

OPERATION & MAINTENANCE MANUAL

DFI No. : D00678

Facility Type: Bio-Retention Pond



[April, 2018]

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1. Identification

Drainage Facility ID (DFI): **D00678**
Facility Type: Detention Pond
Construction Drawings: (V-File Number) 46V-022
Location: District: 2B
Highway No.: 75
Mile Post: (5.48 to 5.57) Hwy 75
Description: This facility is located north of the Sunrise Corridor.

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 Consulting Engineers, Amy Jones, 971-634-2005]

Facility construction: [2014]

Contractor: Kerr Contractors, Inc.

4. Storm Drain System and Facility Overview

A bio-retention pond is a basin that is designed to capture the water quality design volume and filter out the pollutants by filtering the runoff through the water quality mix constructed in the pond bottom. The filtration process removes a variety of pollutants through physical,

biological and chemical treatment mechanisms. The water in the facility exits through an under drain pipe below the water quality mix. The outlet control structure limits the rate of runoff leaving the pond by using an orifice. These facilities are designed to infiltrate the water quality design storm volume within 36 hours. The sizing of these facilities depends on the location and the amount of contributing impervious area.

This bio-retention pond is designed to store runoff during wet weather and is dry the remainder of the time. It is located at in the northwest quadrant of the intersection of the Sunrise Corridor and the Clackamas Highway. Access to the facility is provided with an access road connecting to the highway shoulder.

There is one storm drain pipe that conveys stormwater runoff from paved areas along the Sunrise Corridor alignment. The location of this is noted on the Operation Plan as point A in Appendix A

Runoff exits the pond by way of two Type "D" inlets connected to 12-inch storm drain pipe that connects to a manhole containing the flow control assembly. See Photo 1 and Point C on the Operational Plan in Appendix A.

The storm drain outlet pipe from the flow control manhole connects to a manhole that connects to the auxiliary outfall. The storm drain pipe from the auxiliary outfall is 24-inches in diameter and connects to a pipe system that connects to the existing 60-inch pipe in the Clackamas Highway. The receiving waterway for the outlet pipe is the Clackamas River.

A. Maintenance equipment access:

The pond and outlet structures can be accessed from a maintenance access road. See maintenance access road layout on the Operational Plan in Appendix A

B. Heavy equipment access into facility:

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

C. Special Features:

- Amended Soils
- Porous Pavers
- Liners
- Underdrains

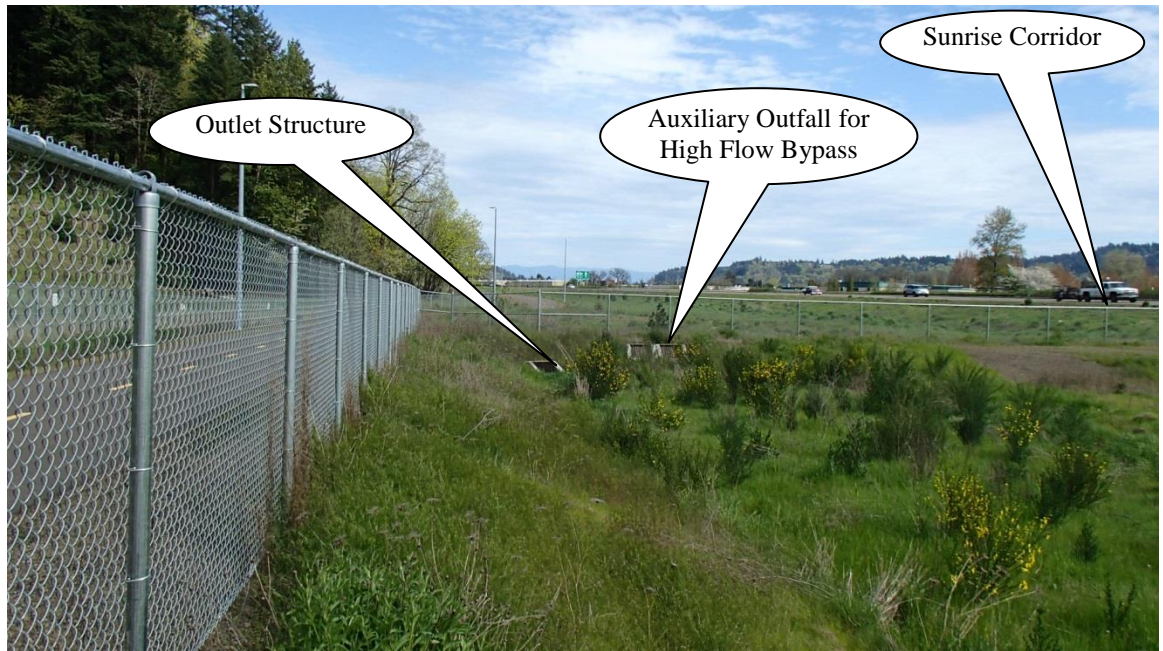


Photo 1: a view of bio-retention pond, looking East toward outlets.

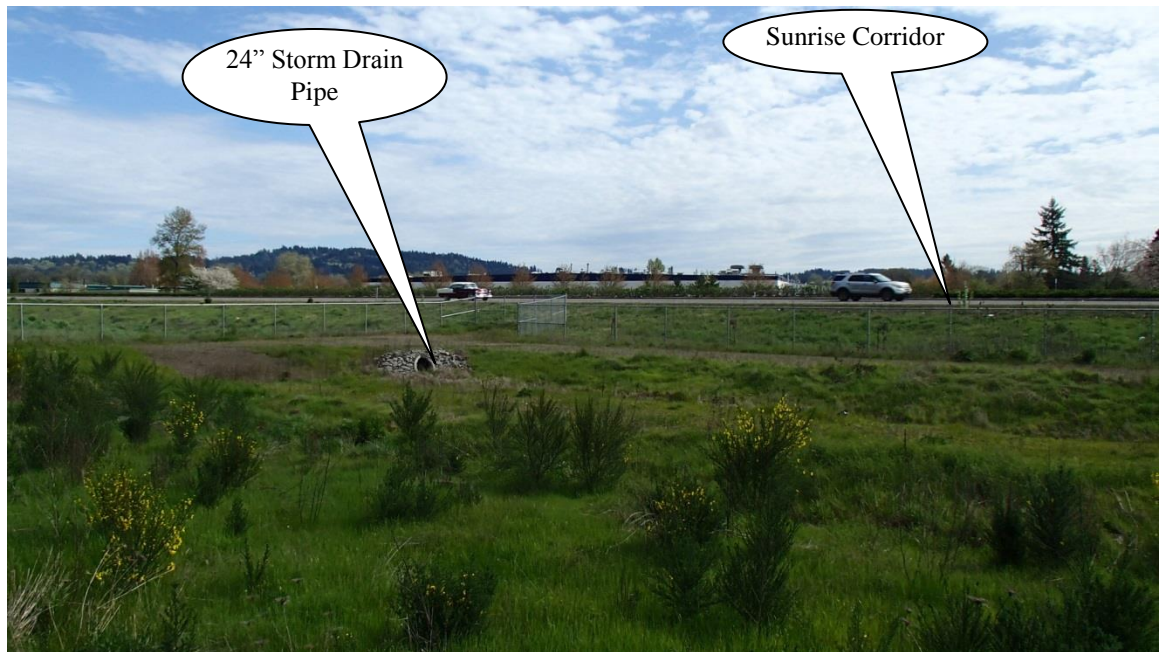


Photo 1: a view of bio-retention pond, looking Southeast toward storm drain pipe.

5. Facility Haz Mat Spill Feature(s)

The pond can be used to store a volume of liquid by blocking the 12-inch diameter outlet pipe with the Type “D” inlet located at the outfall structure in the middle of the south side of the pond. This pipe is noted as point C in the Operational Plan. A barrier such as a metal plate over the metal grate on the inlet could be used to prevent liquid from draining from the pond. There is an underdrain system that will also need to be blocked by plugging the pond flow control outlet in the flow control manhole.

6. Auxiliary Outlet (High Flow Bypass)

Auxiliary Outlets are provided if the primary outlet control structure cannot safely pass the projected high flows. Broad-crested spillway weirs and over flow risers are the two most common auxiliary outlets used in stormwater 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

High flows exit the pond through the auxiliary outlet structure consisting of two type “D” inlets. These inlets connect to the outfall pipe from the main outfall and flow control structure. See Photo 1 and Point E in the Operational Plan in Appendix A.

Other, as noted below

There is an underdrain pipe system designed to provide infiltration for the pond.

One sediment forebay is constructed to provide pretreatment. It is located in the southeast corner of the pond. See Point B in the Operational Plan in Appendix A.

The pond was designed to allow 6” of sediment storage prior to the outfall. This needs to be removed periodically as required.

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>

The following stormwater facility maintenance table (See ODOT Maintenance Guide) should be used to maintain the facility outlined in this Operation and Maintenance Manual:

- 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

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) 731-8290
ODEQ Northwest Region Office	(503) 229-5263

Appendix A

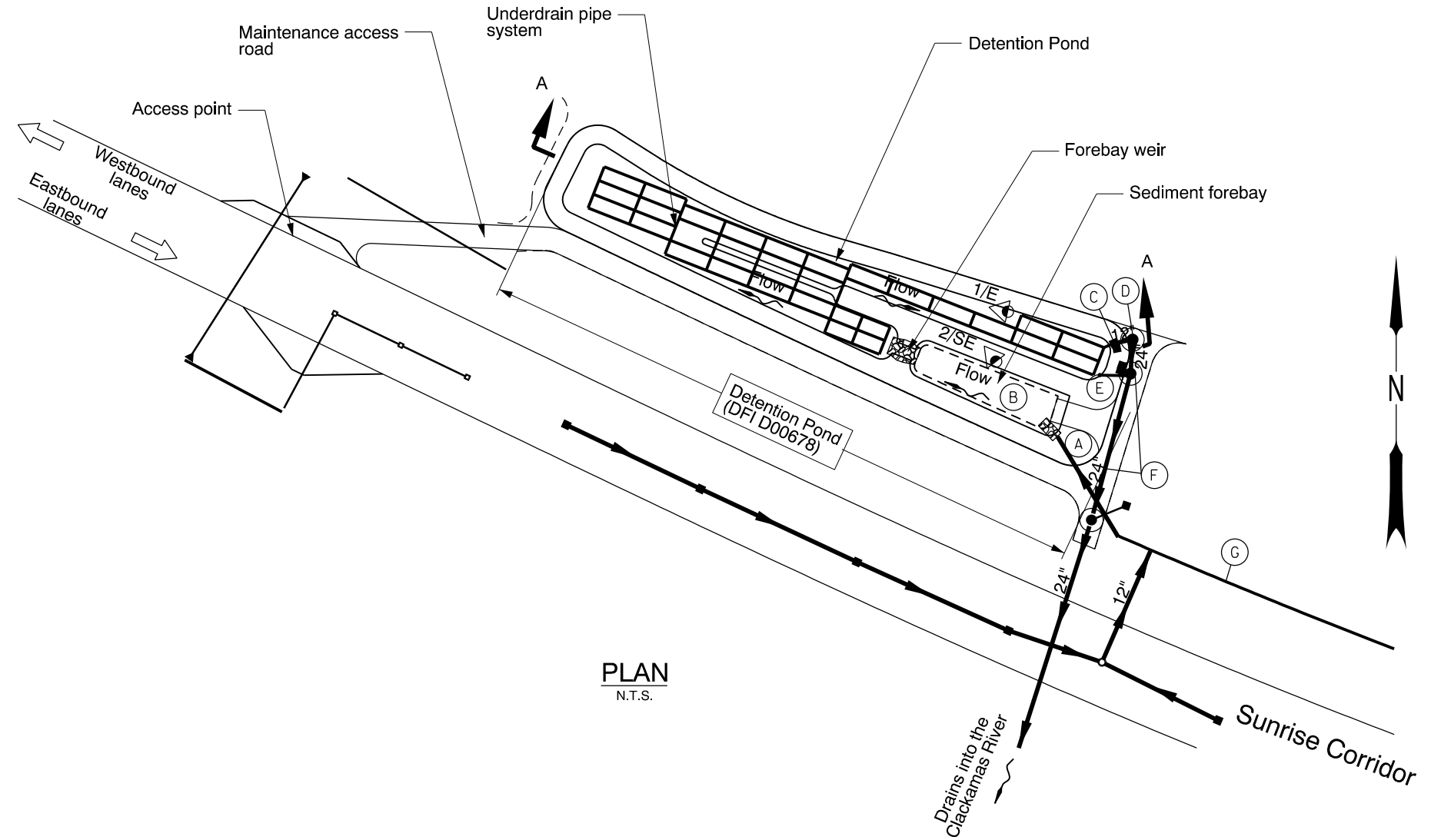
Content:

- **Operational Plan and Profile Drawing**

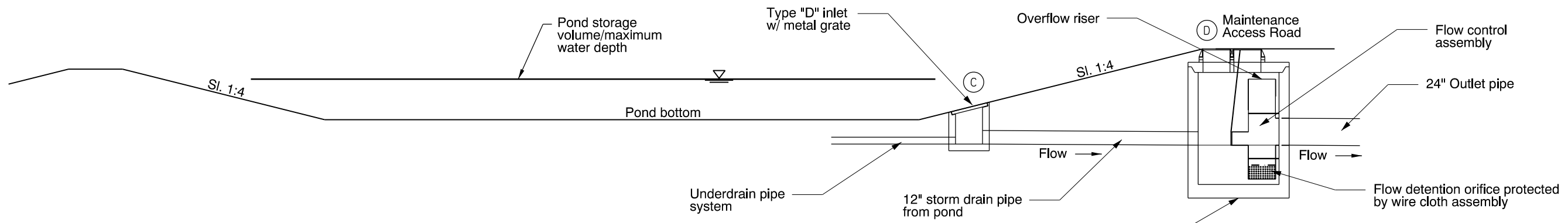
LEGEND:

- ◁ Photo Location / Direction
- Ⓐ 24" Storm drain pipe outfalls into pond
- Ⓑ Sediment forebay
- Ⓒ Outlet structure and 12" storm drain pipe
- Ⓓ Pond flow control manhole structure
- Ⓔ Auxiliary Outfall for High flow bypass
- Ⓕ 72" manhole and 24" storm drain pipe outlet
- Ⓖ Drainage ditch draining to pond

- and ○ Manhole
- and □ Inlet
- Storm Pipe (Facility)
- Storm Pipe (Not connected to facility)
- Storm Pipe (Existing)
- Conveyance Direction
- ↪ Pavement / Facility Flow Path



PLAN
N.T.S.



SECTION A-A
N.T.S.

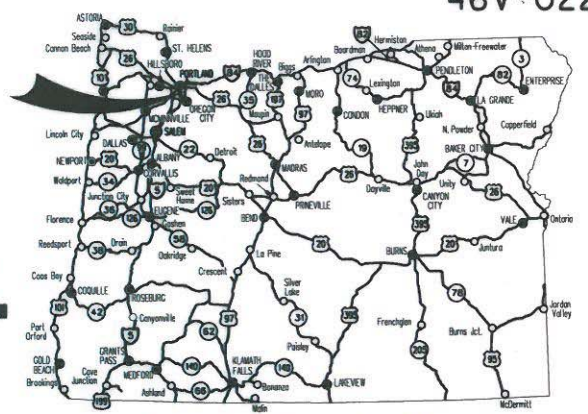
OREGON DEPARTMENT OF TRANSPORTATION	
DFI D00678 MAINTENANCE DISTRICT 2B HWY 75 BIO-RETENTION POND HIGHWAY MP 5.48 to MP 5.57 CLACKAMAS COUNTY	
Prepared By:	Amy Jones
Drafted By:	Amy Jones

Appendix B

Content:

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

STATE OF OREGON
 DEPARTMENT OF TRANSPORTATION
 PLANS FOR PROPOSED PROJECT
**GRADING, DRAINAGE, STRUCTURES, PAVING, SIGNING,
 ILLUMINATION, SIGNALS & ROADSIDE DEVELOPMENT**



Overall Length Of Project - 3.90 Miles

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

FFO - OR212/224: SUNRISE CORRIDOR (I-205 - SE 122ND AVE) SEC.

**CLACKAMAS HWY.
 CLACKAMAS COUNTY
 MARCH 2013**

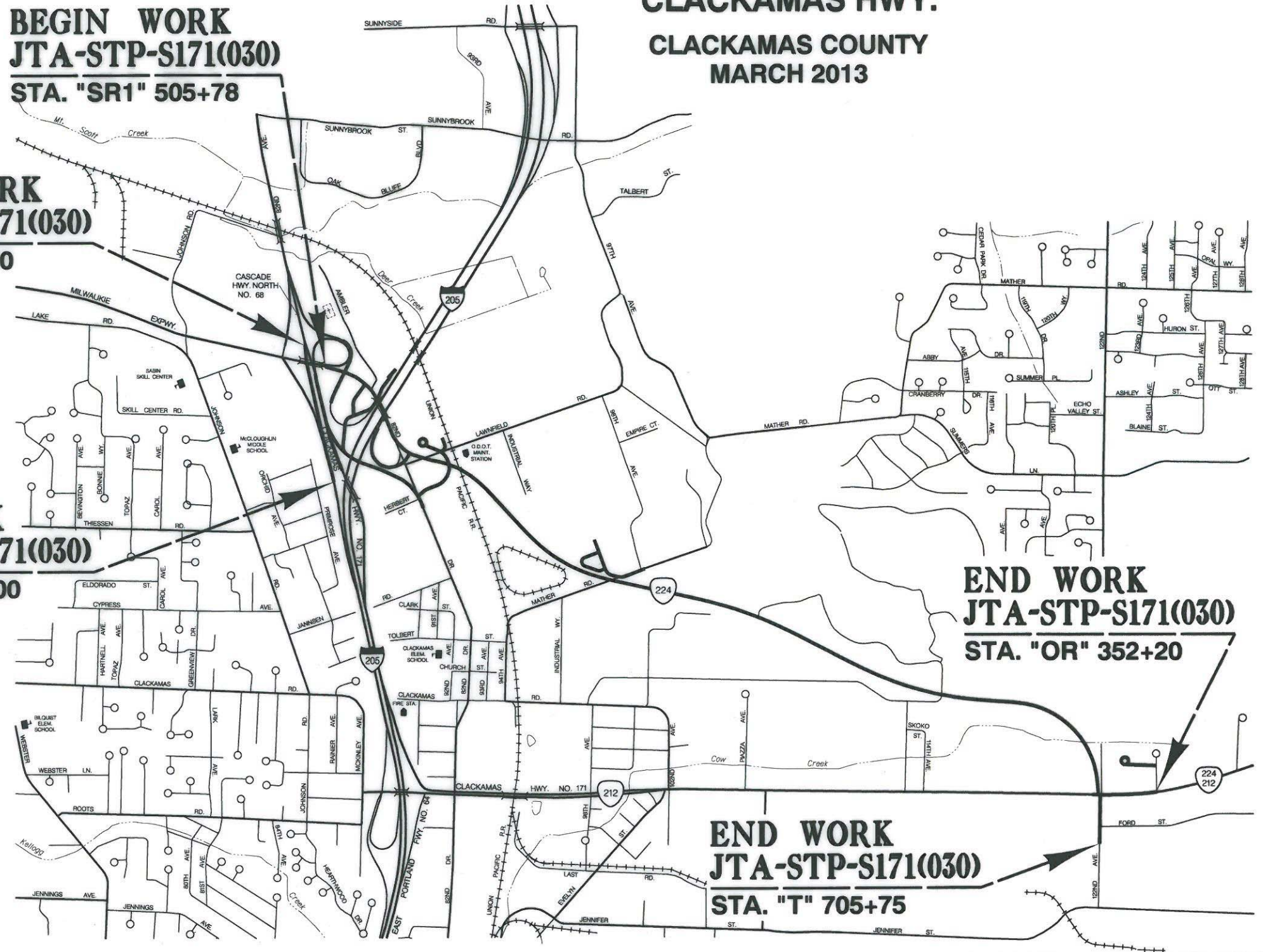
**BEGIN WORK
 JTA-STP-S171(030)
 STA. "SR1" 505+78**

**BEGIN WORK
 JTA-STP-S171(030)
 STA. "G" 463+00**

**END WORK
 JTA-STP-S171(030)
 STA. "G" 492+00**

**END WORK
 JTA-STP-S171(030)
 STA. "OR" 352+20**

**END WORK
 JTA-STP-S171(030)
 STA. "T" 705+75**



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**
- Pat Egan CHAIR
 - David Lohman COMMISSIONER
 - Mary F. Olson COMMISSIONER
 - Mark Frohnmayer COMMISSIONER
 - Tammy Boney COMMISSIONER
 - Matthew L. Garrett DIRECTOR OF TRANSPORTATION

PLANS PREPARED FOR
 OREGON DEPARTMENT OF TRANSPORTATION

OBEC CONSULTING ENGINEERS
 CORPORATE OFFICE: 920 COUNTRY CLUB ROAD, SUITE 100B EUGENE, OREGON 97401-0089
 REGIONAL OFFICES: LAKE OSWEGO, SALEM, MEDFORD, OREGON; VANCOUVER, WASHINGTON

These plans were developed using ODOT design standards. Exceptions to these standards, if any, have been submitted and approved by the ODOT Chief Engineer or their delegated authority.

Approving Authority: *Lawrence H. Fox* 12/31/12
 Signature & date

LAWRENCE H. FOX - PROJECT MANAGER
 Print name and title

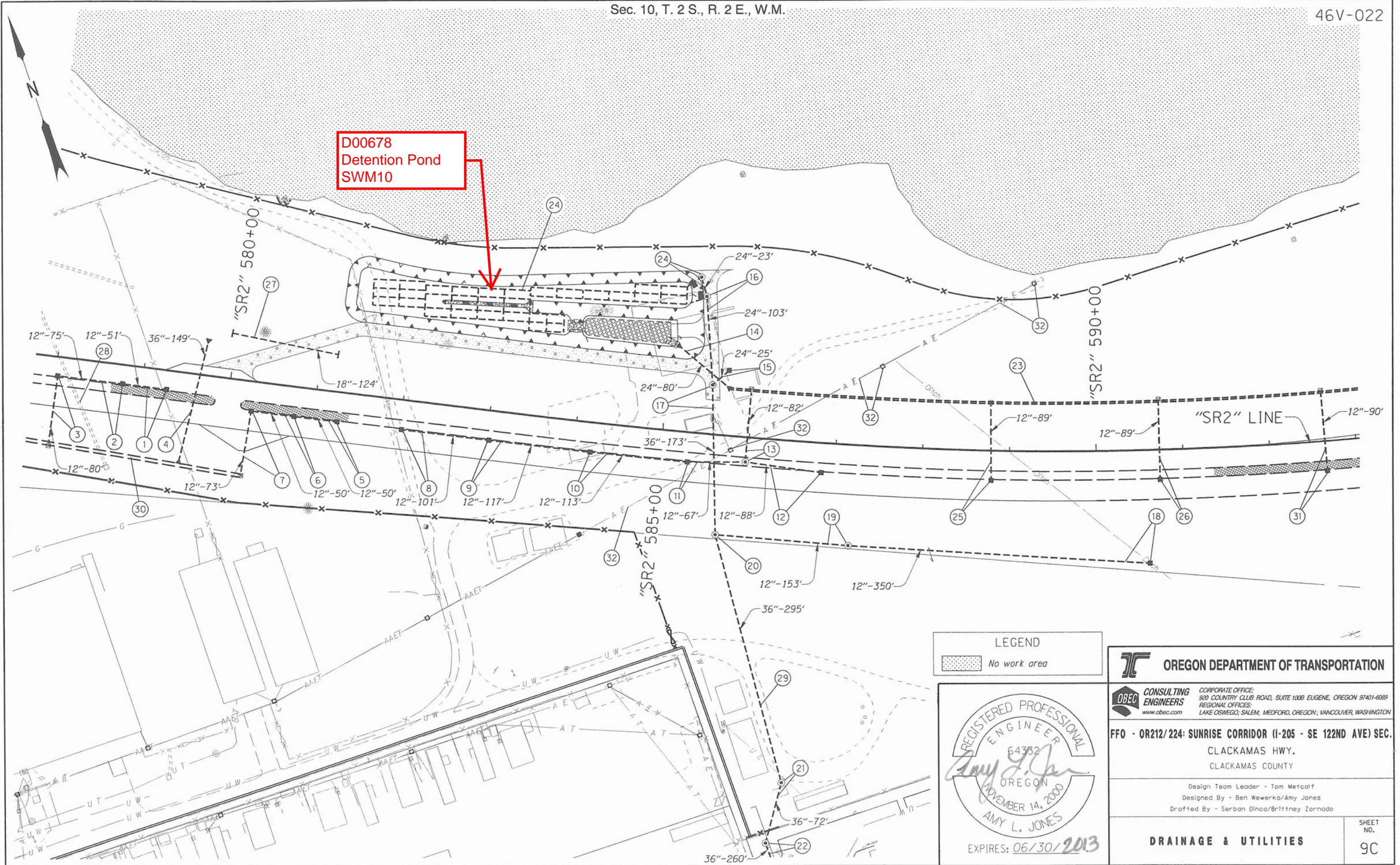
Concurrence by ODOT Chief Engineer

**FFO - OR212/224: SUNRISE CORRIDOR (I-205 - SE 122ND AVE) SEC.
 CLACKAMAS HWY.
 CLACKAMAS COUNTY**

FEDERAL HIGHWAY ADMINISTRATION	PROJECT NUMBER	SHEET NO.
OREGON DIVISION	JTA-STP-S171(030)	1

SEC. 4, 5, 9, 10, 11
 T. 2 S., R. 2 E., W.M.

D00678
Detention Pond
SWM10



LEGEND

No work area

REGISTERED PROFESSIONAL
ENGINEER
64332
Amy L. Jones
OREGON
NOVEMBER 14, 2000
AMY L. JONES
EXPIRES: 06/30/2013

OREGON DEPARTMENT OF TRANSPORTATION

OBEC CONSULTING ENGINEERS
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920 COUNTRY CLUB ROAD, SUITE 100B EUGENE, OREGON 97401-6089
REGIONAL OFFICES:
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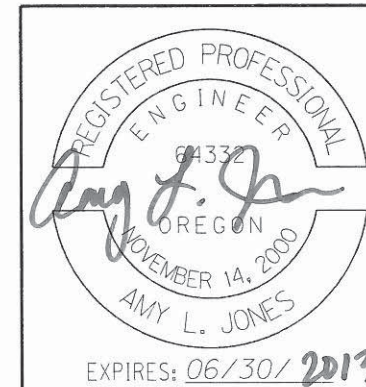
FFO - OR212/224: SUNRISE CORRIDOR (I-205 - SE 122ND AVE) SEC.
CLACKAMAS HWY.
CLACKAMAS COUNTY

Design Team Leader - Tom Metcalf
Designed By - Ben Wewerka/Amy Jones
Drafted By - Serban Dinca/Brittney Zornado

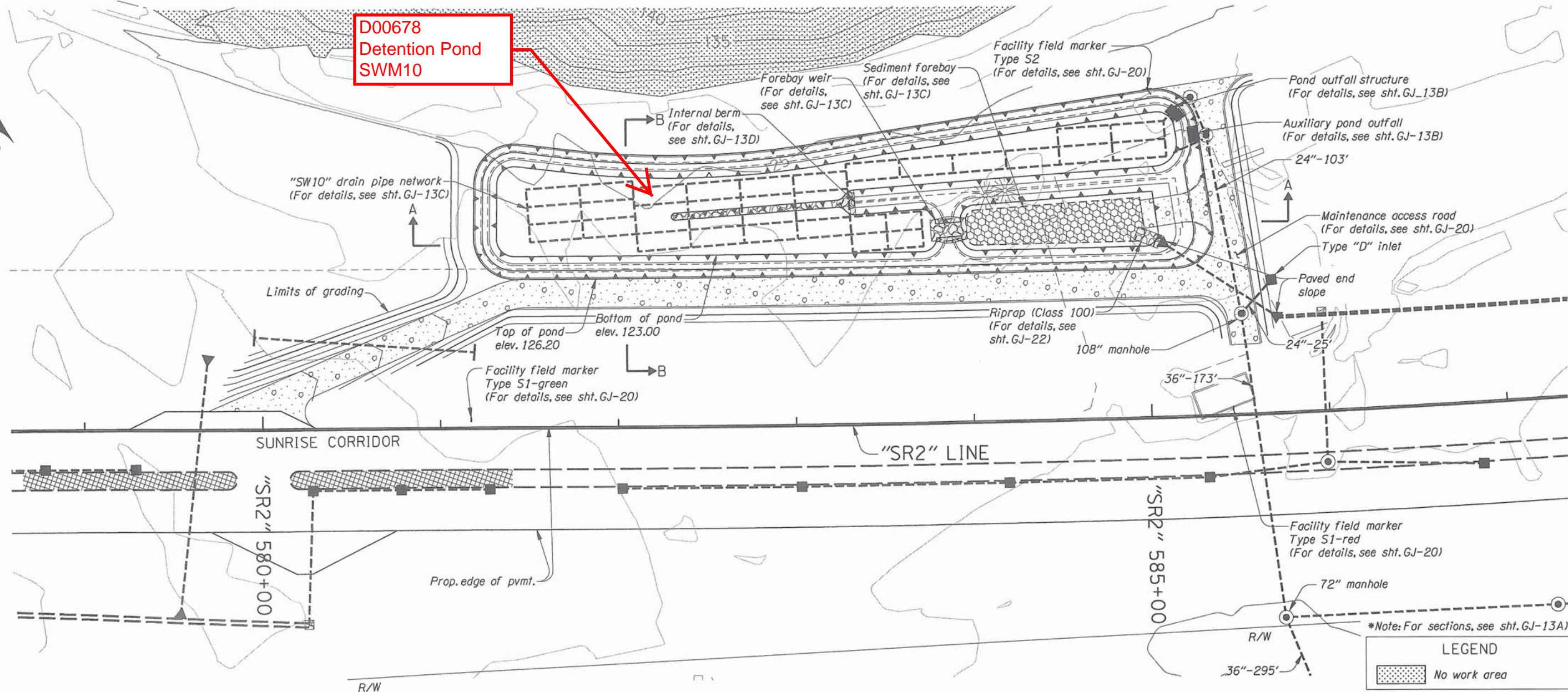
DRAINAGE & UTILITIES

SHEET NO.
9C

- ① Sta. "SR2" 579+28.41, 21.9' Rt.
Const. type "G-2" inlet
Inst. 12" storm sew. pipe - 51'
5' depth
- ② Sta. "SR2" 578+77.62, 21.9' Rt.
Const. type "G-2" inlet
Inst. 12" storm sew. pipe - 75'
5' depth
- ③ See sht. 8D, note 23
Const. type "G-2" inlet
Inst. 12" storm sew. pipe
- ④ Sta. "SR2" 579+52.15, 105.2' Rt. to
Sta. "SR2" 579+69.7, 42.45' Lt.
Inst. 36" culv. pipe - 149'
10' depth
Const. sloped end - 2
Const. paved end slope, Lt. & Rt.
- ⑤ Sta. "SR2" 581+27.44, 34.1' Rt.
Const. type "G-2" inlet
Inst. 12" storm sew. pipe - 50'
5' depth
- ⑥ Sta. "SR2" 580+77.54, 34.1' Rt.
Const. type "G-2" inlet
Inst. 12" storm sew. pipe - 50'
5' depth
- ⑦ Sta. "SR2" 580+27.81, 34.1' Rt.
Const. type "G-2" inlet
Inst. 12" storm sew. pipe - 73'
5' depth
Const. sloped end
Const. riprap basin
(For details, see sht. GJ-22)
- ⑧ Sta. "SR2" 582+01.85, 34.1' Rt.
Const. type "G-2" inlet
Inst. 12" storm sew. pipe - 101'
5' depth
- ⑨ Sta. "SR2" 583+02.53, 34.1' Rt.
Const. type "G-2" inlet
Inst. 12" storm sew. pipe - 117'
5' depth
- ⑩ Sta. 584+19.13, 34.1' Rt.
Const. manhole, with type "G-2" inlet
Inst. 12" storm sew. pipe - 113'
10' depth
- ⑪ Sta. "SR2" 585+31.26, 34.1' Rt.
Const. manhole, with type "G-2" inlet
Inst. 12" storm sewer pipe - 67'
10' depth
- ⑫ Sta. "SR2" 586+84.92, 34.1' Rt.
Const. type "G-2" inlet
Inst. 12" storm sew. pipe - 88'
5' depth
- ⑬ Sta. "SR2" 585+97.65, 28.4' Rt.
Const. storm manhole
Inst. 12" storm sew. pipe - 82'
10' depth
Const. sloped end
Const. riprap basin
(For details, see sht. GJ-22)
- ⑭ Sta. "SR2" 585+09.55, 98.5' Lt. to
Sta. "SR2" 585+68.75, 92.3' Lt.
Inst. 24" storm sew. pipe - 80'
5' depth
Const. sloped end - 2
Const. paved end slope, Lt.
Const. riprap basin
(For details, see sht. GJ-22)
- ⑮ Sta. "SR2" 585+70.30, 75.54' Lt.
Const. type "D" inlet, mod.
Inst. 24" storm sew. pipe - 25'
5' depth
(For details, see sht. GJ-22)
- ⑯ Sta. "SR2" 585+36.39, 158.7' Lt.
Const. storm manhole 72" dia.
Inst. 24" storm sew. pipe - 103'
5' depth
- ⑰ Sta. "SR2" 585+52.50, 57.2' Lt.
Const. storm manhole 108" dia.
Inst. 36" storm sew. pipe - 173'
20' depth
(For details, see sht. GJ-13D)
- ⑱ Sta. "SR2" 590+63.44, 132.63' Rt.
Const. type "D" inlet
Inst. 12" storm sew. pipe - 350'
5' depth
- ⑲ Sta. "SR2" 587+19.16, 119.3' Rt.
Const. storm manhole
Inst. 12" storm sew. pipe - 153'
5' depth
- ⑳ Sta. "SR2" 585+70.29, 123.3' Rt.
Const. storm manhole 72" dia.
- ㉑ See sht. GJ-3, note 2
Const. storm manhole 72" dia.
Inst. 36" storm sew. pipe
- ㉒ See sht. GJ-3, note 3
Const. storm manhole 72" dia.
Inst. 36" storm sew. pipe
- ㉓ Sta. "SR2" 585+68.75, Lt. to
Sta. "SR2" 597+55.40, Lt.
Const. ditch
2' flat bottom, 1:4 and 1:2 slopes
- ㉔ Const. bio-retention pond, D00678 (SWM10)
Inst. facility field markers, type S1 - 2
Inst. facility field markers, type S2
Conc. pipe anchors
Aggregate base - 890 tons
6" gate valve
(For details, see shts. GJ-13 & GJ-13A)
- ㉕ Sta. "SR2" 588+79.55, 34.1' Rt.
Const. type "G-2" inlet
Inst. 12" storm sew. pipe - 89'
5' depth
Const. sloped end
Const. riprap basin
(For details, see sht. GJ-22)
- ㉖ Sta. "SR2" 590+72.90, 34.1' Rt.
Const. type "G-2" inlet
Inst. 12" storm sew. pipe - 89'
5' depth
Const. sloped end
Const. riprap basin
(For details, see sht. GJ-22)
- ㉗ Sta. "SR2" 579+95.74, 52.44' Lt. to
Sta. "SR2" 581+19.4, 43.08' Lt.
Inst. 18" culv. pipe - 124'
10' depth
- ㉘ Sta. "SR2" 577+78, 42' Lt. to
Sta. "SR2" 578+71, 120' Rt.
Const. conc. cap over extg. 8" storm sew. pipe
(See drg. no. RD306)
- ㉙ See sht. GJ-3, note 1
Inst. 36" storm sew. pipe
- ㉚ See sht. 8D, note 25
Const. ditch
- ㉛ Sta. "SR2" 592+64.69, 34.1' Rt.
Const. type "G-2" inlet
Inst. 12" storm sew. pipe - 90'
5' depth
Const. sloped end
Const. riprap basin
(For details, see sht. GJ-22)
- ㉜ Remove abandoned telephone &
electrical lines & poles

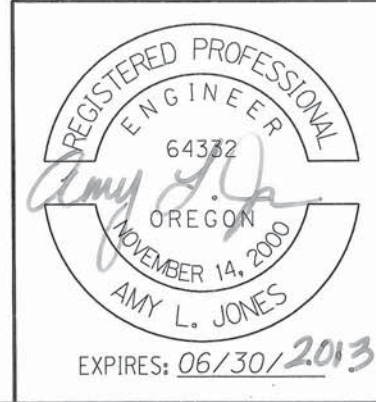


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CLACKAMAS HWY. CLACKAMAS COUNTY	
Design Team Leader - Tom Metcalf Designed By - Ben Wewerka/Amy Jones Drafted By - Serban Dinca/Brittney Zornado	
DRAINAGE & UTILITIES NOTES	SHEET NO. 9D



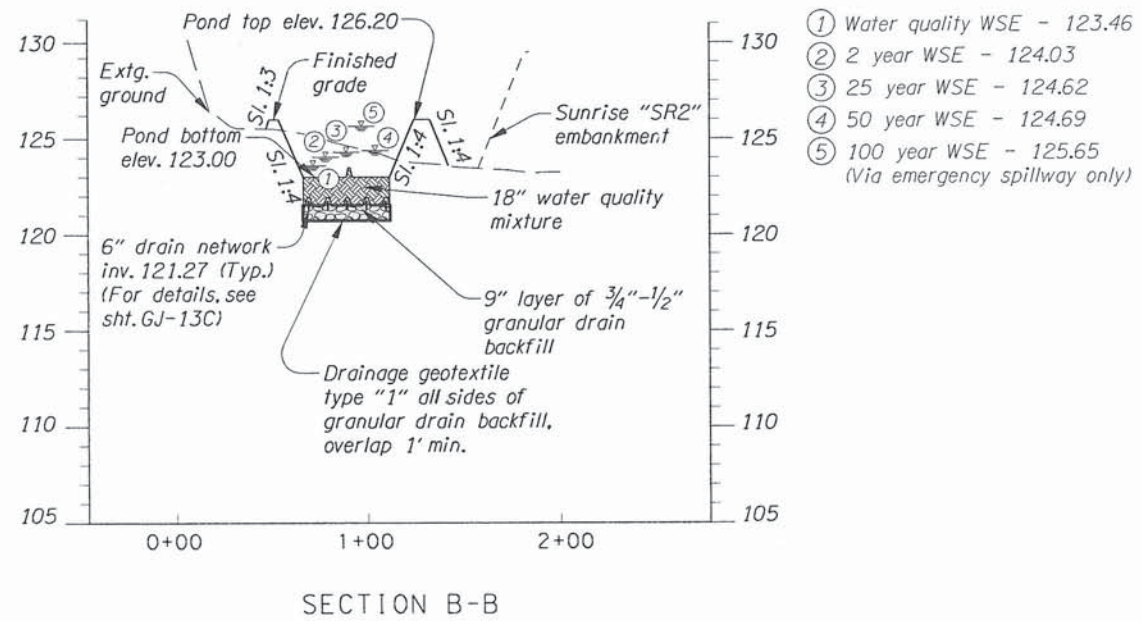
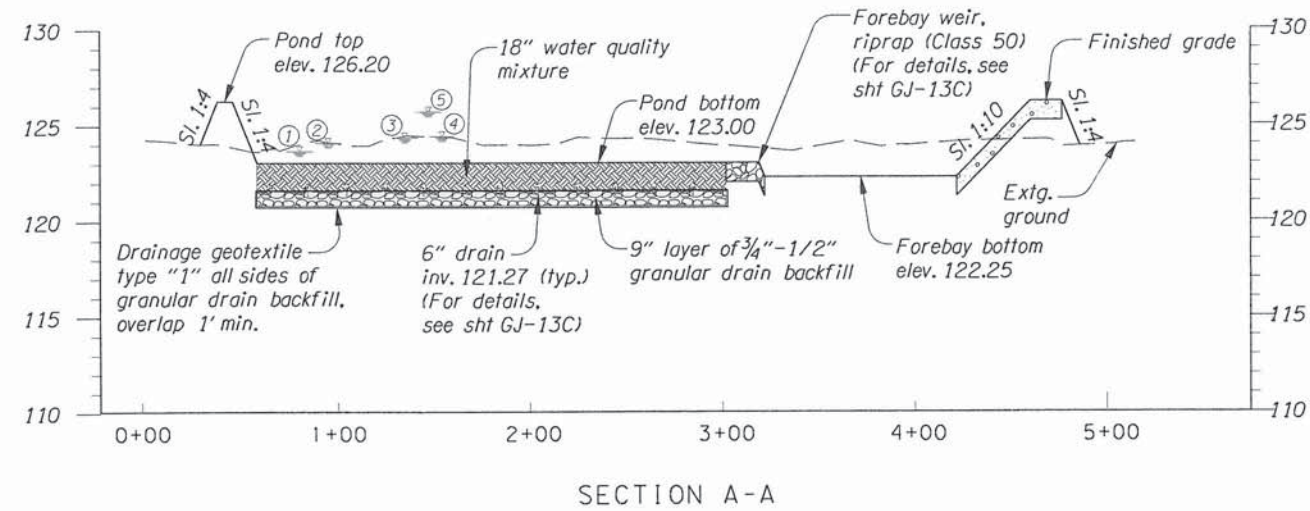
**D00678
Detention Pond
SWM10**

"SWM10" PLAN
BIORETENTION POND, DF1-D00678



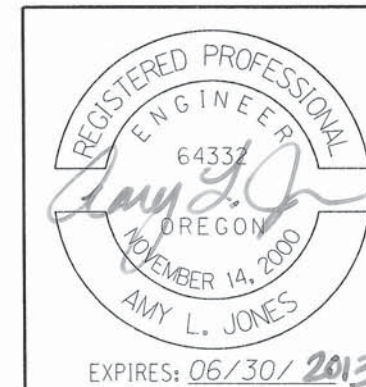
LEGEND	
	No work area

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<p>Design Team Leader - Tom Metcalf Designed By - Ben Wewerka/Amy Jones Drafted By - Serban Dinca/Brittney Zornado</p>	
<p>STORMWATER DETAILS</p>	<p>SHEET NO. GJ-13</p>

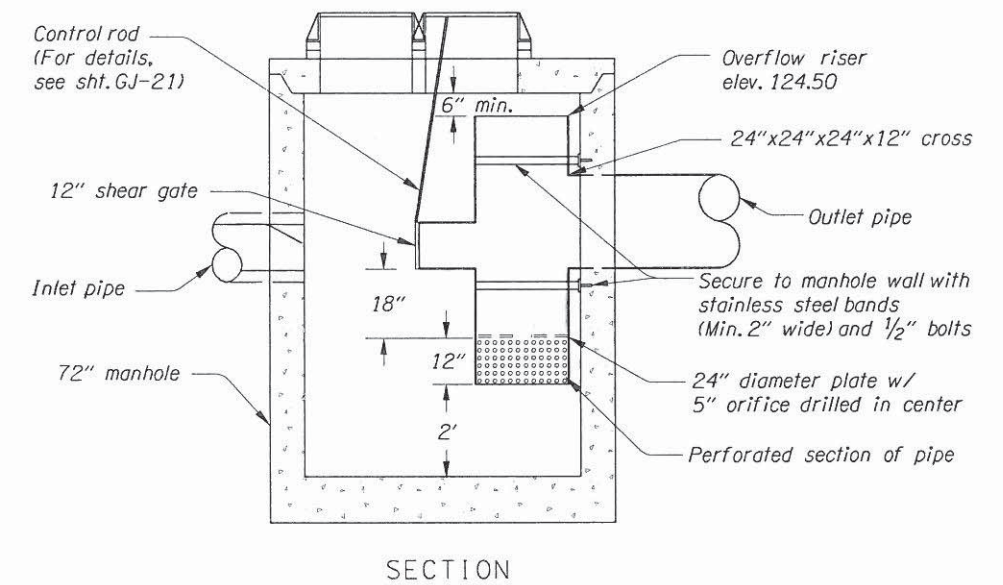
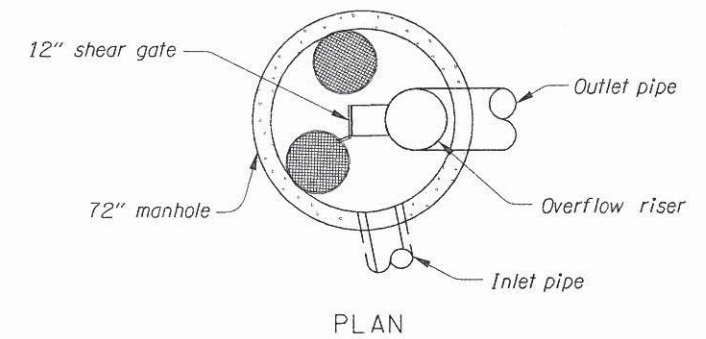
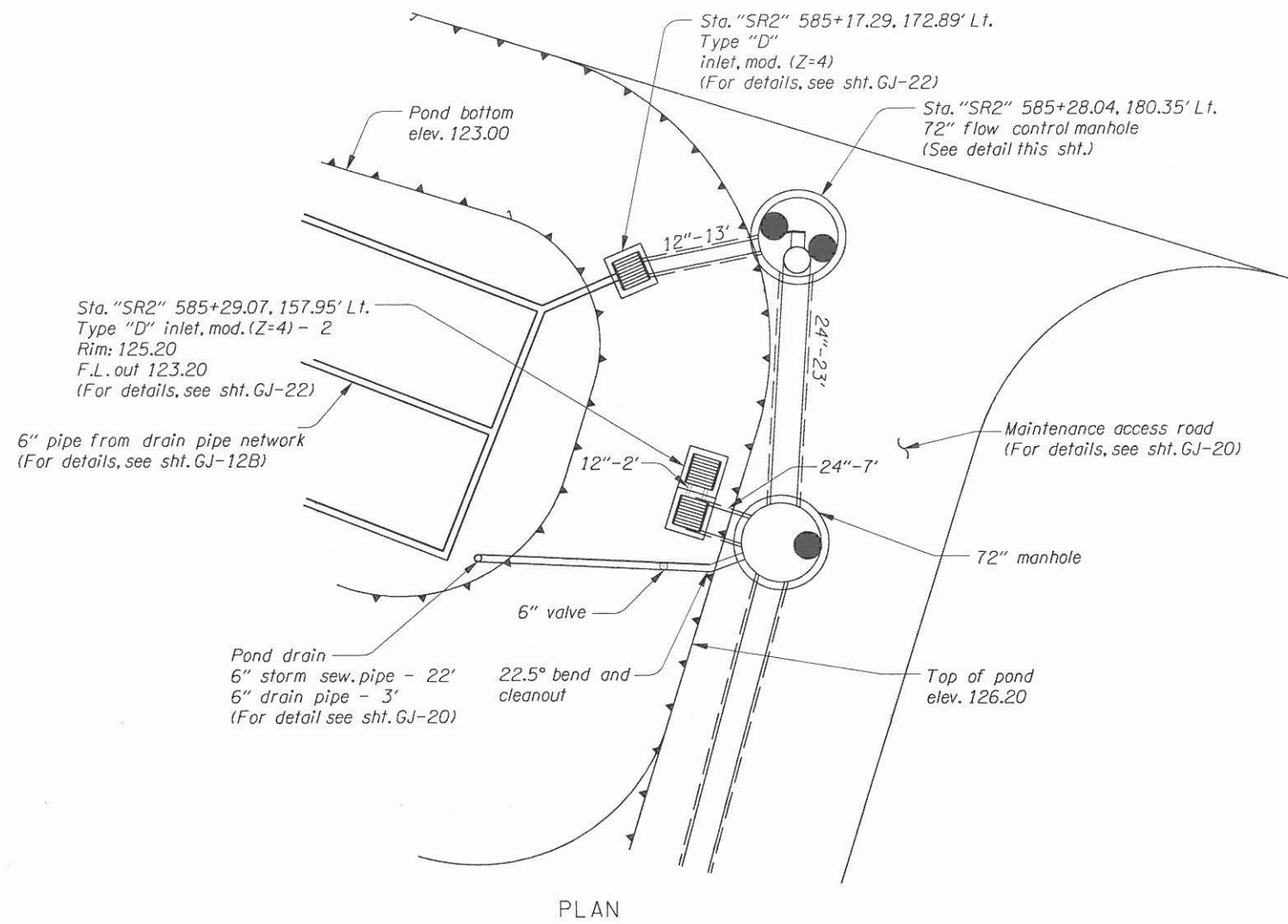


- ① Water quality WSE - 123.46
- ② 2 year WSE - 124.03
- ③ 25 year WSE - 124.62
- ④ 50 year WSE - 124.69
- ⑤ 100 year WSE - 125.65
(Via emergency spillway only)

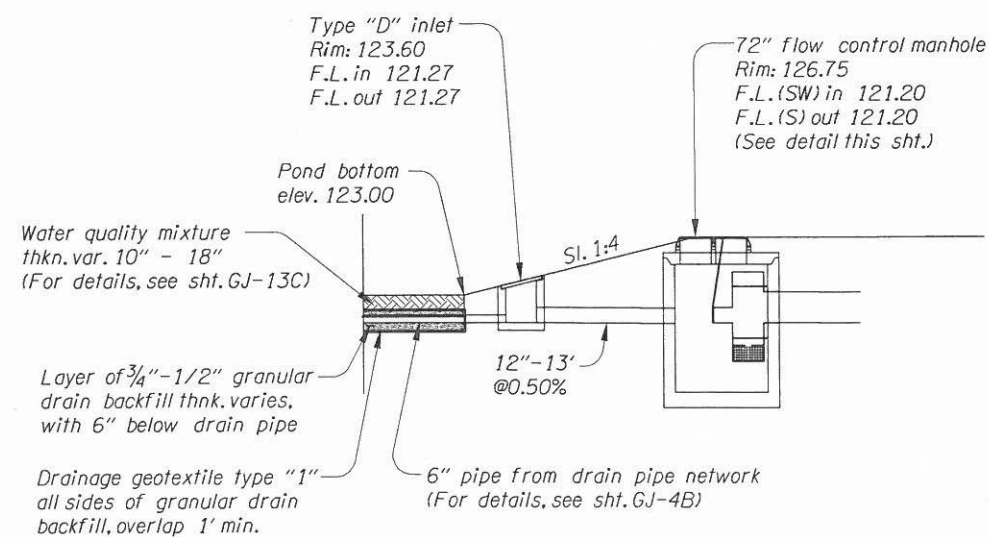
"SWM10" SECTIONS
DFI-D00678



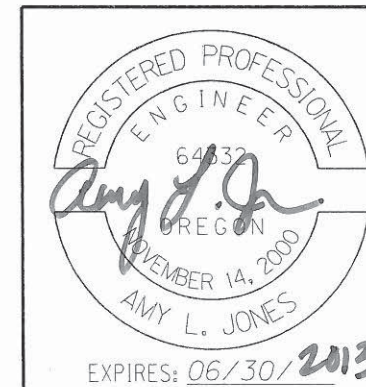
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CONSULTING ENGINEERS <small>www.obec.com</small>	
<small>CORPORATE OFFICE: 920 COUNTRY CLUB ROAD, SUITE 100B EUGENE, OREGON 97401-6089 REGIONAL OFFICES: LAKE OSWEGO, SALEM, MEDFORD, OREGON, VANCOUVER, WASHINGTON</small>	
FFO - OR212/224: SUNRISE CORRIDOR (I-205 - SE 122ND AVE) SEC. CLACKAMAS HWY. CLACKAMAS COUNTY	
Design Team Leader - Tom Metcalf Designed By - Ben Wewerka/Amy Jones Drafted By - Serban Dinca/Brittney Zornado	
STORMWATER DETAILS	SHEET NO. GJ-13A



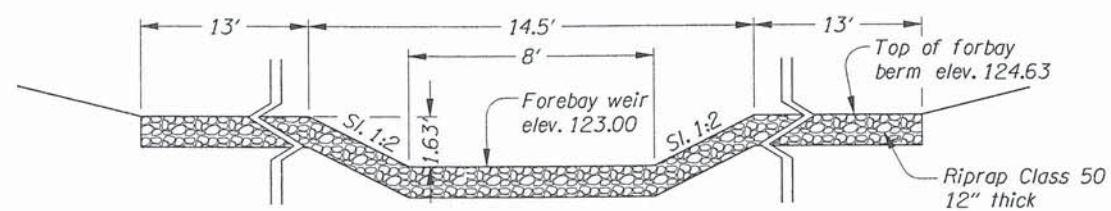
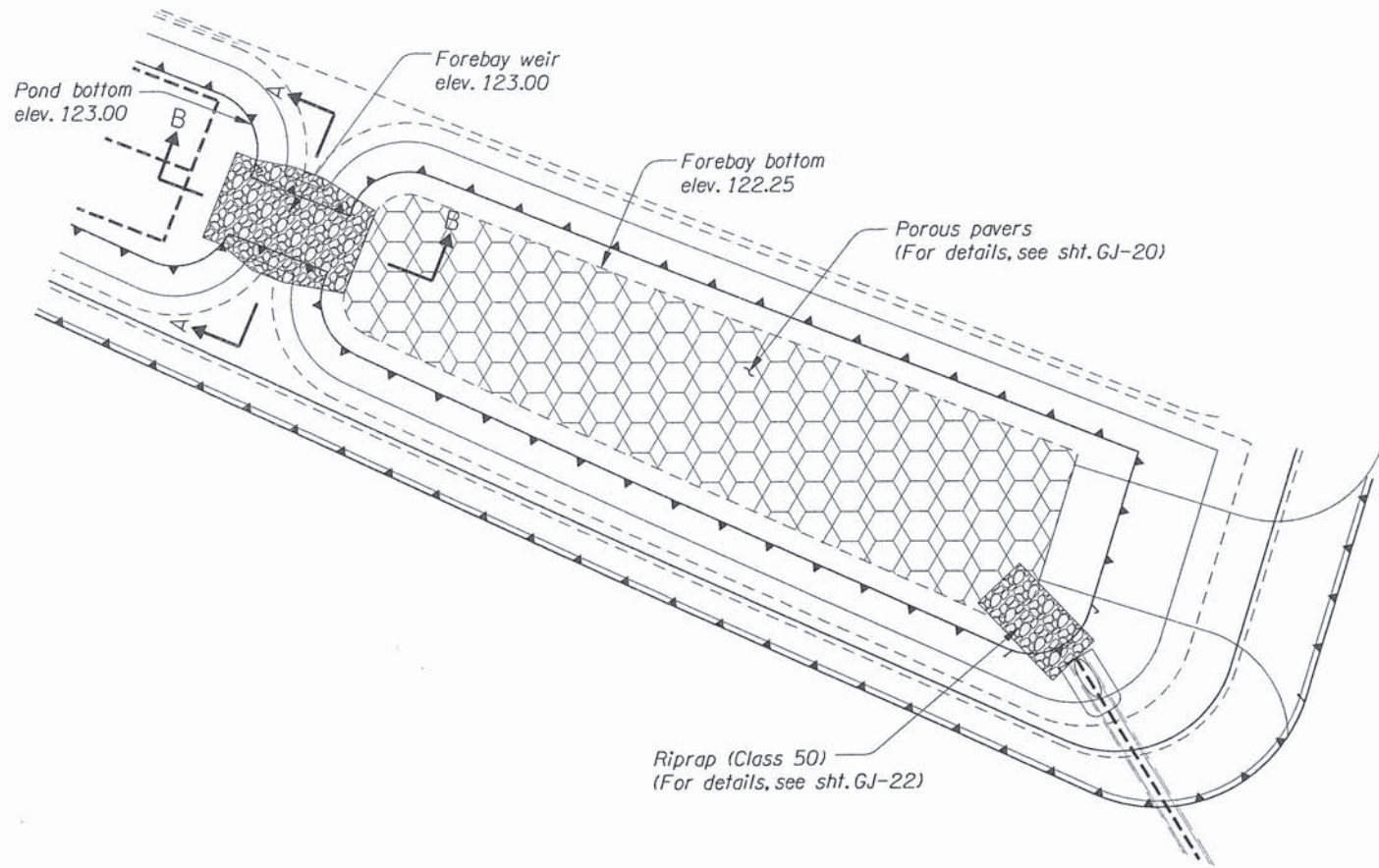
FLOW CONTROL MANHOLE



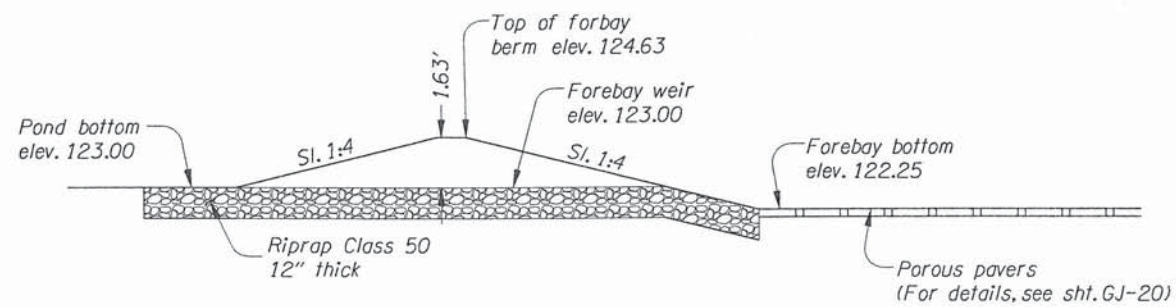
"SWM10" OUTFALL STRUCTURE DETAIL
DF I - D00678



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<p>OBEC CONSULTING ENGINEERS www.obec.com</p>	<p><small>CORPORATE OFFICE: 920 COUNTRY CLUB ROAD, SUITE 100B EUGENE, OREGON 97401-6089 REGIONAL OFFICES: LAKE OSWEGO; SALEM; MEDFORD, OREGON; VANCOUVER, WASHINGTON</small></p>
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<p>Design Team Leader - Tom Metcalf Designed By - Ben Wewerka/Amy Jones Drafted By - Serban Dinca/Brittney Zornado</p>	
<p>STORMWATER DETAILS</p>	
<p>SHEET NO. GJ-13B</p>	

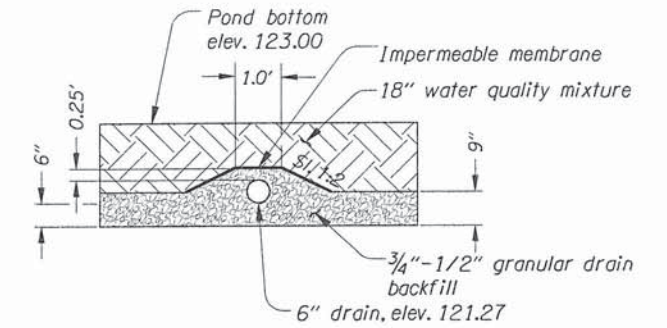


SECTION A-A

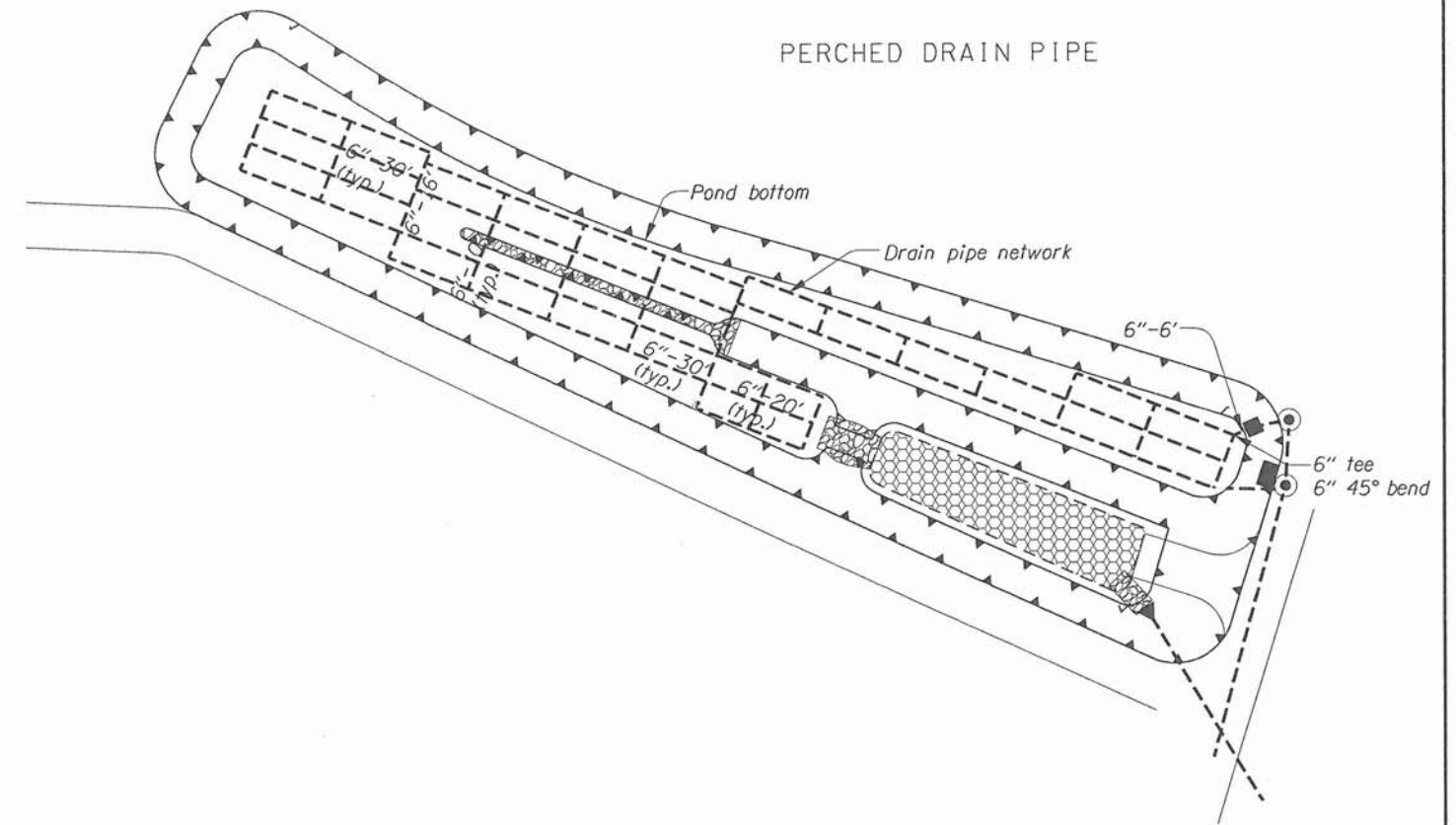


SECTION B-B

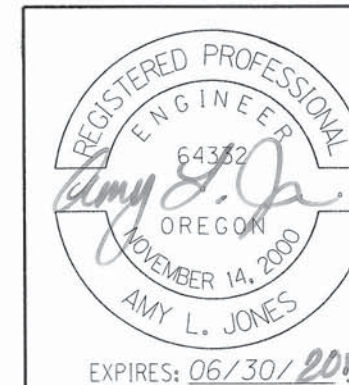
"SWM10" FOREBAY DETAIL
DFI-D00678



PERCHED DRAIN PIPE



"SWM10" DRAIN PIPE NETWORK DETAIL
DFI-D00678



OREGON DEPARTMENT OF TRANSPORTATION

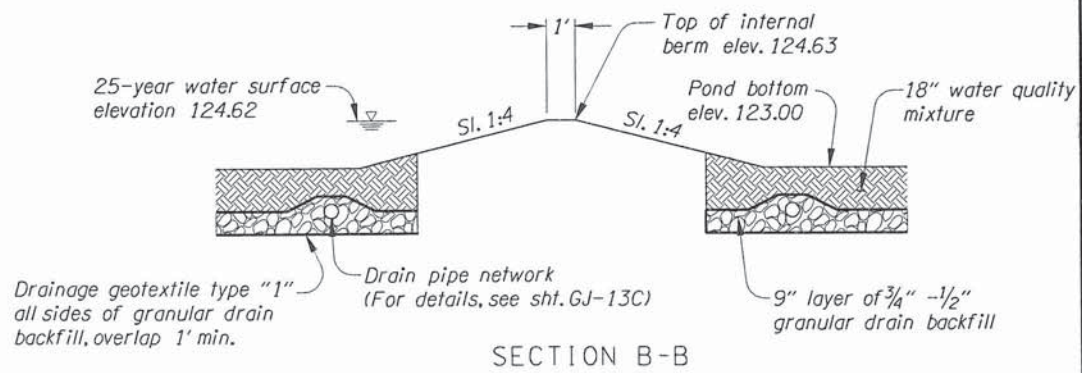
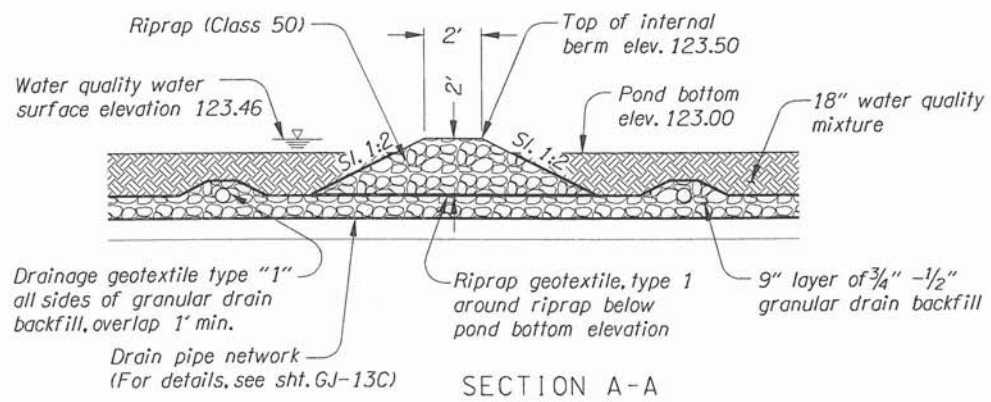
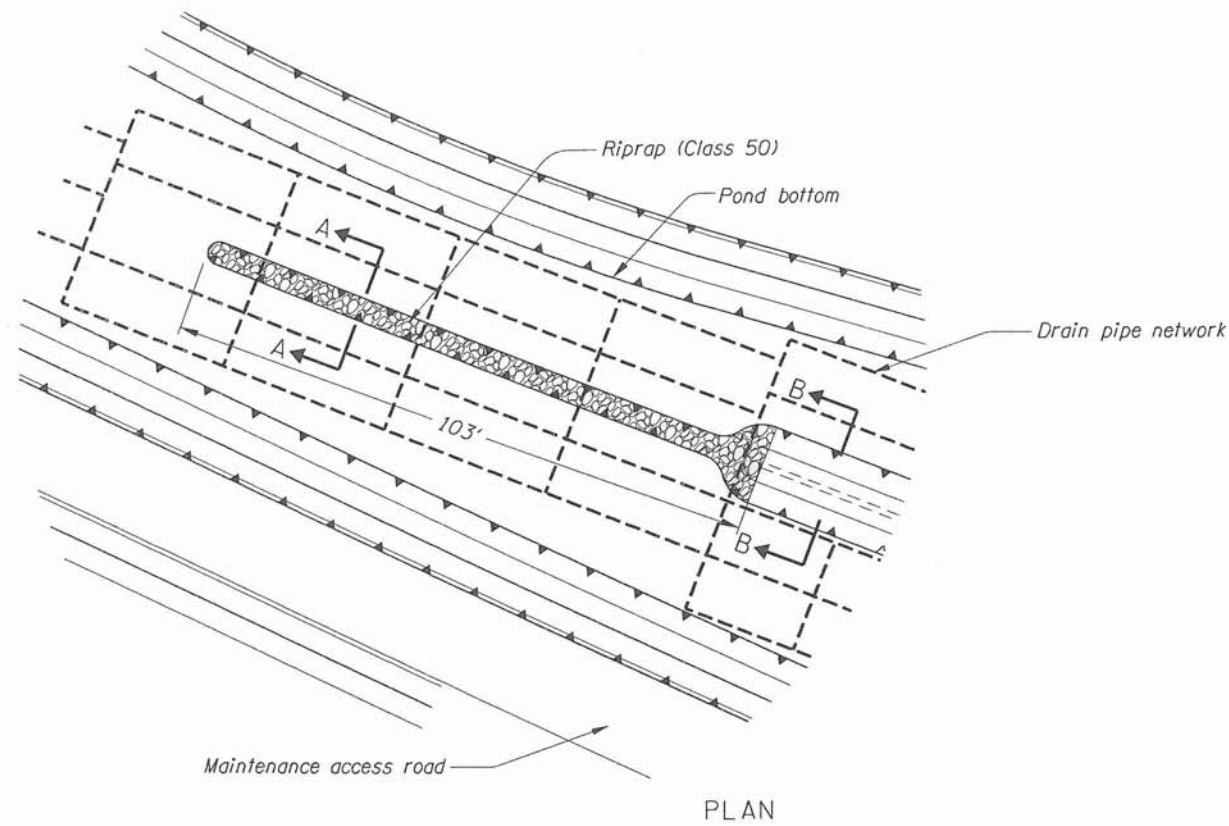
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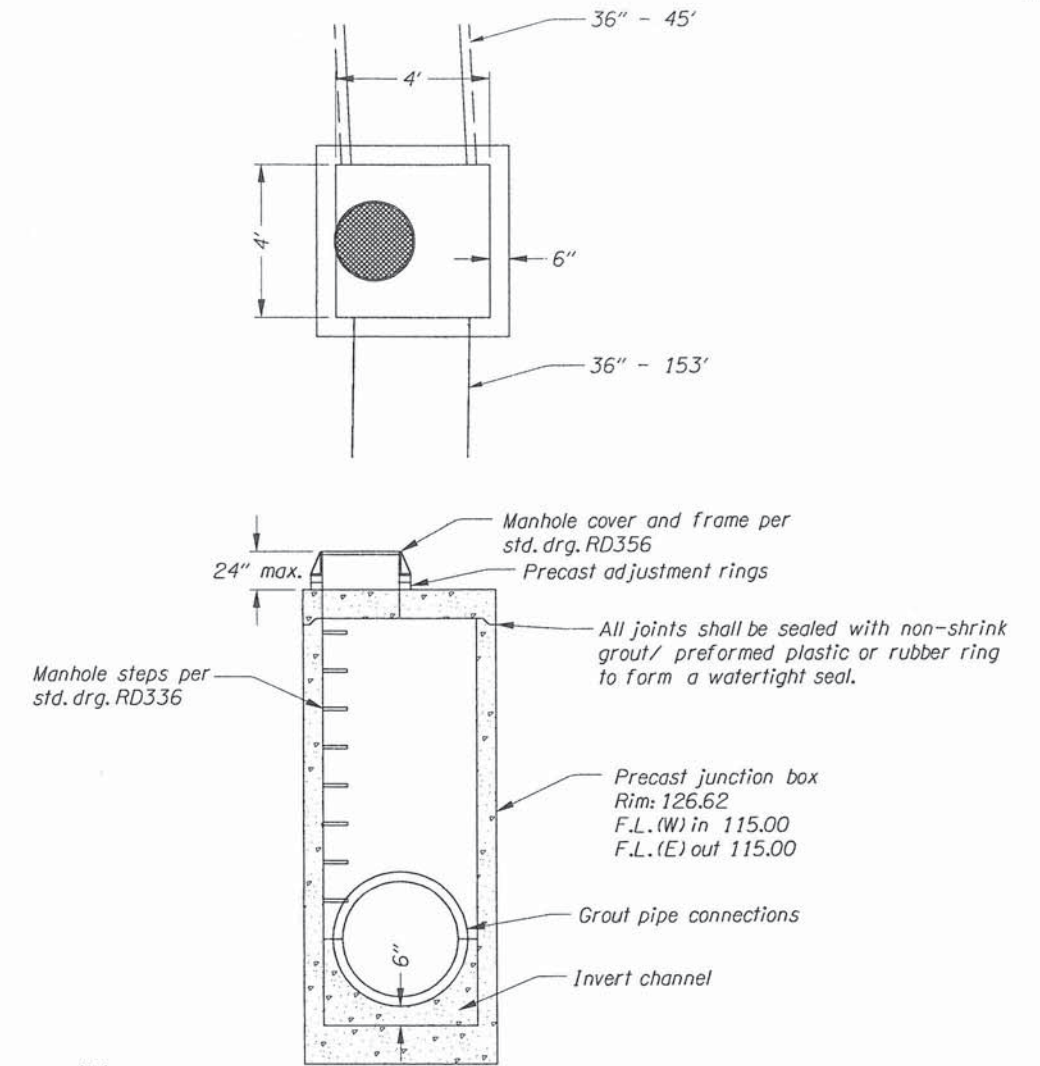
Design Team Leader - Tom Metcalf
Designed By - Ben Wewerka/Amy Jones
Drafted By - Sarban Dinco/Brittney Zornado

STORMWATER DETAILS

SHEET NO.
GJ-13C



"SWM10" INTERNAL BERM
DF I - D00678



Notes:

1. All precast sections shall conform to the requirements of ASTM C478.
2. Structure shall support a H-20 loading per AASHTO HS-20-44.
3. Contractor shall submit shop drawings to engineer for approval.

JUNCTION BOX



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FFO - OR212/224: SUNRISE CORRIDOR (I-205 - SE 122ND AVE) SEC. CLACKAMAS HWY. CLACKAMAS COUNTY	
Design Team Leader - Tom Metcalf Designed By - Ben Wewerka/Amy Jones Drafted By - Serban Dinca/Brittney Zornado	
STORMWATER DETAILS	SHEET NO. GJ-13D