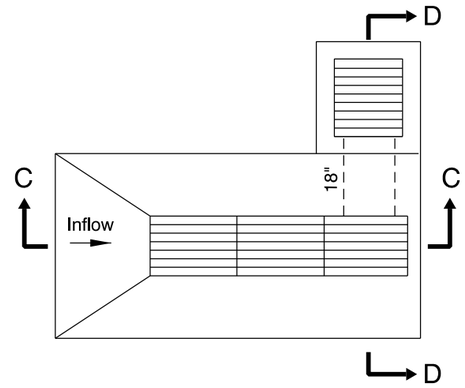
Appendix A

Content:

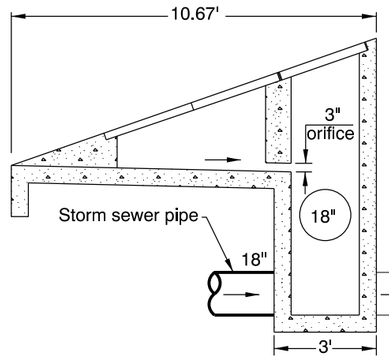
- **Operational Plan and Profile Drawing(s)**



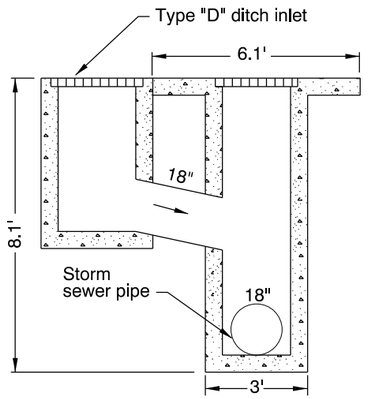
PLAN
N.T.S.



PLAN

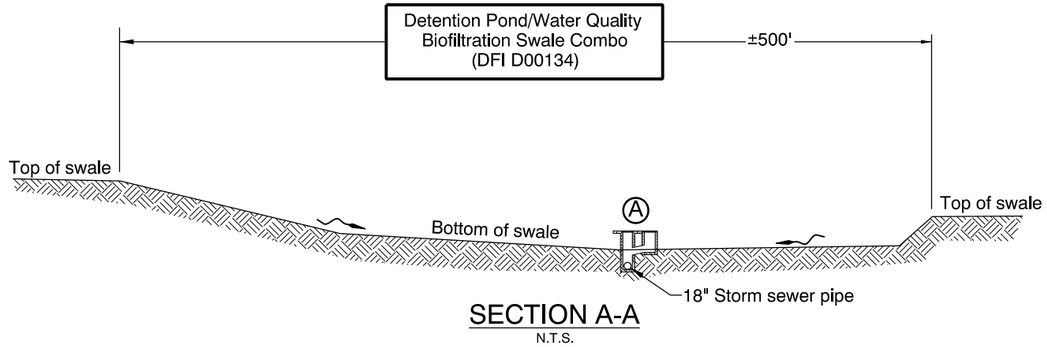


SECTION C-C

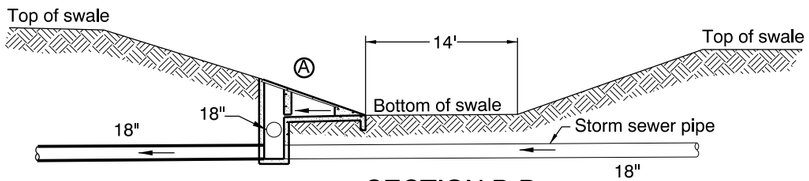


SECTION D-D

SWALE OUTLET STRUCTURE DETAILS AT POINT Ⓐ
N.T.S.



SECTION A-A
N.T.S.



SECTION B-B
N.T.S.

LEGEND:

- Photo Location / Direction
- Swale Outlet Structure
- Traffic Flow / Direction
- Storm Pipe (Facility)
- Storm Pipe
- Conveyance Direction
- Pavement / Facility Flow Path
- Maintenance Access

Sht. 1 of 1

OREGON DEPARTMENT OF TRANSPORTATION

Prepared By: Craig Fox

Drafted By: Rodney Schultz

DFI D00134
MAINTENANCE DISTRICT 2B HWY 64
DETENTION POND/WQ SWALE COMBO
EAST PORTLAND FREEWAY MP 2.41-2.51
CLACKAMAS COUNTY

Appendix B

Content:

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

39V-58

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

STATE OF OREGON

DEPARTMENT OF TRANSPORTATION

PLANS FOR PROPOSED PROJECT

GRADING, DRAINAGE, STRUCTURES, PAVING, SIGNING & ILLUMINATION

I-205: WILLAMETTE RIVER BR. - PACIFIC HWY. (UNIT 3) SEC.

EAST PORTLAND FREEWAY

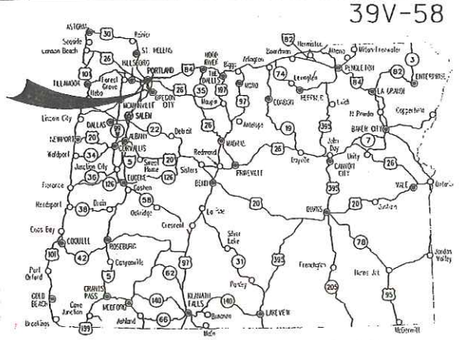
CLACKAMAS & WASHINGTON COUNTIES

APRIL 2006

"AS CONSTRUCTED"

Mark Beeson

Date 6/26/09 Project Mngr



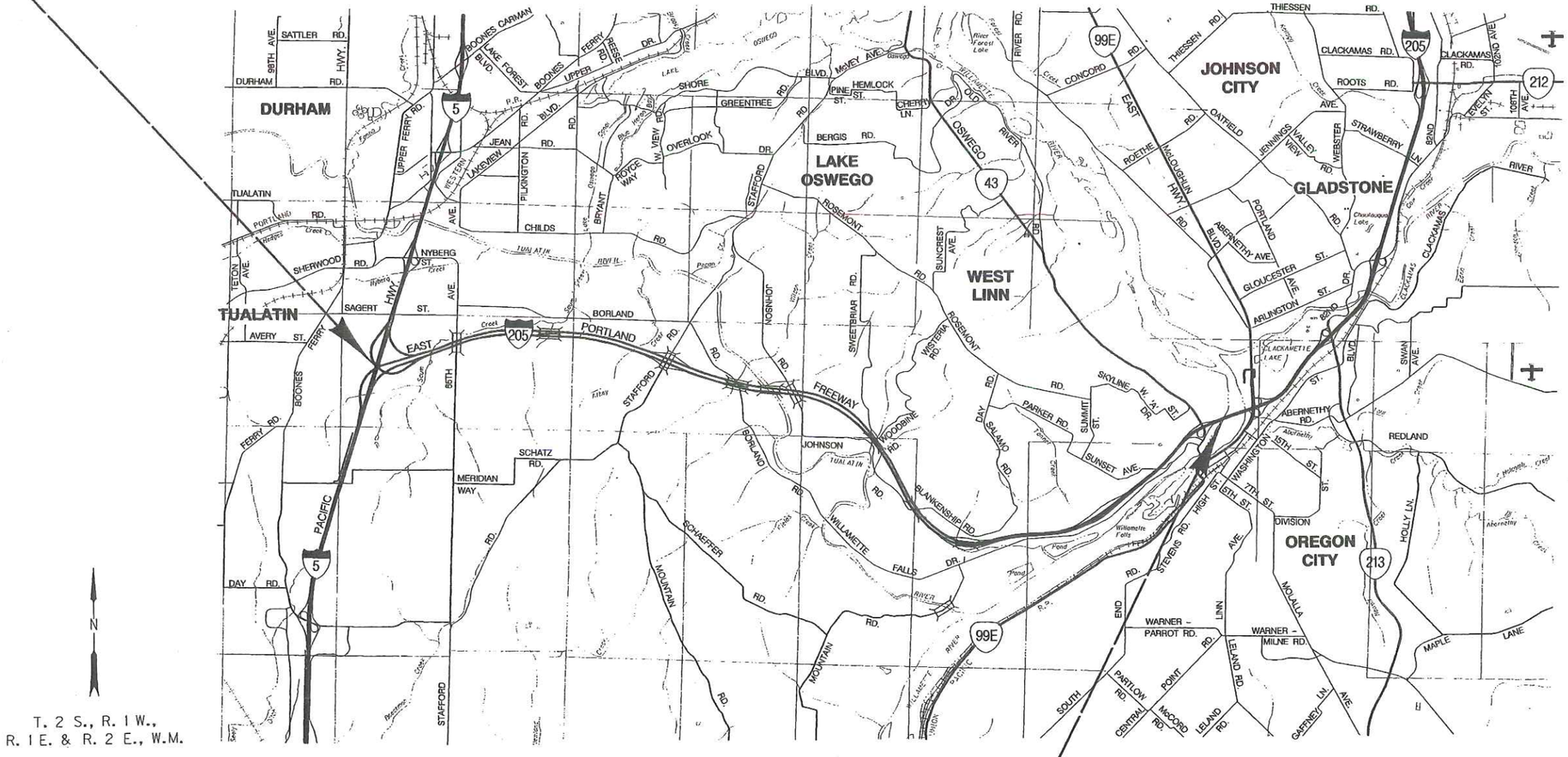
Overall Length Of Project - 8.90 Miles

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

END OF PROJECT IM-OTIA-S064(032)

STA. "LS2" 1231+71.15 (M.P. -0.10)



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

BEGINNING OF PROJECT IM-OTIA-S064(032)

STA. "L" 735+41.85 (M.P. 8.80)

OREGON TRANSPORTATION COMMISSION

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

REGISTERED PROFESSIONAL ENGINEER
14,953
OREGON
JULY 25, 1990
LAWRENCE H. FOX

EXPIRES: 12/31/07

LAWRENCE H. FOX
OBEC CONSULTING ENGINEERS - PROJECT MANAGER

OREGON DEPARTMENT OF TRANSPORTATION
CONCURRENCE

Harold E. Lasley 2/23/06
TECHNICAL SERVICES MANAGING ENGINEER DATE

I-205: WILLAMETTE RIVER BR. - PACIFIC HWY. (UNIT 3) SEC.
EAST PORTLAND FREEWAY
CLACKAMAS & WASHINGTON COUNTIES

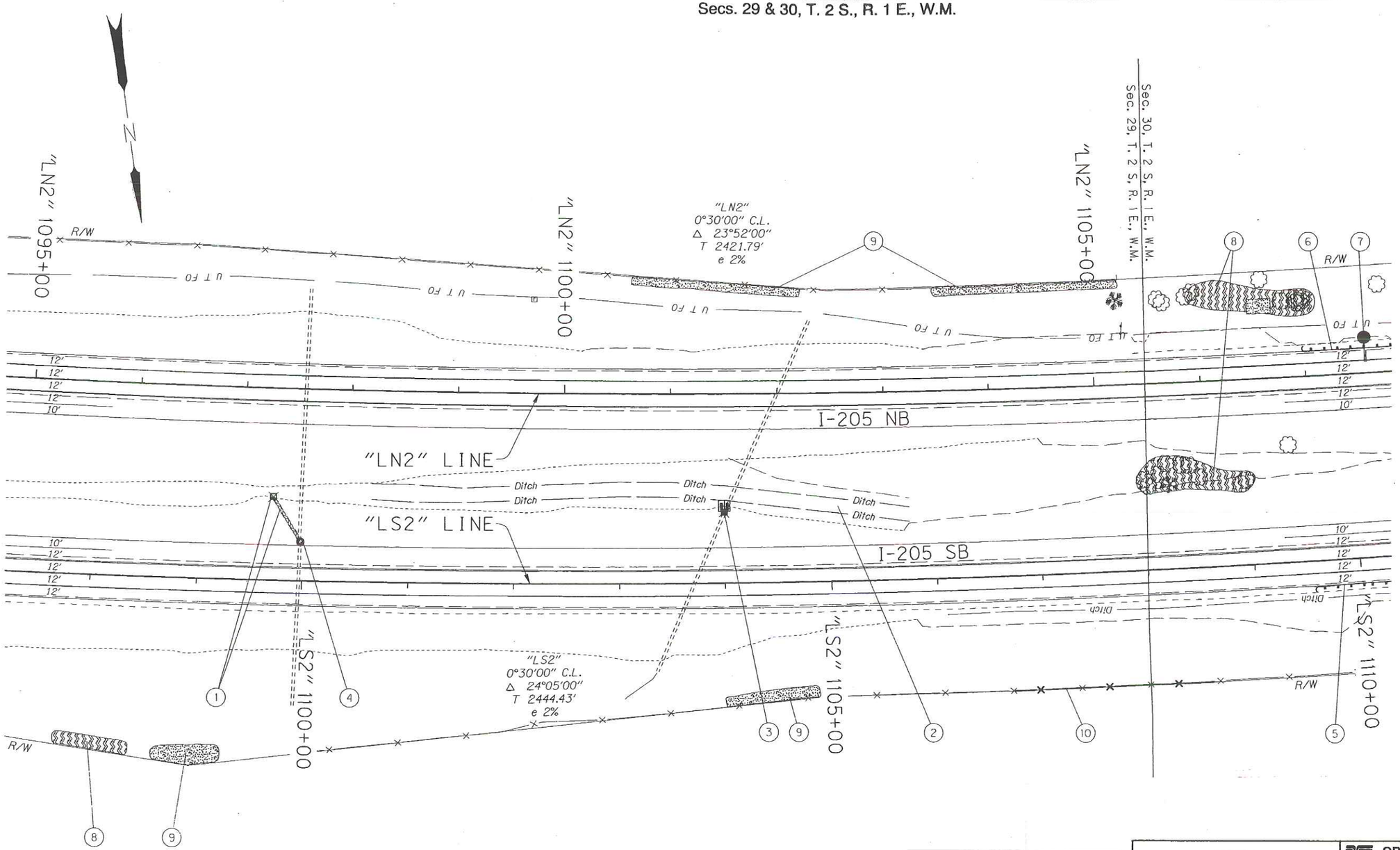
FEDERAL HIGHWAY ADMINISTRATION	PROJECT NUMBER	SHEET NO.
OREGON DIVISION	IM-OTIA-S064(032)	1

File No. 15980

i:\Projects\019\019082\Roadway\12874fs.fs1 2/14/06

Secs. 29 & 30, T. 2 S., R. 1 E., W.M.

39V-58



1. Sta. "LS2" 1099+68.2, 84.9' Lt.
   Remove Inlet
   Remove Sew. Pipe - 48'
2. Const. Bio-Swale/Detention Pond 2
   Ditch Exc. - 1135 Cu.Yd.
   △1 (For Details, See Sht. GJ-3)
3. Sta. "LS2" 1104+03.8, 76.3' Lt.
   Remove Inlet
   Const. Outlet Structure
   Over Sew. Pipe
   (See Drg. No. RD368)
   (For Details, See Sht. GJ-3B)
4. Sta. "LS2" 1099+97.6, 34' Lt.
   Cap Inlet
   (See Drg. No. RD376)
5. Const. Guardrail - 775' (Type 2A)
   Const. Guardrail Terminal, Non-Flared (50')
   Flare Rate=0, W=1', E=0
6. Const. Guardrail - 900' (Type 2A)
   Const. Anchor (Type 1 Mod.)
   Inst. End Piece (Type B)
7. Sta. "LN2" 1107+50
   Const. Cantilever Sign & Foundation
   (For Drg. Nos., See Sht. 1A)
8. Type "A" Weed Control
9. Type "B" Weed Control
10. Sta. "LS2" 1106+69 To
    Sta. "LS2" 1108+55, Rt.
    Remove Type 2 Fence - 190'
    Const. Type 2 Fence - 190'

REVISIONS	
△1	Revised 04-10-2006 Revised Note

"AS CONSTRUCTED"
Mark Bacon
Date 6/26/09 | Project Mngr

LEGEND

Remove Extg. Pipe Shown Thus: ----------

Type "A" Weed Control Shown Thus: ////

Type "B" Weed Control Shown Thus: ▒▒▒

REGISTERED PROFESSIONAL ENGINEER
12295
Jerome D. Lane
OREGON
JULY 5, 1983
JEROME D. LANE
EXPIRES: 12/31/06

OBEC CONSULTING ENGINEERS
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Corporate Office: 920 COUNTRY CLUB ROAD, SUITE 100B EUGENE, OREGON 97401-8089
2235 MISSION STREET SE, SUITE 100 SALEM, OREGON 97302-1286
1335 POPLAR DRIVE MEDFORD, OREGON 97504-5207

OREGON DEPARTMENT OF TRANSPORTATION
ROADWAY ENGINEERING SECTION

I-205: WILLAMETTE RIVER BR. - PACIFIC HWY. (UNIT 3) SEC.
EAST PORTLAND FREEWAY
CLACKAMAS & WASHINGTON COUNTIES

Design Team Leader - Jerry Lane
Designed By - Tom Metcalf
Drafted By - Serban Dinca

ALIGNMENT AND GENERAL CONSTRUCTION

SHEET NO. 31

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39V-58

"LN2" LINE

230
220
210
200

-2.37%
24"
Subgrade
Profile Grade @ ℄
Extg. Ground @ ℄
207.17
1485' V.C.
+10.50
24"
Subgrade
Exc. 700 C.Y.
Emb. 6570 C.Y.
1095+00
1100+00
1105+00

"LS2" LINE

220
210
200
190

22"
Subgrade
Profile Grade @ ℄
-1.69%
Extg. Ground @ ℄
Const. Outlet Structure
(For Details, See Sht. GJ-3B)
22"
Subgrade
Exc. 1480 C.Y.
Emb. 4880 C.Y.
1100+00
1105+00
1110+00

"AS CONSTRUCTED"
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Date 6/26/09 | Project Mngr

REVISIONS	
1	Revised 04-10-2006 Revised Quantity

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OREGON DEPARTMENT OF TRANSPORTATION
ROADWAY ENGINEERING SECTION

I-205: WILLAMETTE RIVER BR. - PACIFIC HWY. (UNIT 3) SEC.
EAST PORTLAND FREEWAY
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Design Team Leader - Jerry Lane
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PROFILES

SHEET NO. 31A

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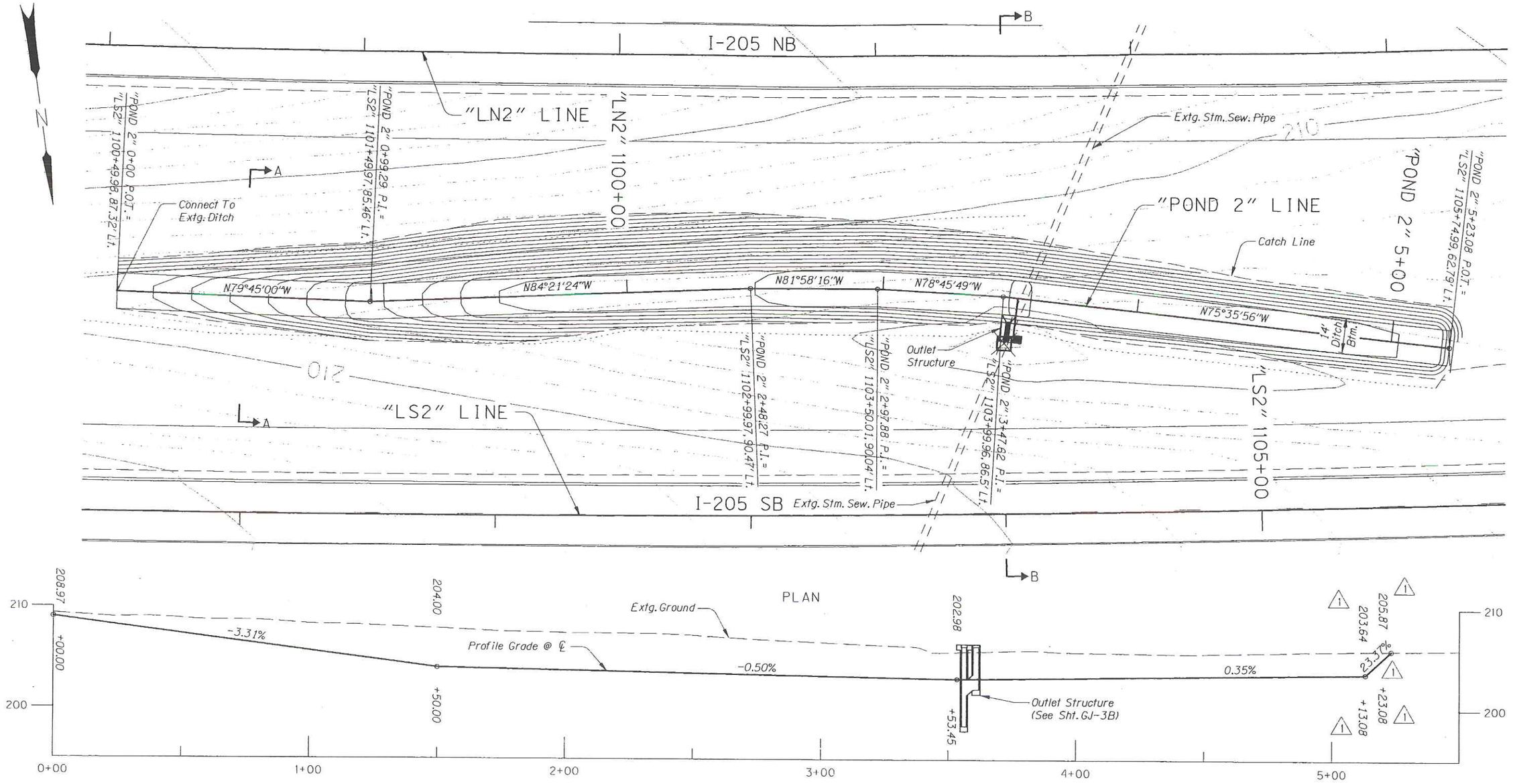

PROFILE
(See Sht. 31, Notes 2 & 3)

"AS CONSTRUCTED"
Mark Bern
Date 6/26/09 | Project Mngr

NOTE:
For Sections Not Shown, See Sht. GJ-3A.
For Outlet Structure Details, See Sht. GJ-3B.

REVISIONS	
1	Revised 04-10-2006 Revised Profile

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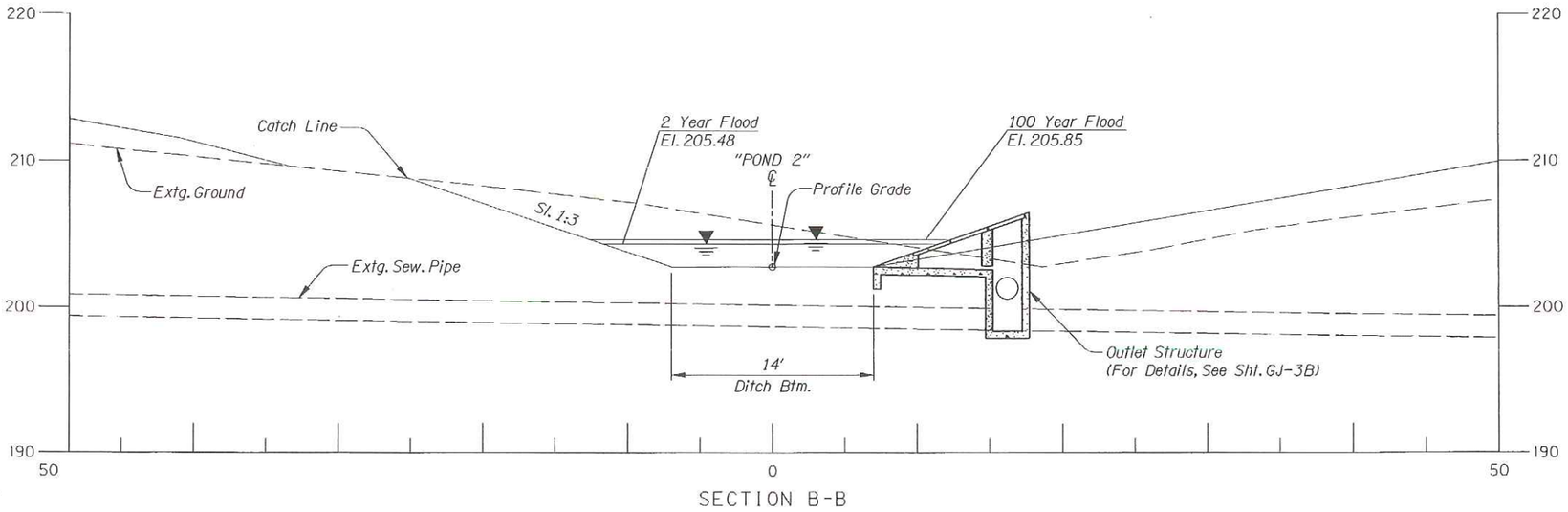
ROADWAY ENGINEERING SECTION

I-205: WILLAMETTE RIVER BR. - PACIFIC HWY. (UNIT 3) SEC.
EAST PORTLAND FREEWAY
CLACKAMAS & WASHINGTON COUNTIES

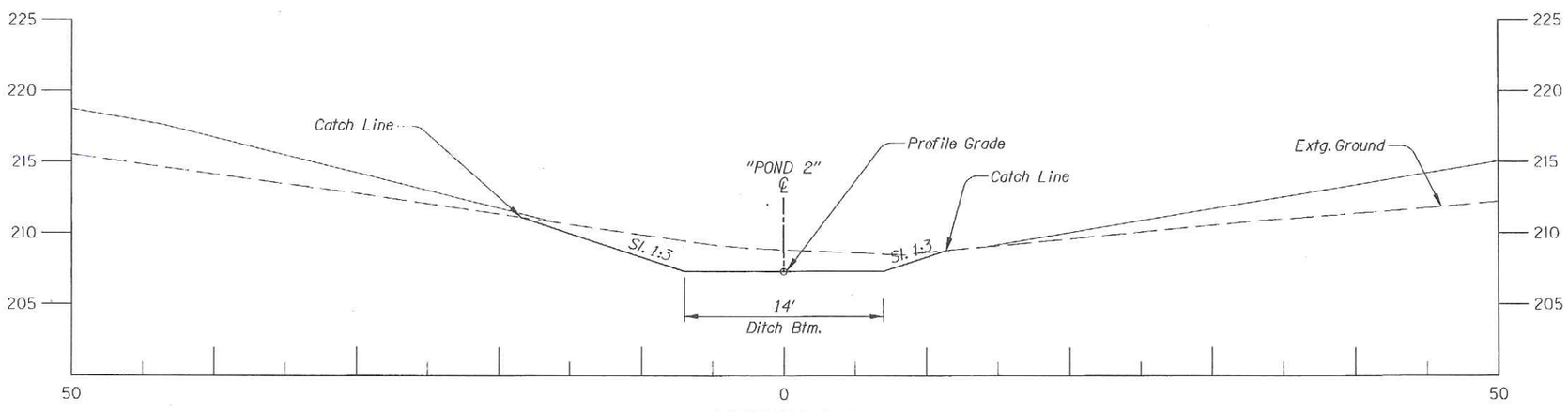
Design Team Leader - Jerry Lane
Designed By - James Kent
Drafted By - Mathew Bunde

POND 2
PLAN AND PROFILE

SHEET NO. GJ-3



SECTION B-B



SECTION A-A

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Date 6/26/09 | Project Mngr

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JULY 5, 1983
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OREGON DEPARTMENT OF TRANSPORTATION
ROADWAY ENGINEERING SECTION

I-205: WILLAMETTE RIVER BR. -
PACIFIC HWY. (UNIT 3) SEC.
EAST PORTLAND FREEWAY
CLACKAMAS & WASHINGTON COUNTIES

Design Team Leader - Jerry Lane
Designed By - James Kent
Drafted By - Mathew Bunde

POND 2
CROSS SECTIONS

SHEET NO. GJ-3A

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2/7/2006

File No. 16299

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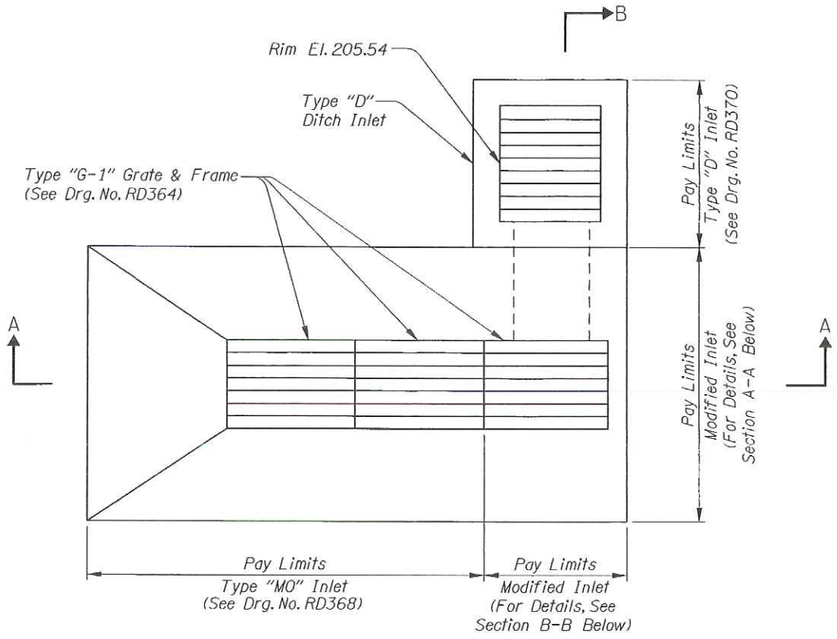
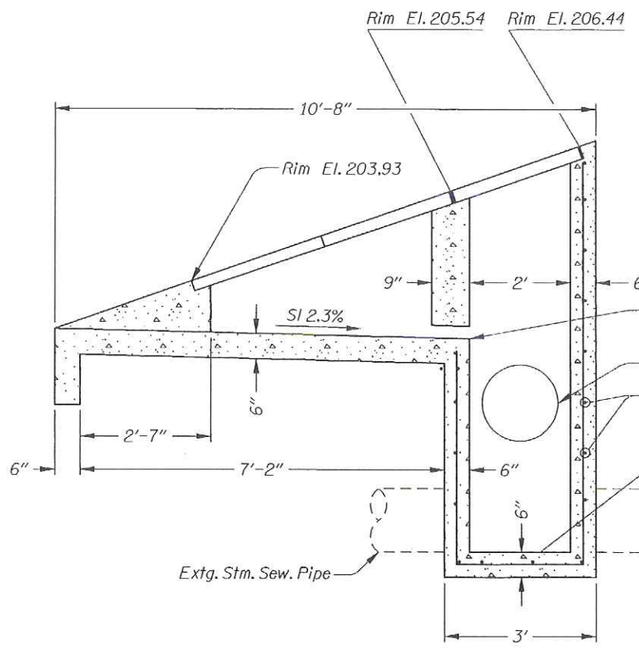


PLAN



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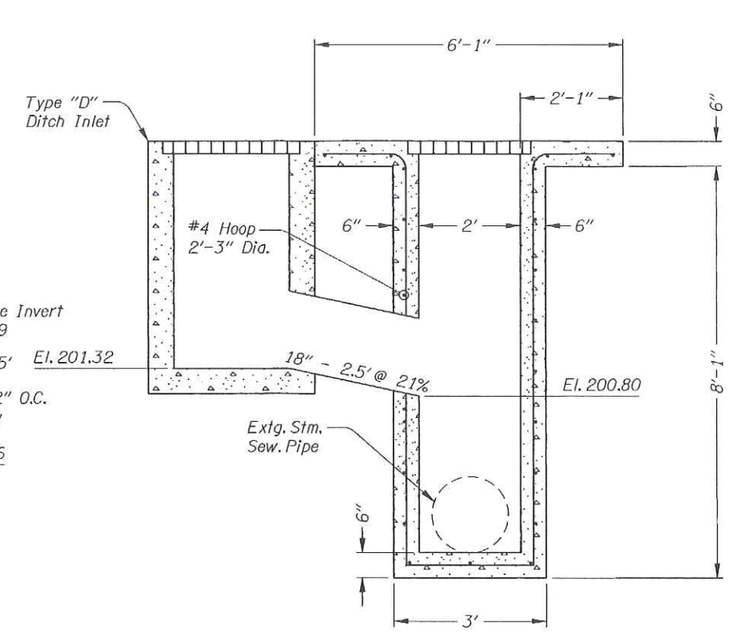

SECTION B-B

OUTLET STRUCTURE

GENERAL NOTES:

All Material And Workmanship Shall Conform To The 2002 Oregon Standard Specifications For Construction.

All Reinforcement Steel Shall Conform To Astm Specification A615, Grade 60 Or A706.

The Following Splice Lengths Shall Be Used.

Bar Size		3	4	5	6	7	8	9	10	11
Splice Length	Uncoated	1'-0"	1'-4"	1'-8"	2'-0"	2'-8"	3'-6"	4'-4"	5'-7"	6'-9"
	Epoxy Coated	1'-5"	1'-10"	2'-4"	2'-10"	3'-9"	4'-11"	6'-1"	7'-10"	9'-6"

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

Concrete Shall Be Commercial Grade Concrete ODOT Section 00440.

"AS CONSTRUCTED"
Mark Bean
Date 6/26/09 Project Mngr

REGISTERED PROFESSIONAL ENGINEER
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JULY 5, 1983
JEROME D. LANE
EXPIRES: 12/31/06

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1335 POPLAR DRIVE MEDFORD, OREGON 97504-5207

OREGON DEPARTMENT OF TRANSPORTATION
ROADWAY ENGINEERING SECTION

I-205: WILLAMETTE RIVER BR. - PACIFIC HWY. (UNIT 3) SEC.
EAST PORTLAND FREEWAY
CLACKAMAS & WASHINGTON COUNTIES

Design Team Leader - Jerry Lane
Designed By - James Kent
Drafted By - Mathew Bunde

POND 2
DETAILS

SHEET NO.
GJ-3B