OPERATION & MAINTENANCE MANUAL

DFI No. : D00667

Facility Type: Bio-Retention Pond

[April, 2018]

INDEX

1. Identification

Drainage Facility ID (DFI):	**D00667**
Facility Type:	Bio-Retention Pond
Construction Drawings:	(V-File Number) 46V-022
Location:	District: 2B
	Highway No.: 68
	Mile Post: (10.0 to 10.07) Hwy 68
	Description: This facility is located south of the Sunrise Corridor, west of OR 213 (Cascade Highway North) southbound on ramp and east of OR 213.

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 south of the Sunrise Corridor, west of OR 213 (Cascade Highway North) southbound on ramp and east of OR 213. Access to the facility is provided with two maintenance access roads connecting to the ramp shoulder, and directly from the ramp shoulder.

There are two 12-inch culverts that convey stormwater runoff from paved areas along OR 213 into the detention pond. The location of these are noted on the Operation Plan as points A, and B in Appendix A

Runoff exits the pond by way of a Type “D” inlet and 12-inch storm drain pipe that connects to a manhole containing the flow control assembly. See Photos 1 and 2 and Points C and D on the Operational Plan in Appendix A.

The storm drain outlet pipe from the flow control manhole connects to the downstream pipe system. These are shown in the Operational Plan in Appendix A. The receiving waterway for the outlet pipes is Dean Creek.

A. Maintenance equipment access:
   The pond and outlet structures can be accessed from the ramp shoulder and from a maintenance access road connecting to the ramp shoulder. See the 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

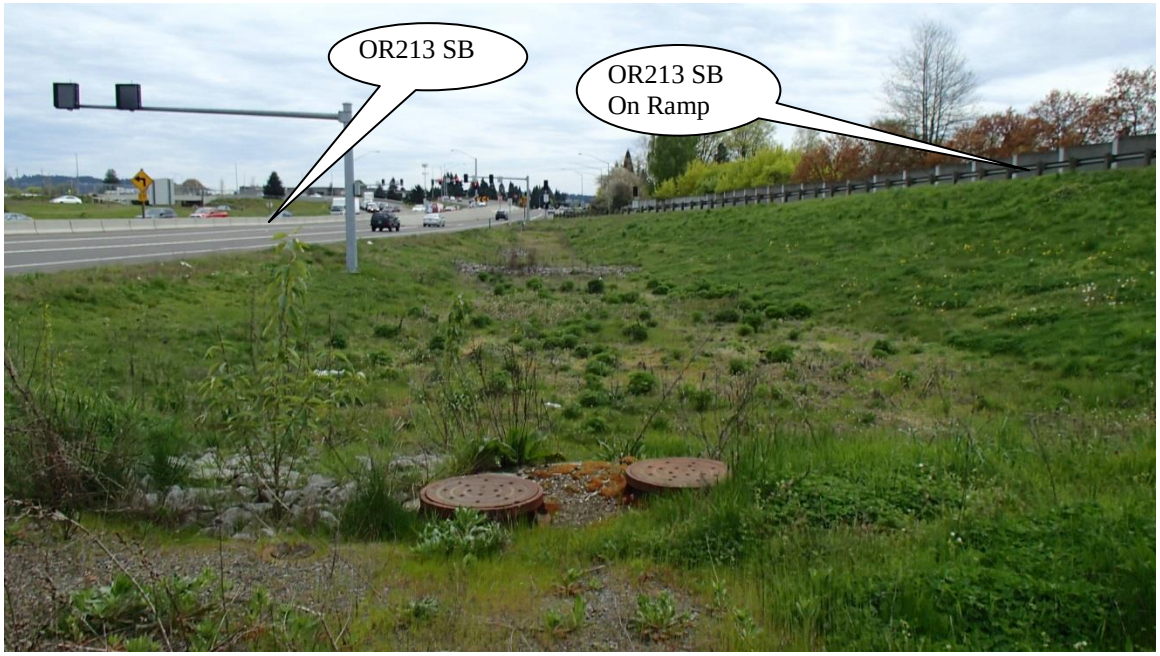


Photo 1: a view of storm drain and flow control manholes, looking South along OR213.

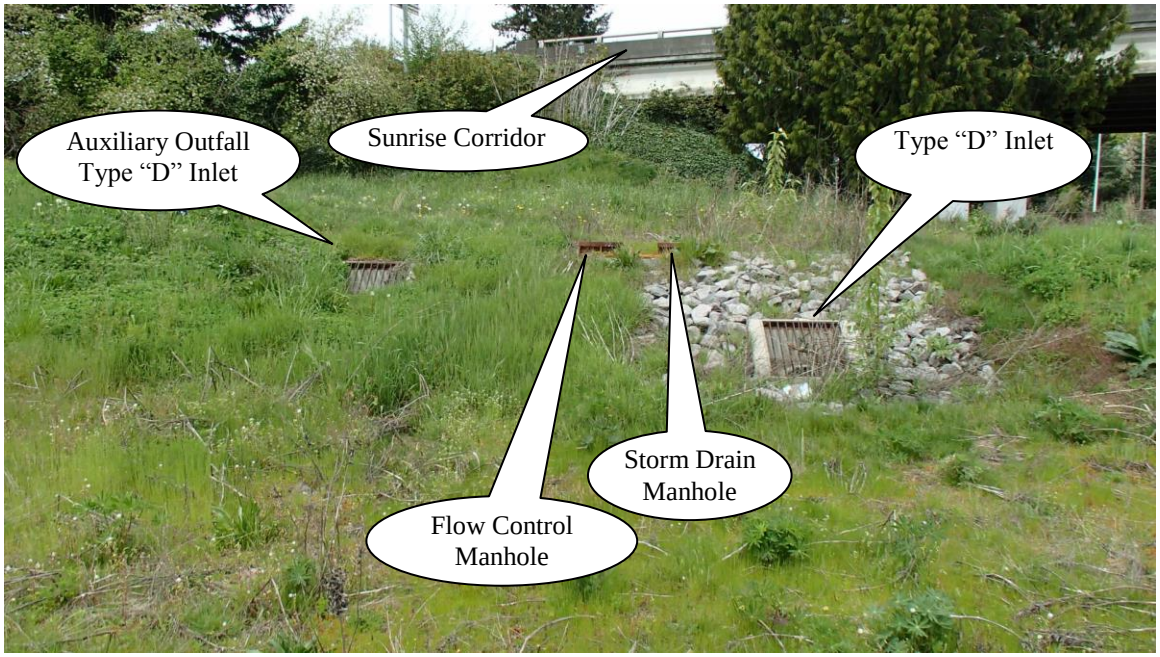


Photo 2: a view of bio-retention pond, looking North toward Sunrise corridor.

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

on the south side of the pond. This is noted as point B 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.

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 a "D" inlet and a 12-inch outfall pipe. This connects to a manhole downstream of the flow control manhole noted as Point D on the Operation Plan. See Photos 1 and 2 and Points E and F in the Operational Plan in Appendix A.

☒ Other, as noted below

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

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

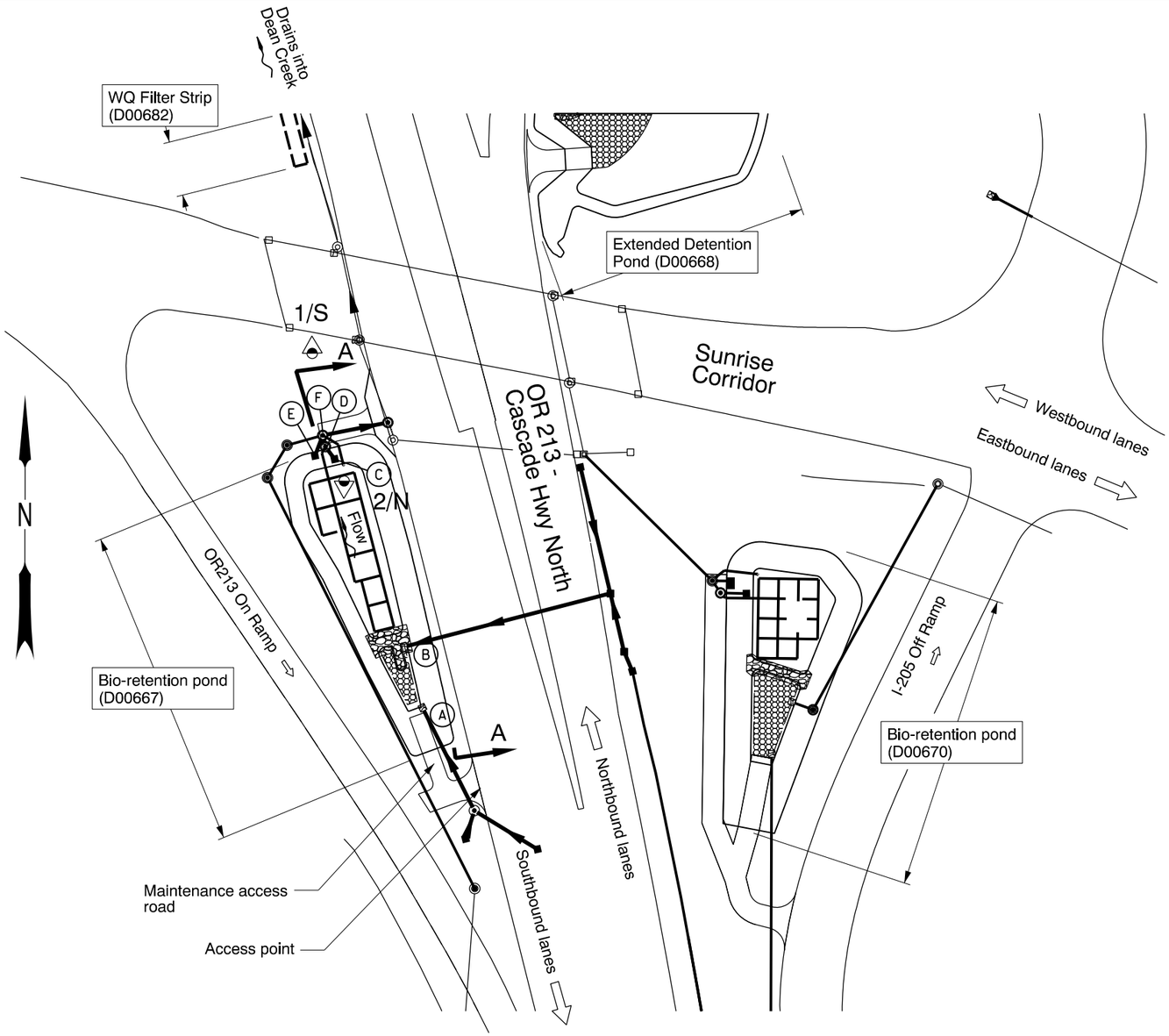
Appendix A

Content:

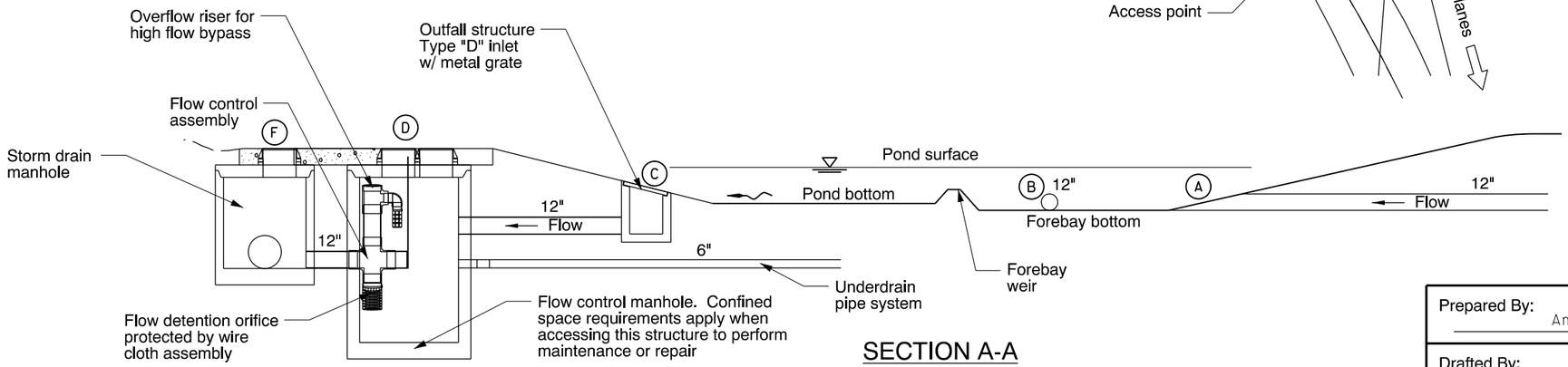
- **Operational Plan and Profile Drawing**

LEGEND:

- Photo Location / Direction
- (A) 12" storm drain pipe outlet
- (B) 12" storm drain pipe outlet
- (C) Type"D" Inlet and 12" storm drain pipe outfall
- (D) Flow control manhole
- (E) Auxiliary outfall - Type"D" Inlet and 12" storm drain pipe outfall
- (F) Storm drain manhole
- Manhole (and/or)
- Inlet (and/or)
- 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

Prepared By: Amy Jones

Drafted By: Amy Jones

DFI D00667
MAINTENANCE DISTRICT 2B HWY 68
BIO-RETENTION POND
CASCADE HWY NORTH MP 10.0 TO 10.07
CLACKAMAS COUNTY

Appendix B

Content:

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

46V-022

STATE OF OREGON

DEPARTMENT OF TRANSPORTATION

PLANS FOR PROPOSED PROJECT

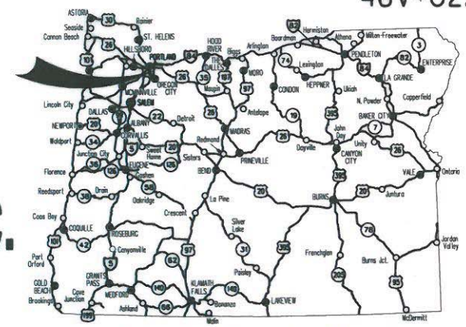
GRADING, DRAINAGE, STRUCTURES, PAVING, SIGNING, ILLUMINATION, SIGNALS & ROADSIDE DEVELOPMENT

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

CLACKAMAS HWY.

CLACKAMAS COUNTY
MARCH 2013

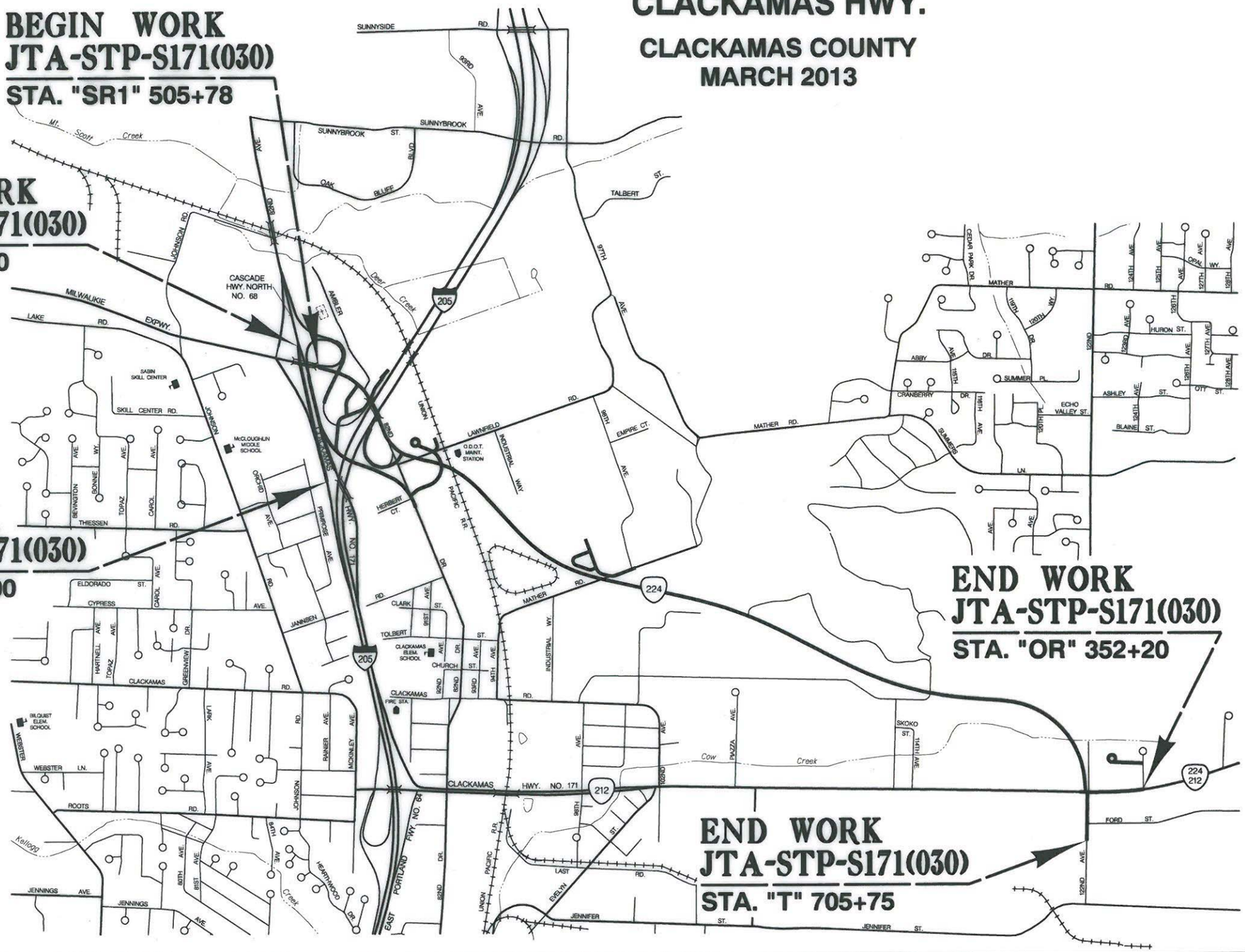
INDEX OF SHEETS	
SHEET NO.	DESCRIPTION
1	Title Sheet
1A	Index Of Sheets Cont'd.



Overall Length Of Project - 3.90 Miles

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

N

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

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 Baney	COMMISSIONER
Matthew L. Garrett	DIRECTOR OF TRANSPORTATION

PLANS PREPAIRED FOR
OREGON DEPARTMENT OF TRANSPORTATION

OBEC CONSULTING ENGINEERS
www.obec.com
CORPORATE OFFICE:
920 COUNTRY CLUB ROAD, SUITE 100B EUGENE, OREGON 97401-8089
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: _____ 12/31/12
Signature & date

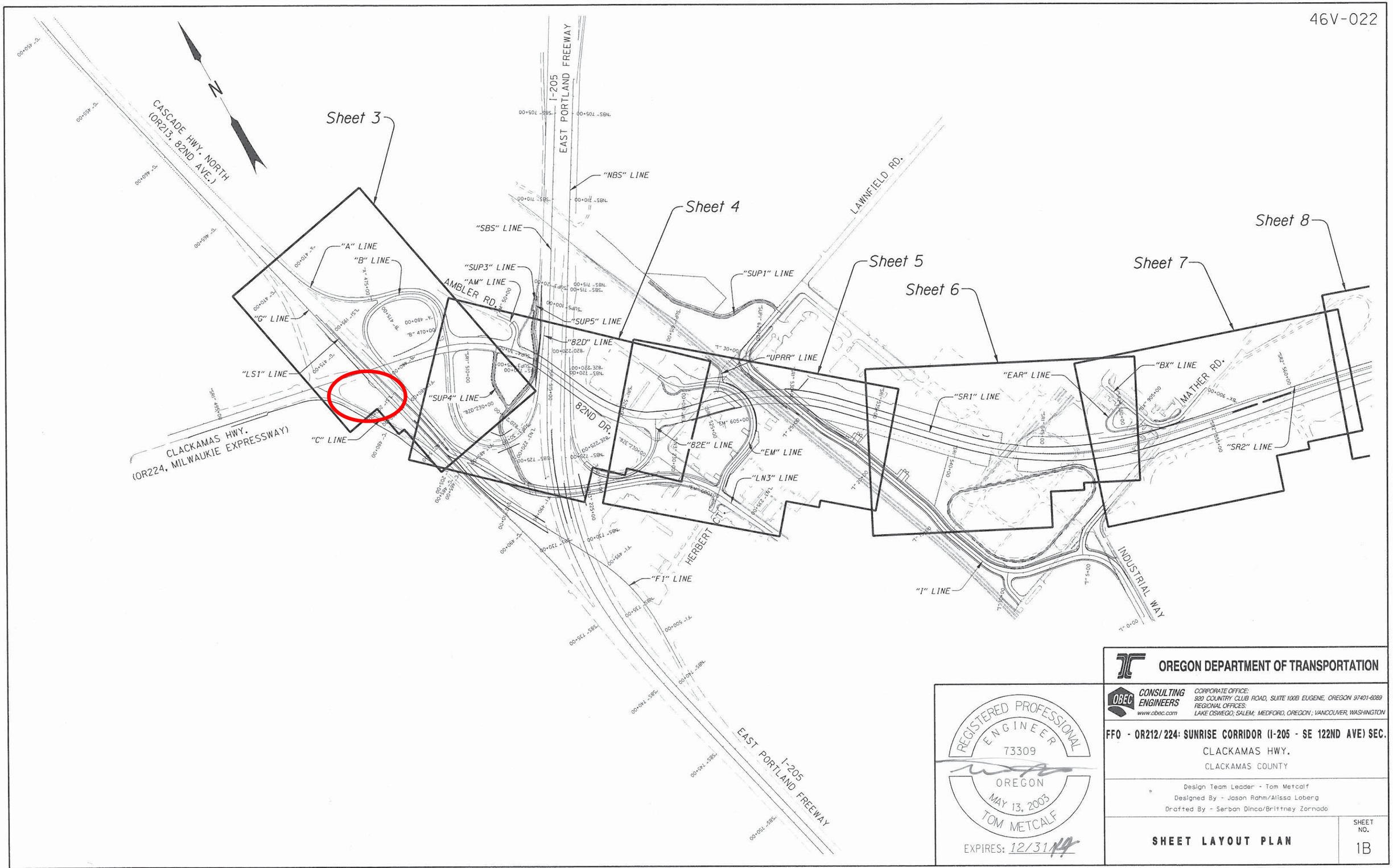
LAWRENCE H. FOX - PROJECT MANAGER
Print name and title

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

File No.



OREGON DEPARTMENT OF TRANSPORTATION

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www.obec.com

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920 COUNTRY CLUB ROAD, SUITE 100B EUGENE, OREGON 97401-6089
REGIONAL OFFICES:
LAKE OSWEGO; SALEM; MEDFORD, OREGON; VANCOUVER, WASHINGTON

REGISTERED PROFESSIONAL ENGINEER
73309
OREGON
MAY 13, 2003
TOM METCALF
EXPIRES: 12/31/14

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

CLACKAMAS HWY.

CLACKAMAS COUNTY

Design Team Leader - Tom Metcalf
Designed By - Jason Rahm/Alissa Loberg
Drafted By - Serban Dinca/Brittney Zornado

SHEET LAYOUT PLAN

SHEET NO. 1B

File No.

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Sec. 4, T. 2 S., R. 2 E., W.M.

46V-022

DFI D00668
Extended
detention pond
SWM02

DFI D00670
Bio-retention pond
SWM03

DFI D00669
Biofiltration Swale
SWM02a

DFI D00682
Filter Strip
SWM01a

DFI D00667
Bio-retention pond
SWM01

"A" 480+00

"SR1" 510+00

"B" 470+00

"B" 475+00

"F1" 475+00

"A" 475+00

"A" 470+00

"B" 480+00

"F1" 480+00

"S1" 195+00

"G" 475+00

"G" 470+00

"82D" 230+00

"A" LINE

"B" LINE

"SR1" LINE

"LS1" LINE

"G" LINE

"F1" LINE

"82D" LINE

CLACKAMAS HWY. "B" (OR224, MILWAUKIE EXPRESSWAY)

CASCADE HWY. NORTH (OR213, 82ND AVE.)

SEE SHEET 4D MATCH LINE

SEE SHEET 4D MATCH LINE

SEE SHEET 15D MATCH LINE

12" - 16'

12" - 33'

12" - 60'

12" - 113'

18"-194'

12"-136'

18"-15'

12"-45'

12"-98'

18"-320'

12"-16'

12"-158'

12"-84'

24"-50'

24"-28'

24"-29'

24"-346'

LEGEND

Porous pavers in pond

OREGON DEPARTMENT OF TRANSPORTATION

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

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. 3D

File No.

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(1) Remove pipe - 590'

(2) Abandon pipe

(3) Remove inlet - 6

(4) Remove manhole - 2

(5) Minor adjust manhole - 3
(See drg. no. RD360)

(6) Sta. "A" 472+66.6, Lt.
Const. type "D" inlet
Inst. 12" storm sew. pipe - 16'
5' depth
Connect to extg. inlet
(See drg. nos. RD300, RD326, RD370, RD380 & RD386)

(7) Const. water quality swale, D00669 (SWM02a)
Inst. facility field markers, type S1 - 2
Inst. facility field marker, type S2
(For details, see sht. GJ-5B)
(See drg. no. RD399)

(8) Sta. "A" 474+49.5, Lt.
Const. modified curb opening
(For details, see sheet 2B-14)

(9) Sta. "F1" 474+50.64, 44.18' Lt.
Const. storm manhole over extg. storm sew. pipe
(See drg. nos. RD335, RD336, RD344 & RD356)

(10) Sta. "F1" 475+32.86, 33.40' Lt.
Const. type "G-2M" inlet
Inst. 12" storm sew. pipe - 113'
10' depth
Tunneling, boring & jacking
(See drg. nos. RD308 & RD364)

(11) Sta. "B" 477+24.04, 27.08' Lt.
Inst. 12" storm sew. pipe - 60'
5' depth
(See drg. no. RD302)

(12) Const. storage pond, D00668 (SWM02)
Inst. facility field markers, type S1 - 2
Inst. facility field marker, type S2
Aggregate base - 65 tons
(For details, see sht. GJ-5)

(13) Sta. "G" 481+44.11, 43.83' Rt. to
Sta. "G" 478+06.33, 119.98' Rt.
Inst. 24" storm sew. pipe - 346'
10' depth

(14) Sta. "G" 478+06.33, 119.98' Rt.
Const. storm manhole 60" dia.
Inst. 24" storm sew. pipe - 29'
10'depth
(See drg. no. RD346)

(15) Sta. "G" 477+86.16, 99.75' Rt.
Const. storm manhole 60" dia.
Inst. 24" storm sew. pipe - 28'
10' depth

(16) Sta. "G" 477+85.48, 71.88' Rt.
Const. storm manhole 72" dia.
Inst. 24" storm sew. pipe - 50'
10' depth

(17) Sta. "G" 477+88.02, 22' Rt.
Const. storm manhole 72" dia.
over extg. storm sew. pipe

(18) Sta. "G" 480+87.09, 29.88' Rt. to Sta. "G" 480+04.97, 48.42' Rt.
Inst. 12" storm sew. pipe - 84'
5' depth
Const. sloped end
Const. riprap basin
(For details, see sht. GJ-22)
(For profile, see sht. 15F)
(See drg. nos. RD318 & RD316)

(19) Const. bio-retention pond, D00667 (SWM01)
Inst. facility field markers, type S1 - 2
Inst. facility field marker, type S2
Conc. pipe anchor
Aggregate base - 150 tons
6" gate valve
(For details, see shts. GJ-4, GJ-4A, GJ-4B & GJ-21)

(20) Sta. "F1" 479+91.16, 36.14' Lt.
Const. type "G-2" inlet
Inst. 12" storm sew. pipe - 45'
5' depth

(21) Sta. "F1" 480+06.94, 39.09' Lt.
Const. type "D" inlet
Inst. 12" storm sew. pipe - 16'
5' depth

(22) Sta. "F1" 479+54.26, 112.66' Lt.
Const. storm manhole 60" dia.
Inst. 12" storm sew. pipe - 136'
5' depth

(23) Const. bio-retention pond, D00670 (SWM03)
Inst. facility field markers, type S1 - 2
Inst. facility field marker, type S2
Conc. pipe anchor
Aggregate base - 425 tons
6" gate valve
(For details, see shts. GJ-6 & GJ-6A)

(24) Sta. "82D" 231+56.63, 60.5' Lt. to Sta. "82D" 233+49.63, 50.3' Lt.
Inst. 18" storm sew. pipe - 194'
10' depth
Connect to extg. manhole
(For profile, see sht. 4F-2)

(25) Sta. "82D" 231+56.63, 60.5'
Const. storm manhole 60" dia.
Inst. 18" storm sew. pipe - 15'
5' depth
Const. sloped end
Const. paved end slope, Rt.
Const. riprap basin
(For detail, see sht. GJ-22)
(For profile, see sht. 4F-2)
(See drg. no. RD320)

(26) Sta. "82D" 228+38.20, 57.3' Lt. to Sta. "82D" 231+14.08, 74.41' Lt.
Inst. 18" storm sew. pipe - 320'
10' depth
Const. sloped end
Const. riprap basin
(For detail, see sht. GJ-22)
(For profile, see sht. 4F-2)

(27) Sta. "F1" 478+49.52, 35.94', Lt.
Const. type "G-2" inlet
Inst. 12" storm sew. pipe - 98'
5' depth

(28) Sta. "F1" 479+46.43, 35.8' Lt.
Const. type "G-2" inlet
Inst. 12" storm sew. pipe - 158'
10' depth
Const. sloped end
Const. paved end slope, Rt
Tunneling, boring & jacking

(29) Const. water quality filter strip, D00682 (SWM01a)
Inst. facility field marker, type S1 - 2
Inst. facility field marker, type S2
(For details, see sht. GJ-4C)

(30) Sta. "B" 470+56.04, 43.95' Lt.
Extend - 33', Lt. 5' depth
Const. sloped end
Const. paved end slope, Lt.
Const. riprap basin
(For details, see sht. GJ-22)

(31) Sta. "G" 474+43.5, 48.25' Rt.
Adjust inlet
(See drg. no. RD376)

(32) Preserve and protect telephone line

(33) Preserve and protect water line

(34) Preserve and protect gas line

REGISTERED PROFESSIONAL ENGINEER
64352
OREGON
NOVEMBER 14, 2000
AMY L. JONES
EXPIRES: 06/30/2013

OREGON DEPARTMENT OF TRANSPORTATION

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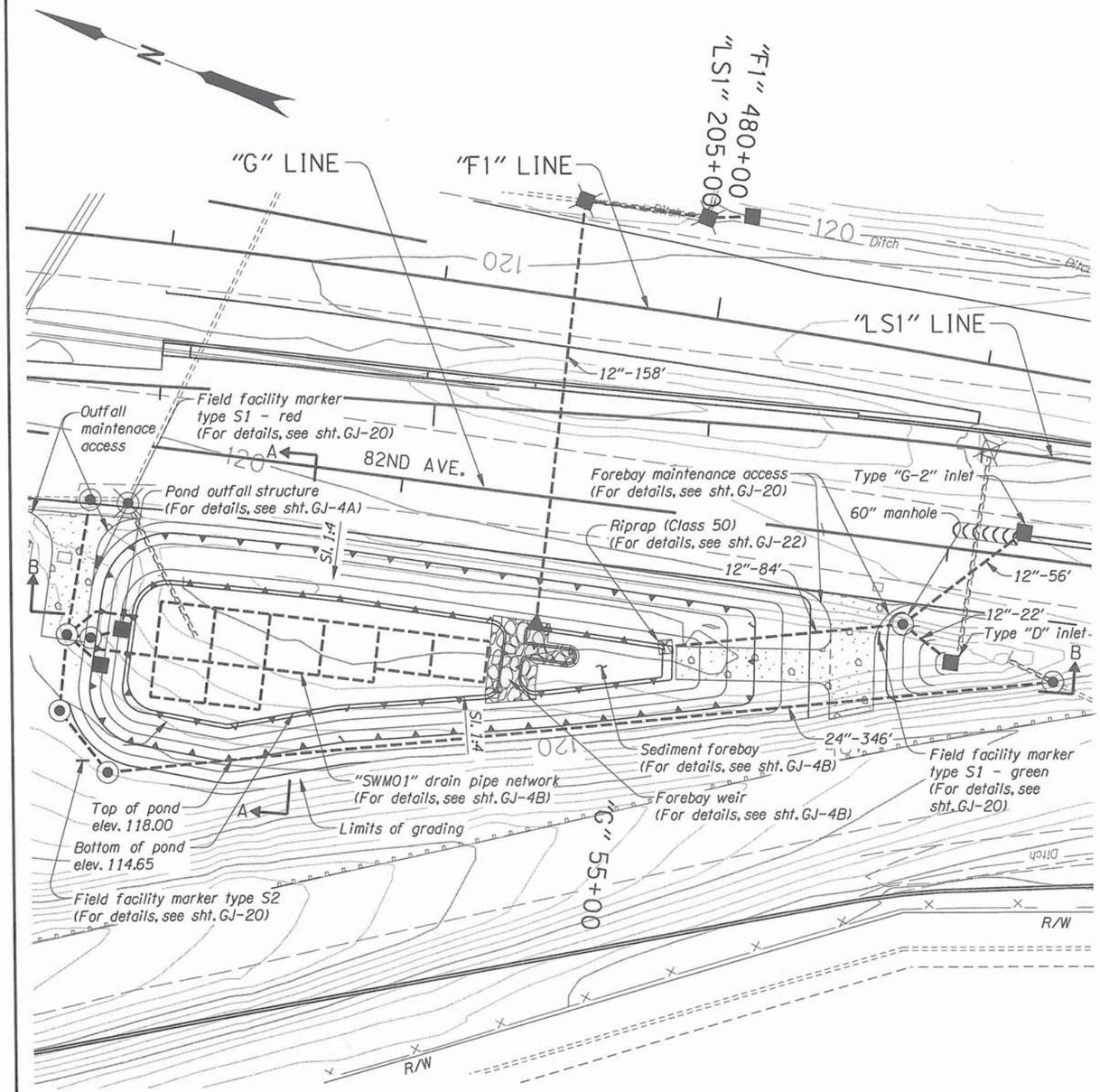
CLACKAMAS HWY.
CLACKAMAS COUNTY

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

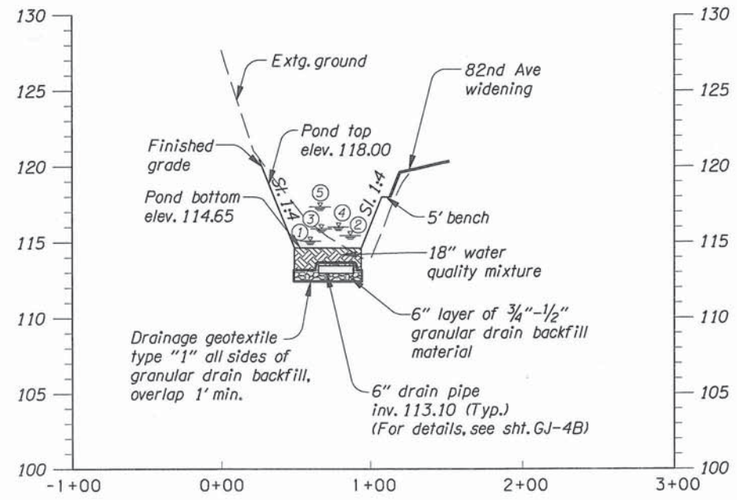
DRAINAGE & UTILITIES NOTES

SHEET NO. 3E

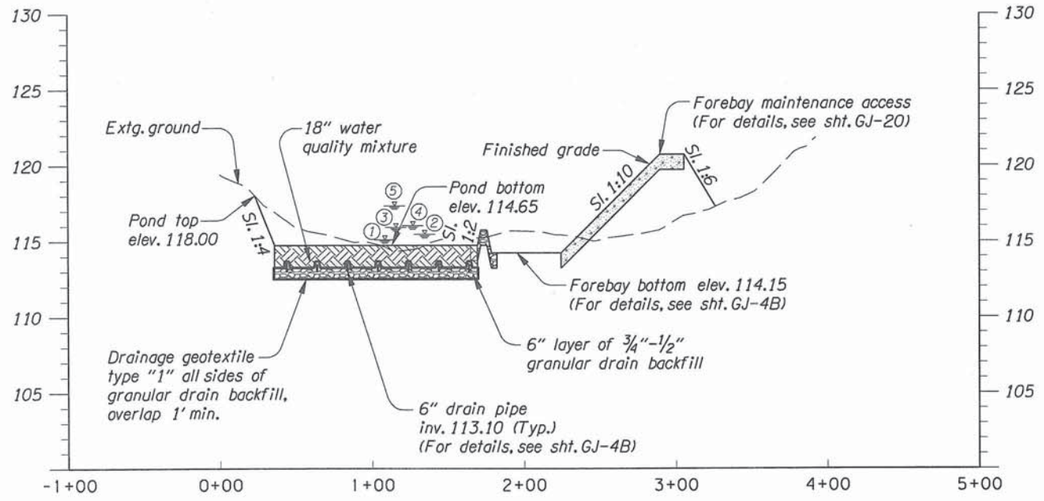
File No.



"SWM01" PLAN
BIO-RETENTION POND, DFI-D00667



SECTION A-A



SECTION B-B

1. Water quality WSE - 115.11
2. 2 year WSE - 115.92
3. 10 year WSE - 116.25
4. 25 year WSE - 116.39
5. 100 year WSE - 117.34
(Via emergency spillway only)

REGISTERED PROFESSIONAL ENGINEER
64832
OREGON
NOVEMBER 14, 2000
AMY L. JONES
EXPIRES: 06/30/2013

OREGON DEPARTMENT OF TRANSPORTATION

OBEC CONSULTING ENGINEERS
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REGIONAL OFFICES:
LAKE OSWEGO; SALEM; MEDFORD, OREGON; VANCOUVER, WASHINGTON

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

CLACKAMAS HWY.

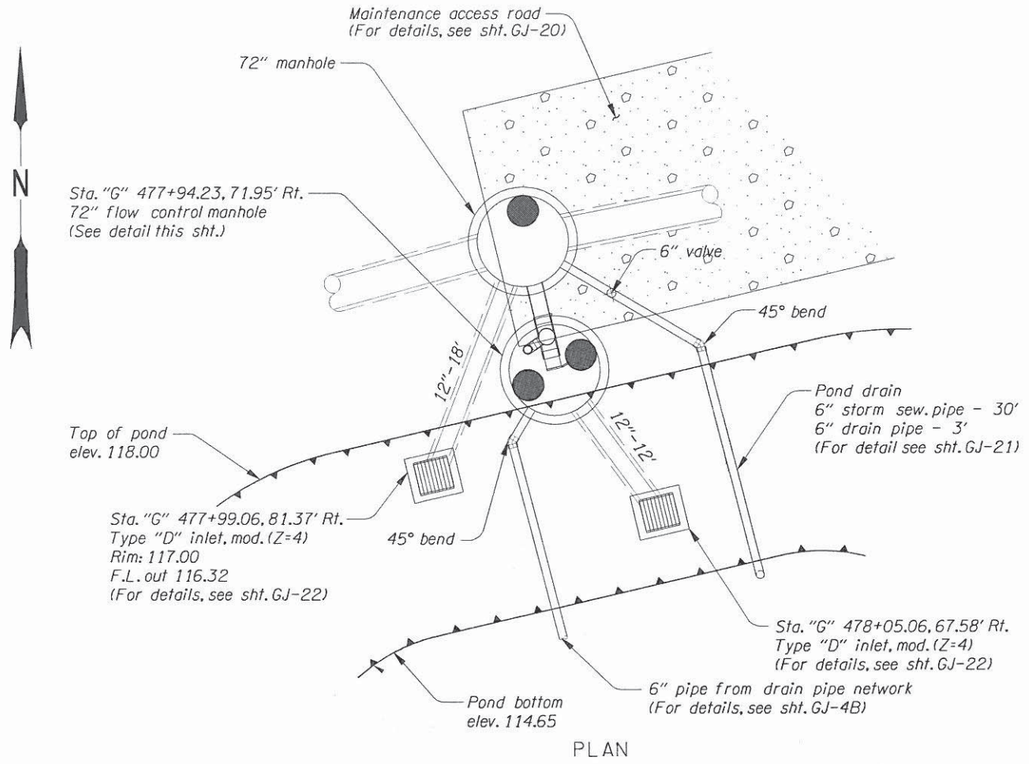
CLACKAMAS COUNTY

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

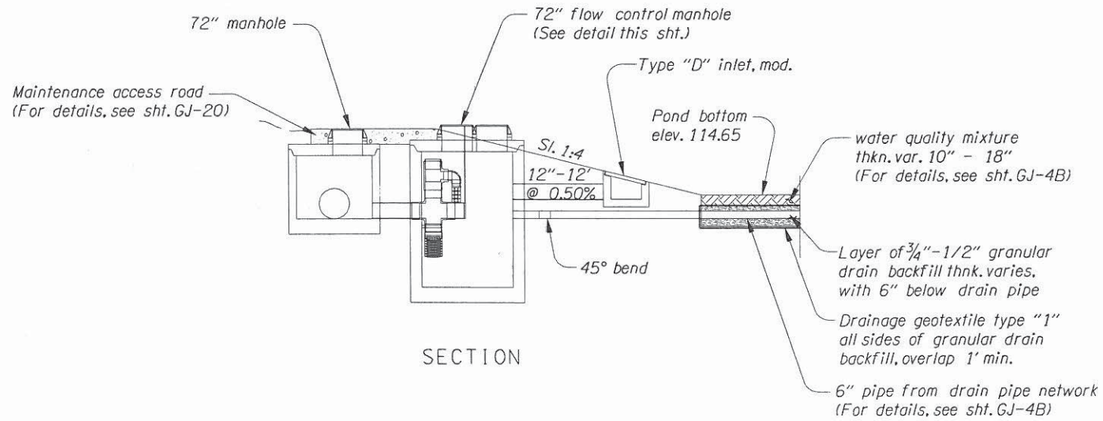
STORMWATER DETAILS

SHEET NO. GJ-4

File No.

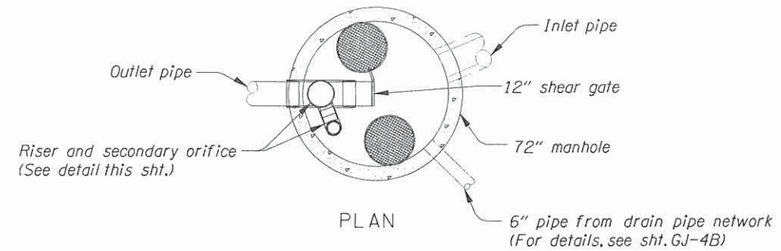


PLAN

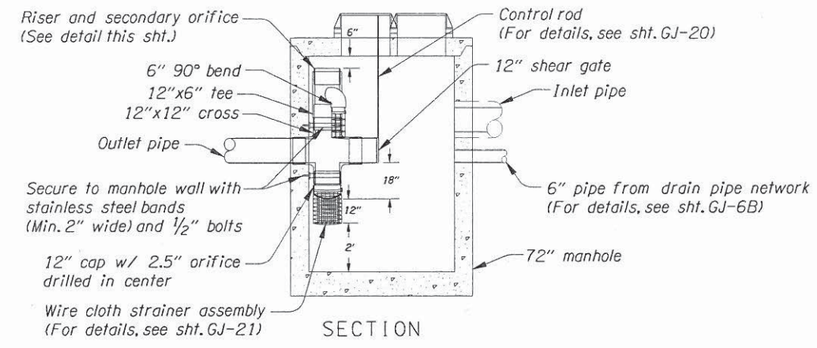


SECTION

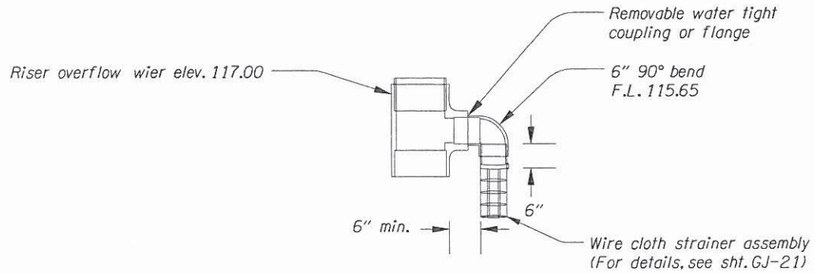
"SWM01" OUTFALL DETAIL PLAN
DFI-D00667



PLAN



SECTION



SECONDARY ORIFICE DETAIL

FLOW CONTROL MANHOLE

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

OREGON DEPARTMENT OF TRANSPORTATION

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

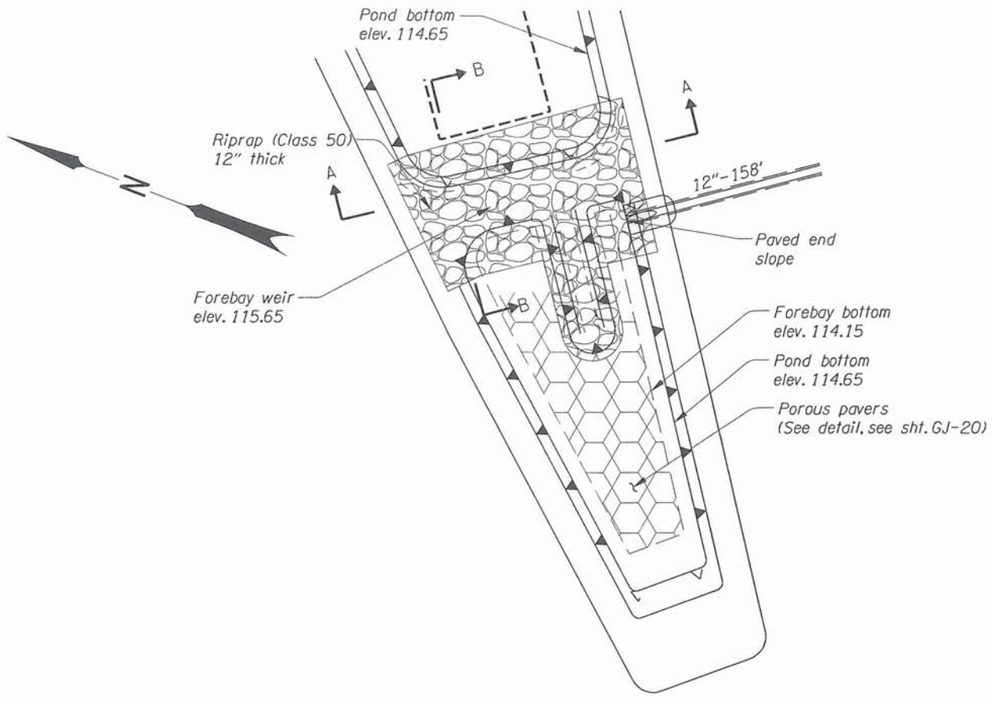
CLACKAMAS HWY.

CLACKAMAS COUNTY

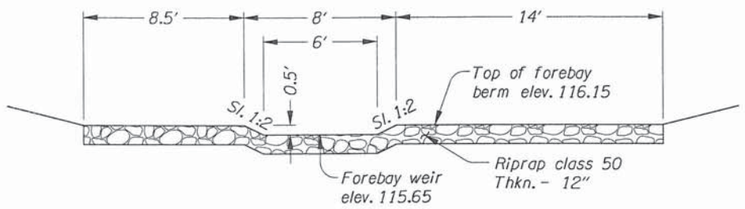
Design Team Leader - Tom Metcalf
Designed By - Ben Wewerka/Amy Jones
Drafted By - Serban Dinca/Brittney Zornado

STORMWATER DETAILS

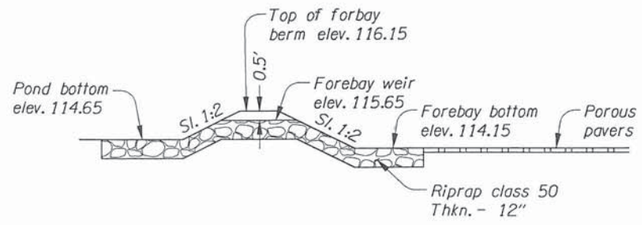
SHEET NO. GJ-4A



PLAN

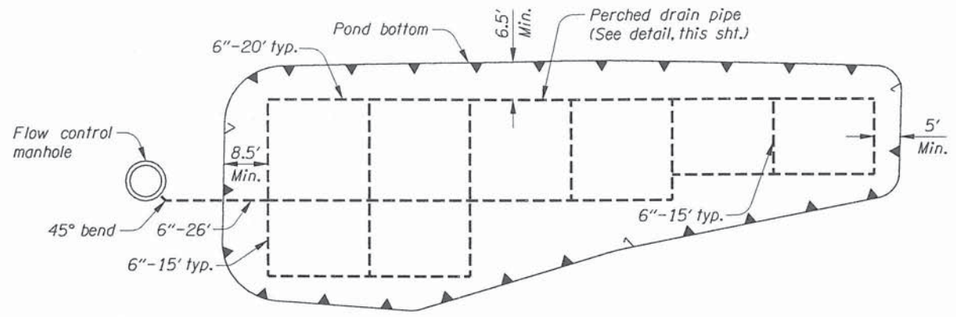


SECTION A-A

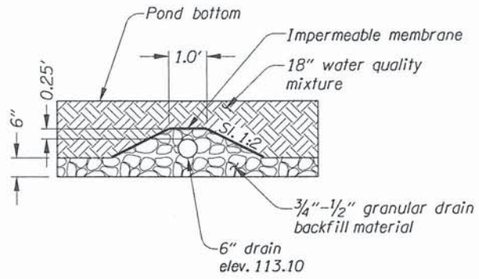


SECTION B-B

SWM01 FOREBAY DETAIL
DFI-D00667



DRAIN PIPE NETWORK DETAIL
DFI D00667



PERCHED DRAIN PIPE

REGISTERED PROFESSIONAL ENGINEER
64332
OREGON
NOVEMBER 14, 2008
AMY L. JONES
EXPIRES: 06/30/2013

OREGON DEPARTMENT OF TRANSPORTATION

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STORMWATER DETAILS

SHEET NO. GJ-4B

File No.