

OPERATION & MAINTENANCE MANUAL

DFI No. : D00132

**Facility Type: Detention Pond/Water
Quality Biofiltration Swale Combo**



JUNE, 2011

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1. Identification

Drainage Facility ID (DFI): **D00132**

Facility Type: Detention Pond/Water Quality Biofiltration Swale Combo

Construction Drawings: (V-File Number) 39V-085

Location: District: 2B (Old 2A)
Highway No.: 64
Mile Post: 4.95 – 5.04 (beg./end)

Description: This facility is located in the median of I-205 (Hwy 64) approximately one mile west of the 10th Street Interchange near West Linn, Oregon. Access is obtained from the shoulder areas of SB I-205 (Hwy 64).

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 Consultant Engineers, Jerome D. Lane, 503-589-4100

Facility construction: 2006

Contractor: Oregon 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 facility is located in the median area of I-205 (Hwy 64) at approximately mile point 5 when traveling along I-205 (Hwy 64), approximately one mile west of the 10th Street Interchange in West Linn, Oregon. An access driveway is located along the left shoulder of southbound I-205.

Highway runoff in the form of sheet flow is conveyed to the facility. Stormwater is both treated and detained in the facility as necessary while it flows eastward toward an outlet control structure before being redirected to the north via a 15-inch pipe. The water is finally conveyed to an outfall and a nearby ditch adjacent to southbound I-205; see Point C, on the Operational Plan, Appendix A. The outlet control structure itself (Point B on the Operational Plans) contains a 3-inch orifice which controls the flow of water, being released from the facility – and detains higher flows unable to pass through the orifice until the peak rainfall/flow event passes.

A. Maintenance equipment access:

Access to the facility is gained from the left most travel lane of southbound I-205. A paved access area east of the swale allows the offloading of heavy equipment.

B. Heavy equipment access into facility:

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

C. Special Features:

- Amended Soils
- Porous Pavers
- Liners
- Underdrains

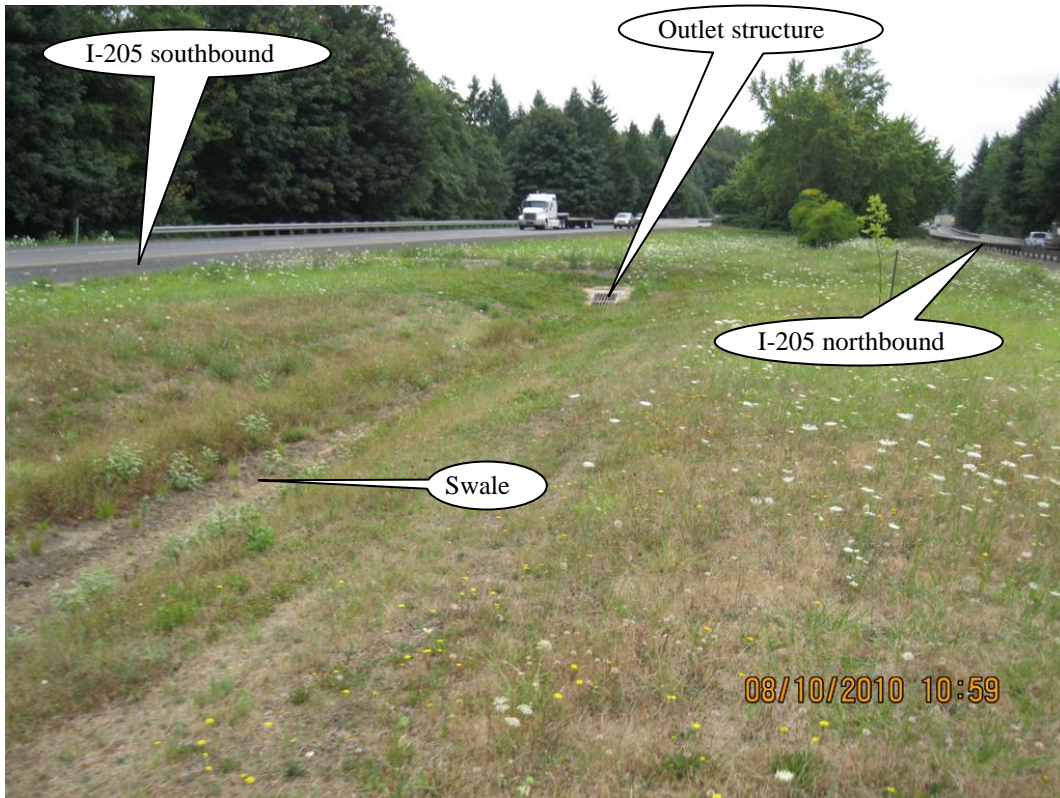


Photo 1: Looking east toward the outlet control structure and southbound I-205.

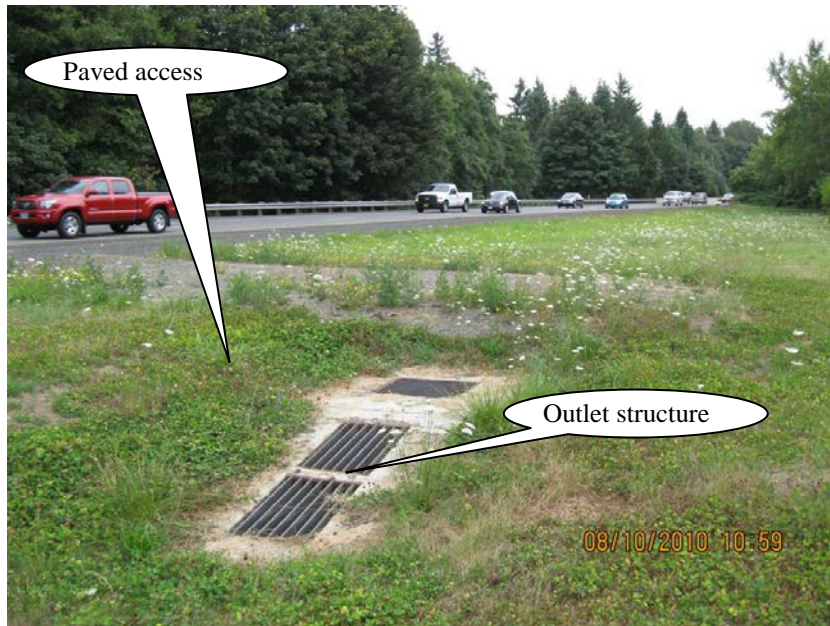


Photo 2: Looking east at the outlet control structure and the access driveway.



Photo 3: Lower and upper sections of the outlet control structure, showing 3-inch orifice and outlet pipe.

5. Facility Haz Mat Spill Feature(s)

The detention pond/water quality biofiltration swale can be used to store a volume of liquid by blocking the 15-inch diameter outlet pipe located at the outlet of the detention pond/water quality biofiltration swale. This pipe is noted as Point C on the Operational 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

The outlet control structure has a pair of grated inlets positioned above the main inlet, so that in the case of high flows, during a peak rainfall event, water will flow into either of the upper grated inlet/outlets and exit out of a 15-inch outlet pipe found within the main structure (Point B on the Operational Plan).

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>

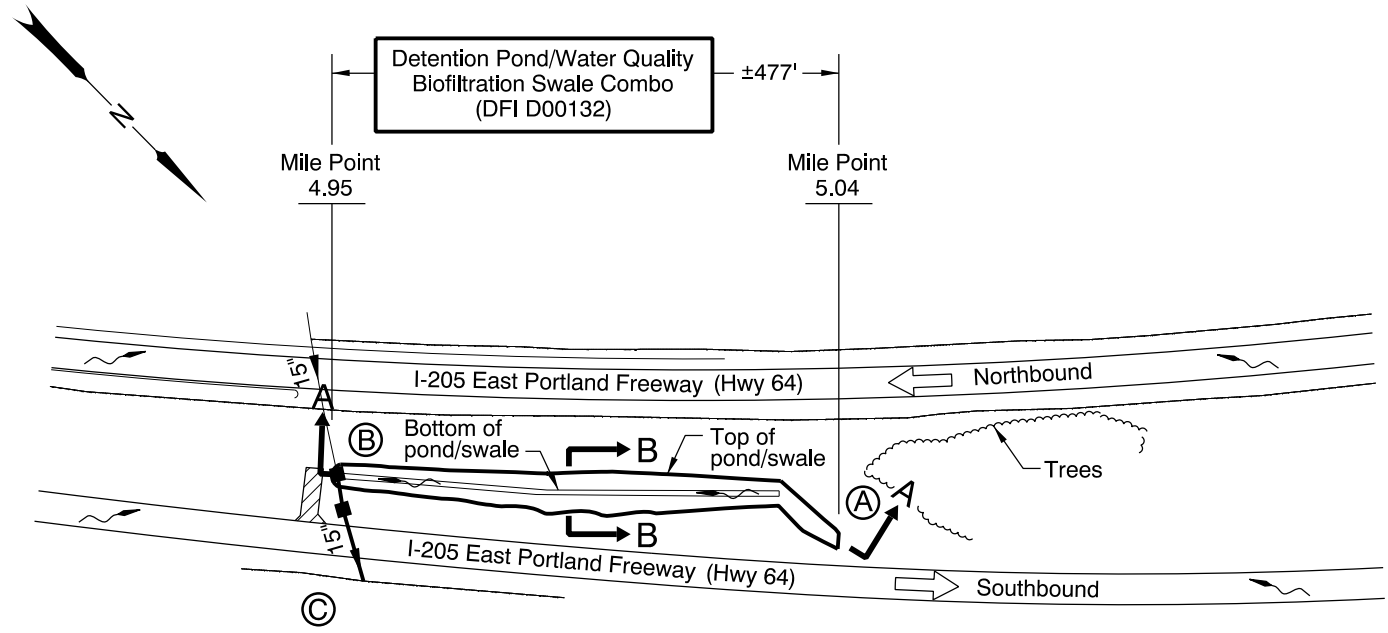
Contact any of the following for more detailed information about management of waste materials found on site:

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

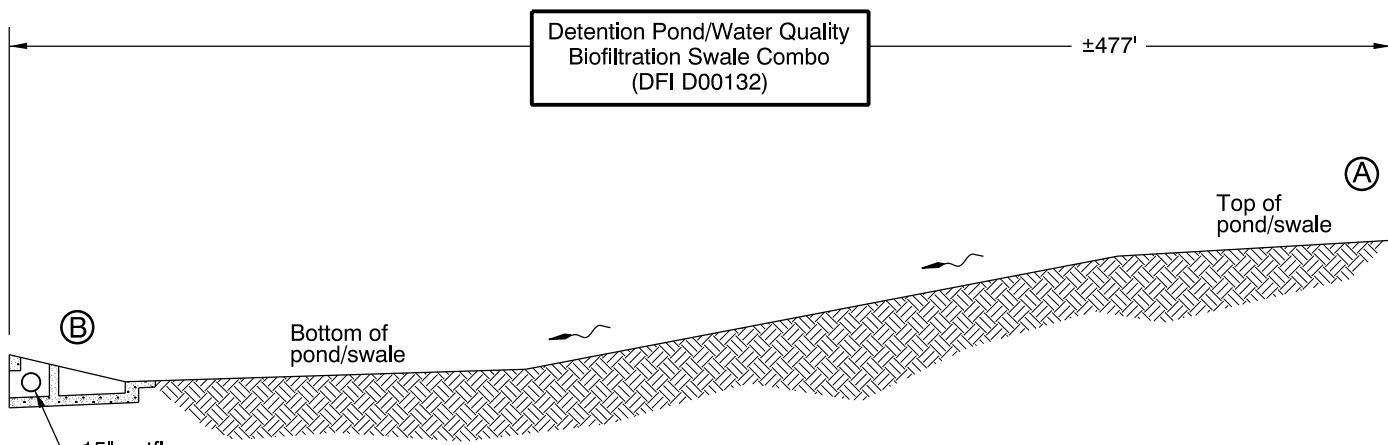
Appendix A

Content:

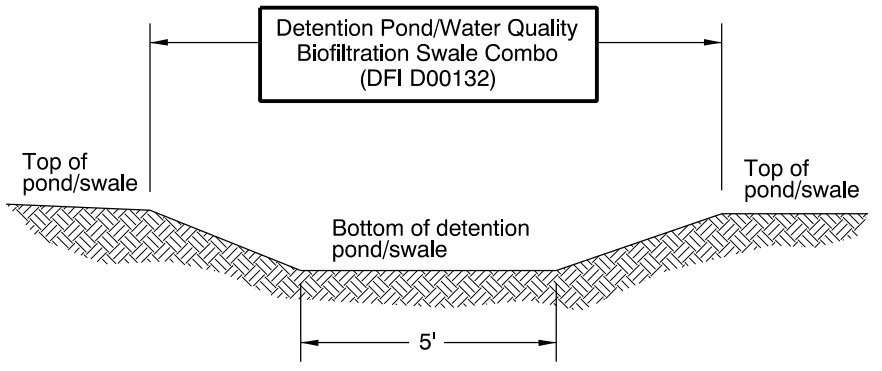
- **Operational Plan and Profile Drawing(s)**



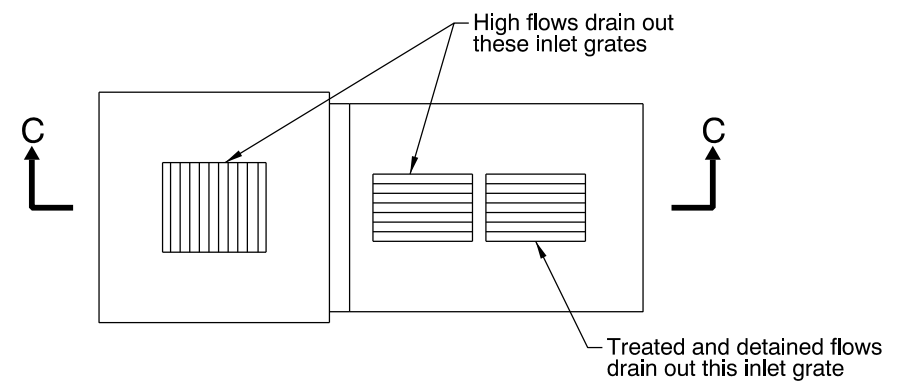
PLAN
N.T.S.



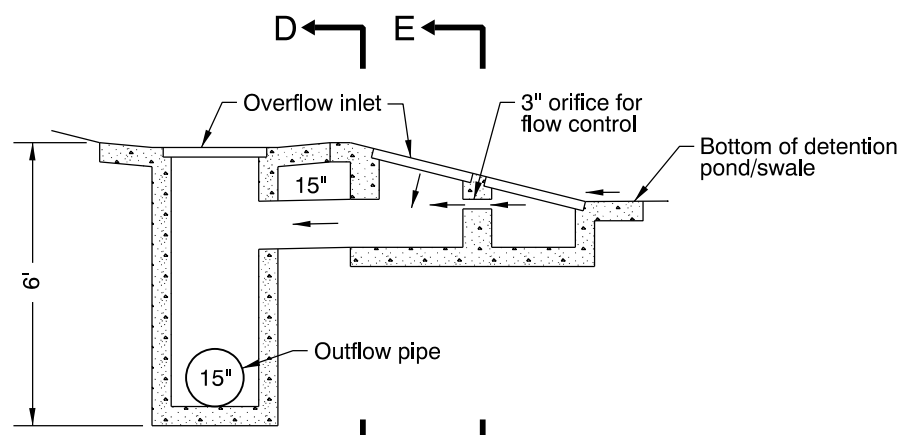
SECTION A-A
N.T.S.



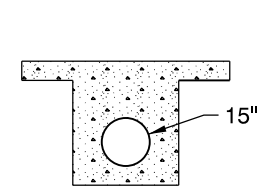
SECTION B-B
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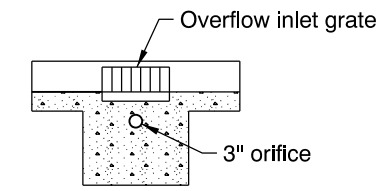
OUTLET STRUCTURE PLAN
N.T.S.



SECTION C-C
N.T.S.



SECTION D-D
N.T.S.



SECTION E-E
N.T.S.

- LEGEND:**
- Photo Location / Direction
 - Detention Pond / Swale Inlet
 - Outlet Structure
 - Outfall
 - and Manhole
 - and Inlet
 - Traffic direction / Flow
 - 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: Y. Garzenelli

DFI D00132
MAINTENANCE DISTRICT 2B HWY 64
DETENTION POND/WQ SWALE COMBO
EAST PORTLAND FREEWAY MP 4.95-5.04
CLACKAMAS COUNTY

Appendix B

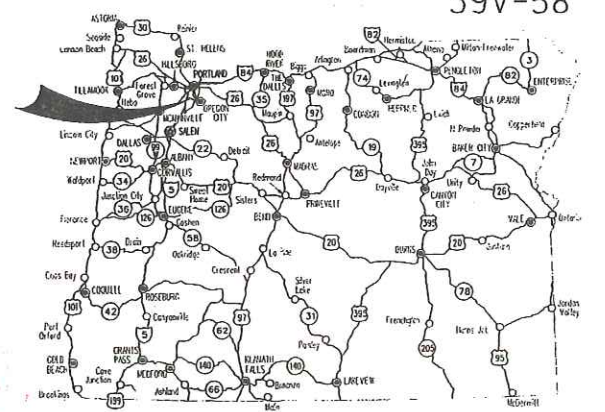
Content:

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

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**

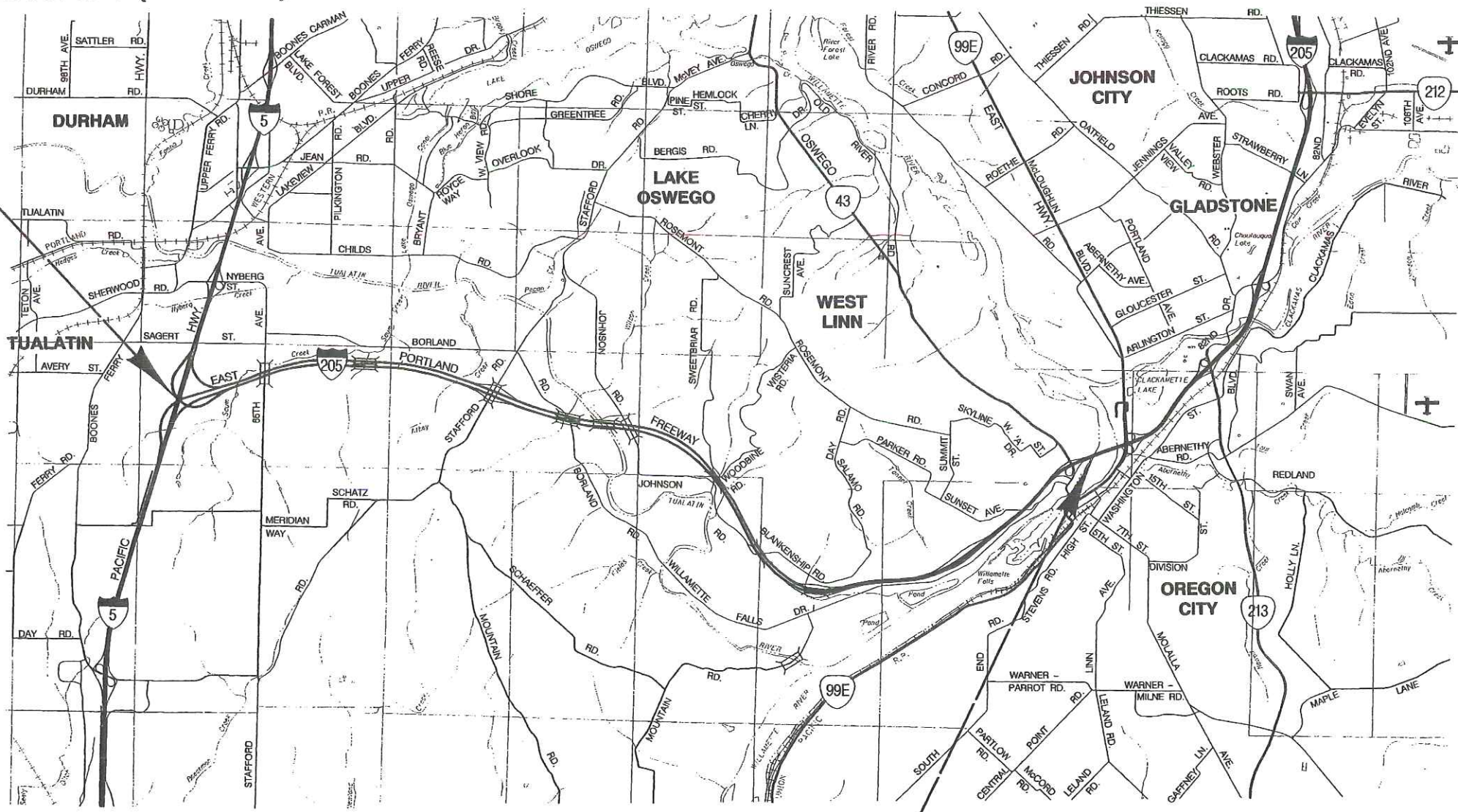


Overall Length Of Project - 8.90 Miles

"AS CONSTRUCTED"
Matthew Nelson
 Date 6/26/09 Project Mgr

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.)

**END OF PROJECT IM-OTIA-S064(032)
 STA. "LS2" 1231+71.15 (M.P. -0.10)**



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 Garrett | DIRECTOR OF TRANSPORTATION |



EXPIRES: 12/31/07

LAWRENCE H. FOX
 OBEC CONSULTING ENGINEERS - PROJECT MANAGER

OREGON DEPARTMENT OF TRANSPORTATION
 CONCURRENCE
Harold E. Suley 2/23/06
 TECHNICAL SERVICES MANAGING ENGINEER DATE

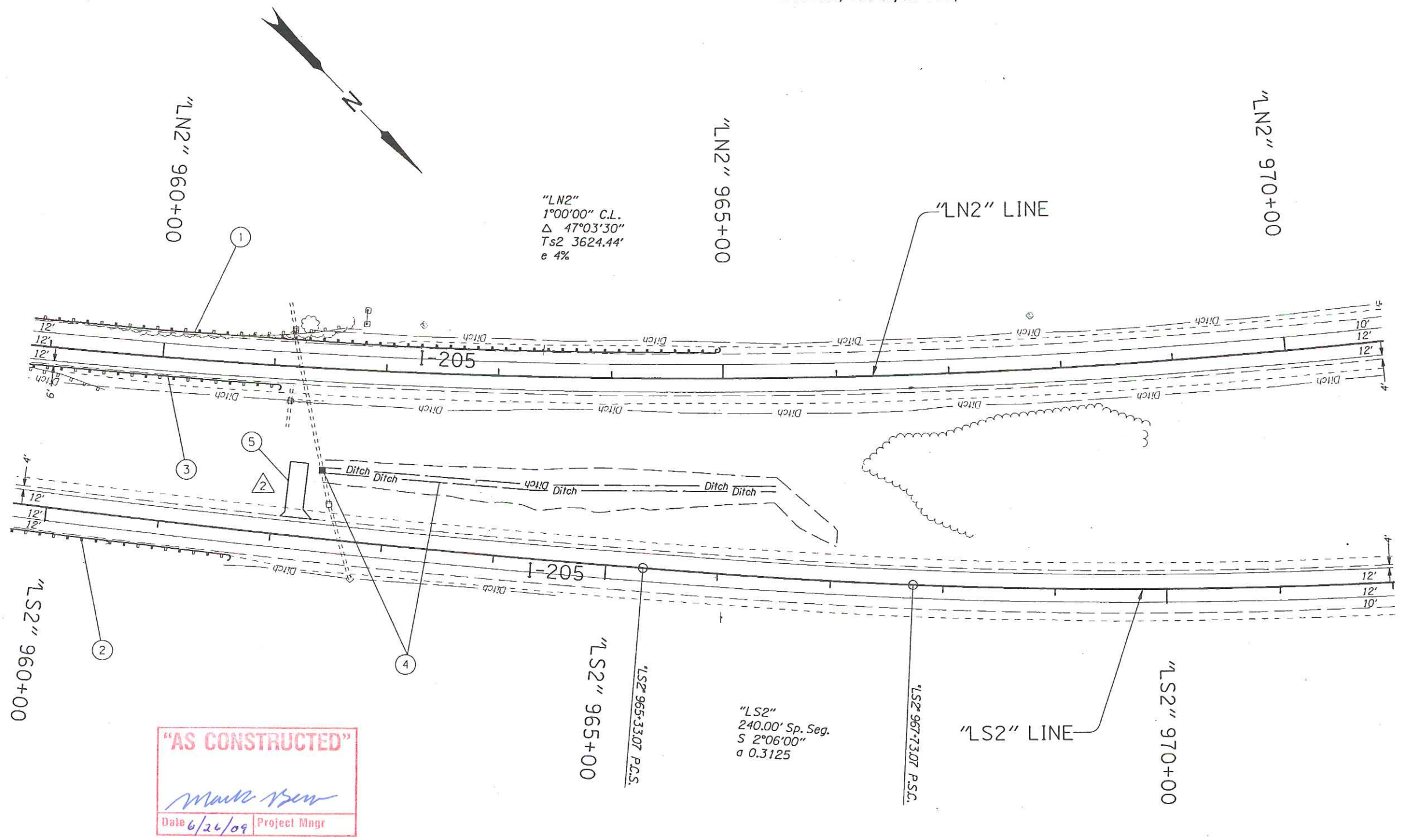
**I-205: WILLAMETTE RIVER BR. -
 PACIFIC HWY. (UNIT 3) SEC.
 EAST PORTLAND FREEWAY
 CLACKAMAS & WASHINGTON COUNTIES**

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



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)**



- ① See Sht. 19A, Note 3
Remove Extg. Guardrail
Const. Guardrail (Type 2A)
Const. Guardrail Terminal, Non-Flared (50')
Flare Rate=0, W=1', E=0
- ② See Sht. 19A, Note 6
Remove Extg. Guardrail
Const. Guardrail (Type 2A)
Const. Anchor (Type 1 Mod)
Inst. End Piece (Type B)
- ③ See Sht. 19A, Note 4
Remove Extg. Guardrail
Const. Guardrail (Type 2A)
Const. Guardrail Terminal, Non-Flared (50')
Flare Rate=0, W=1', E=0
- ④ Const. Bio-Swale/Detention Pond A
Ditch Exc. - 710 Cu.Yd.
Inst. Outlet Structure
(For Details, See Sht. GJ-1)
- ⑤ Sta. "LS2" 962+20, Lt.
Const. Aggr. Maintenance Pad (50')
Embankment - 25 Cu.Yd.
Aggregate - 60 Tons
(For Details, See Sht. 2B-26)

"AS CONSTRUCTED"
Mark N. Sen
 Date 6/26/09 Project Mngr

REVISIONS	
①	Revised 04-10-2006 Revised Note
②	Revised 04-10-2006 Added Maintenance Pad



LEGEND
 ■ Outlet Structure

Parametrix

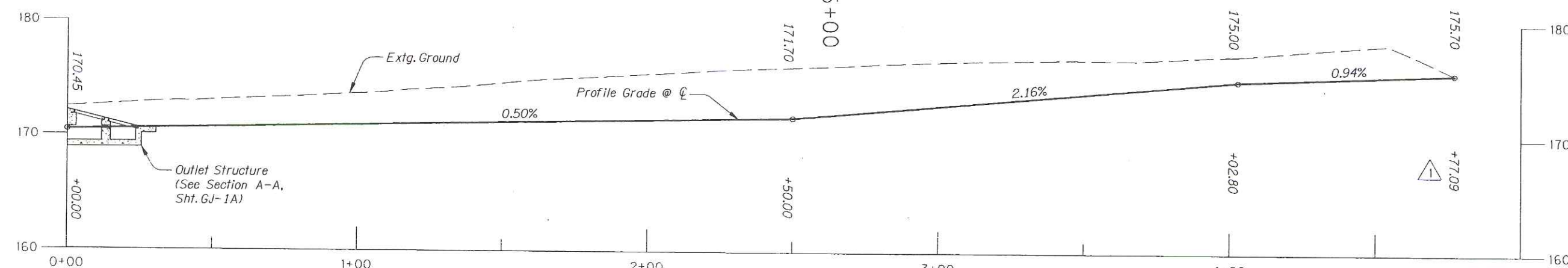
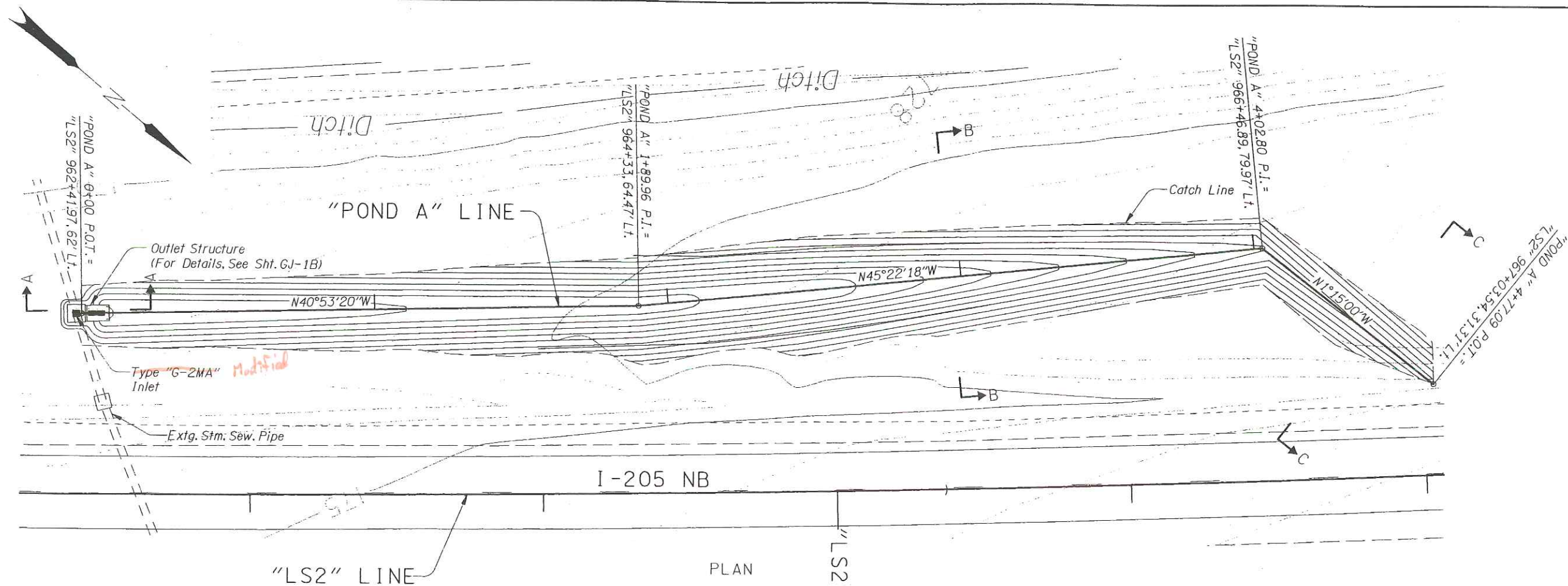
OREGON DEPARTMENT OF TRANSPORTATION
ROADWAY ENGINEERING SECTION

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

Design Team Leader - Brian Bierwagen
 Designed By - Jim Phillips
 Drafted By - Ron Ricks

ALIGNMENT AND GENERAL CONSTRUCTION

SHEET NO. 20



NOTE:
For Sections Not Shown,
See Sht. GJ-1A.
For Outlet Structure Details,
See Sht. GJ-1B.

"AS CONSTRUCTED"
Mathew Bunde
Date 6/26/09 Project Mngr

REVISIONS	
1	Revised 04-10-2006 Revised Sta. Callout

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

**OREGON DEPARTMENT OF TRANSPORTATION
ROADWAY ENGINEERING SECTION**

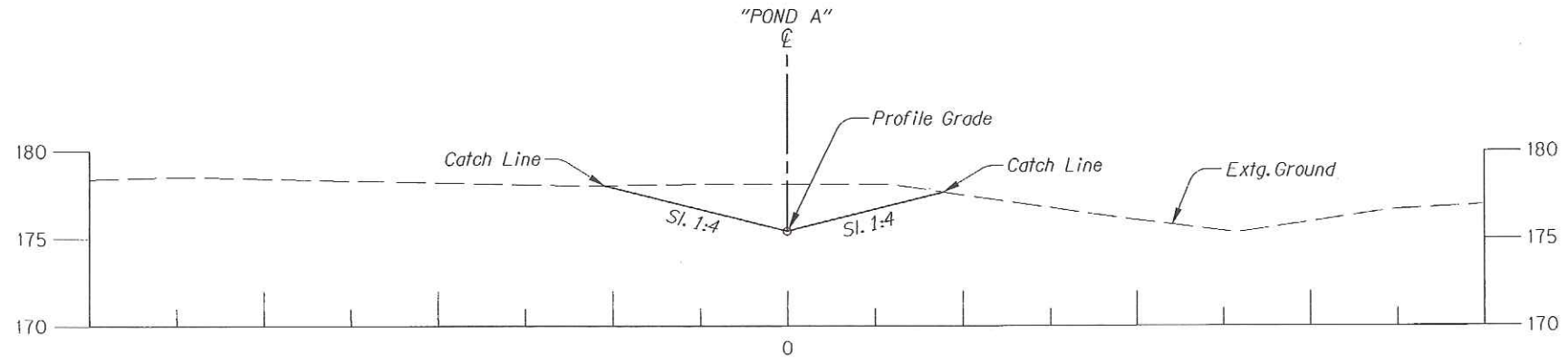
**I-205: WILLAMETTE RIVER BR. -
PACIFIC HWY. (UNIT 3) SEC.
EAST PORTLAND FREEWAY
CLACKAMAS & WASHINGTON COUNTIES**

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

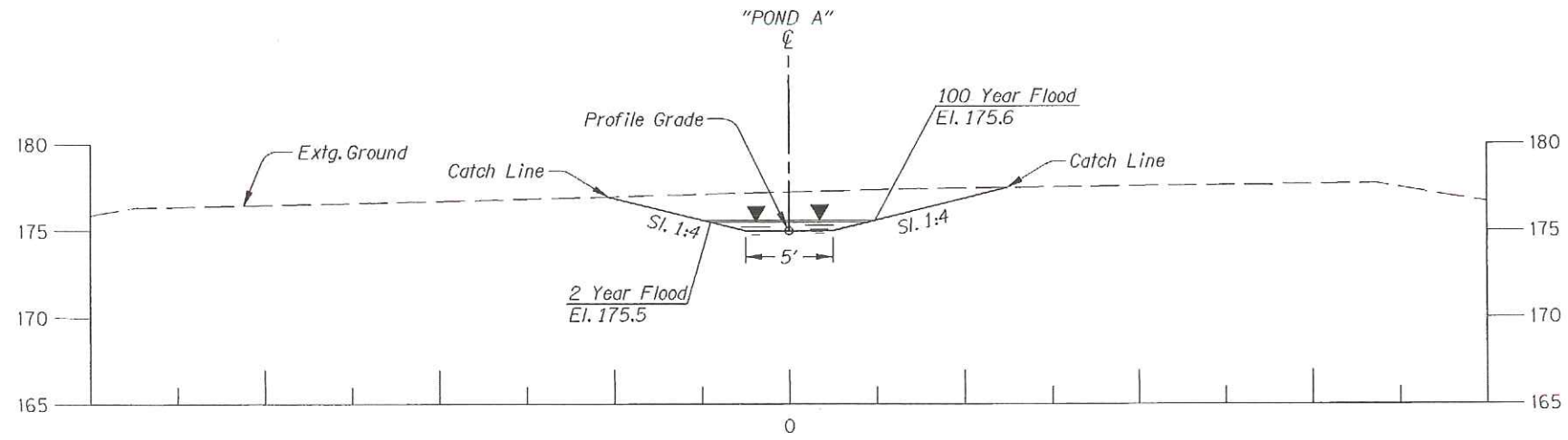
**POND A
PLAN AND PROFILE**

SHEET NO. GJ-1

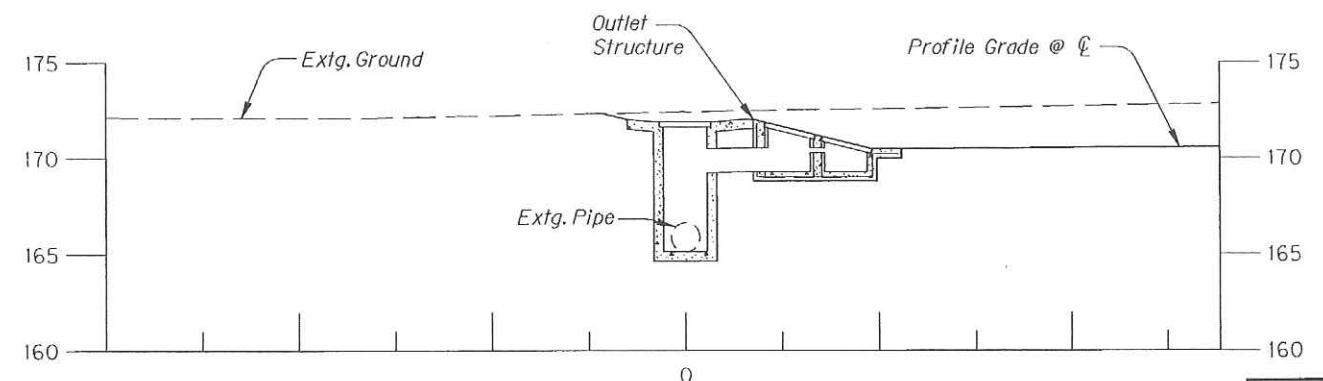
OBEC CONSULTING ENGINEERS
www.obec.com
Corporate Office: 820 COUNTRY CLUB ROAD, SUITE 100B EUGENE, OREGON 97401-6099
2235 MISSION STREET SE, SUITE 100 SALEM, OREGON 97302-1296
1335 POPLAR DRIVE MEDFORD, OREGON 97504-5207



SECTION C-C



SECTION B-B



SECTION A-A

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

REGISTERED PROFESSIONAL
 ENGINEER
 12295
Jerome D. Lane
 OREGON
 JULY 5, 1983
 JEROME D. LANE
 EXPIRES: 12/31/08

OREGON DEPARTMENT OF TRANSPORTATION
 ROADWAY ENGINEERING SECTION

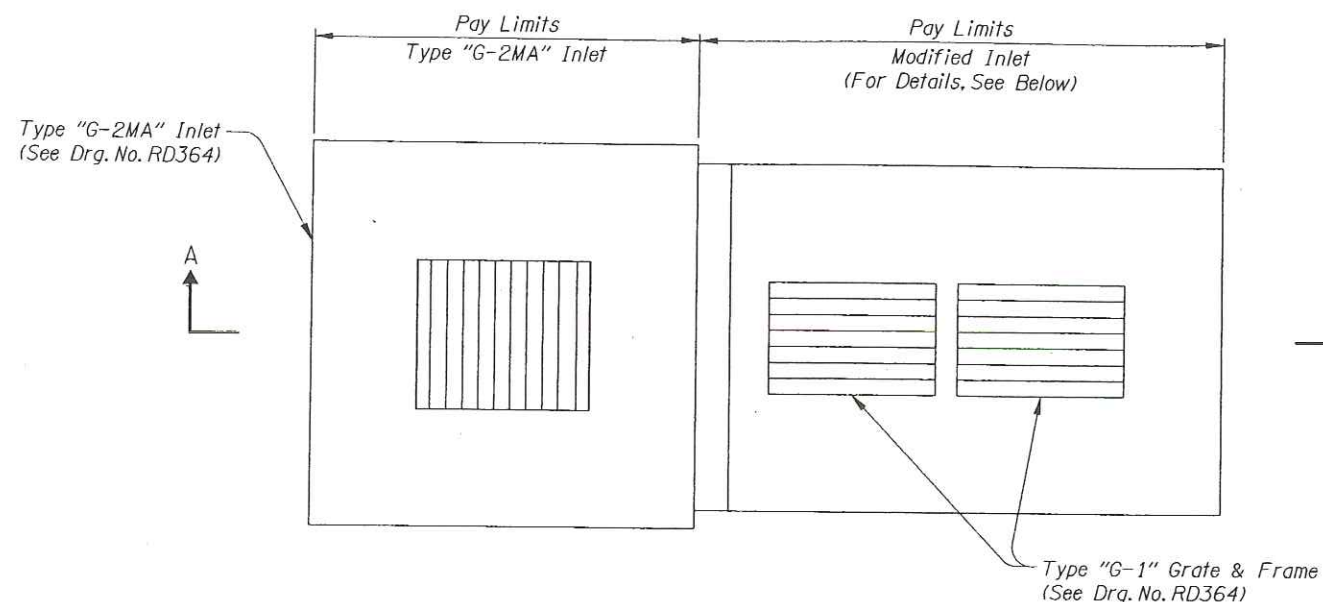
I-205: WILLAMETTE RIVER BR. -
PACIFIC HWY. (UNIT 3) SEC.
 EAST PORTLAND FREEWAY
 CLACKAMAS & WASHINGTON COUNTIES

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

POND A
CROSS SECTIONS

SHEET NO.
GJ-1A

CONSULTING ENGINEERS
 Corporate Office: 920 COUNTRY CLUB ROAD, SUITE 100B EUGENE, OREGON 97401-9089
 2235 MISSION STREET SE, SUITE 100 SALEM, OREGON 97302-1286
 1335 POPLAR DRIVE MEDFORD, OREGON 97504-5207
 www.obec.com



PLAN

GENERAL NOTES:

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

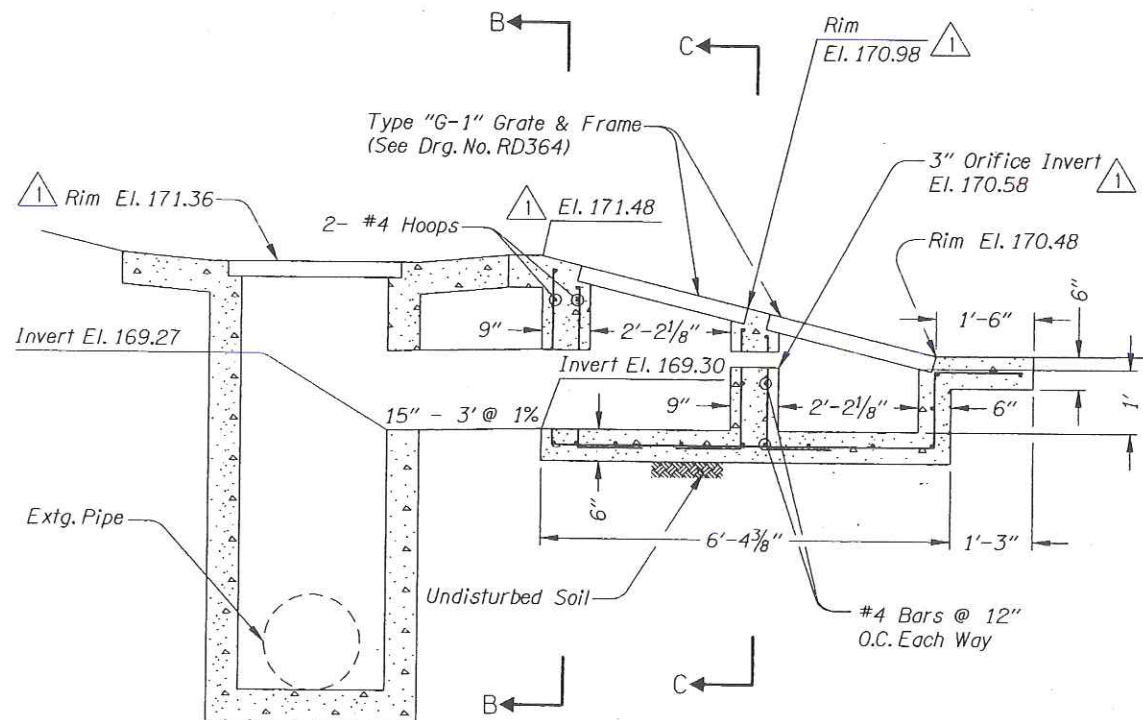
All Reinforcement Steel Shall Conform To Astm Specification A615, Grade 60 Or A706.

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"

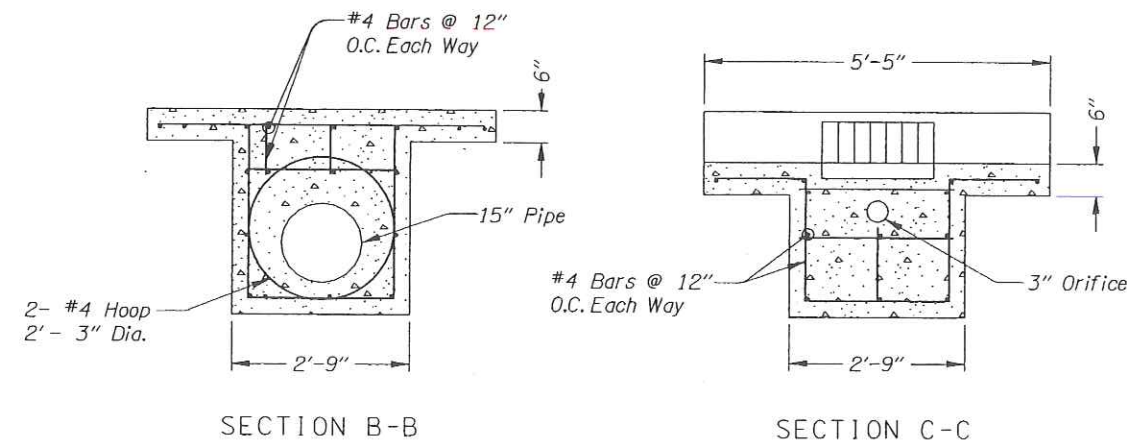
All Bars Shall Be Placed 2" Clear Of The Nearest Face Of Concrete Unless Shown Otherwise.

Concrete Shall Be Commercial Grade Concrete ODOT Section 00440.



SECTION A-A

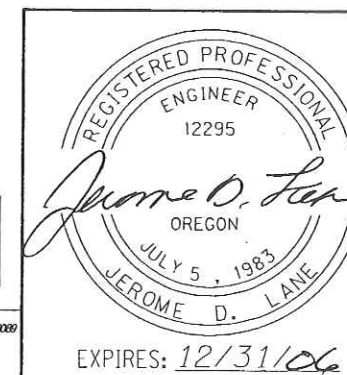
OUTLET STRUCTURE



SECTION B-B

SECTION C-C

REVISIONS	
△	Revised 03-23-2006
	Revised Elevations



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 A
DETAILS

SHEET
NO.
GJ-1B