OPERATION & MAINTENANCE MANUAL

DFI No. : D00672

Facility Type: Bio-Retention Pond

[April, 2014]

INDEX

1. Identification

Drainage Facility ID (DFI):	**D00672**
Facility Type:	Bio-Retention Pond
Construction Drawings:	(V-File Number) 46V-022
Location:	District: 2B
	Highway No.: 75
	Mile Post: (4.54 to 4.56) Hwy 75
	Description: This facility is located northeast of the "EM" Access Road crossing beneath the Sunrise Corridor, west of the UPRR tracks, and 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 northeast of the "EM" Access Road crossing beneath the Sunrise Corridor, west of the UPRR tracks, and north of the Sunrise Corridor. Access to the facility is provided with a maintenance access road connecting to the roadway shoulder.

There is one culvert that conveys stormwater runoff from paved areas along the "EM" roadway into the detention pond. The location of this is noted on the Operation Plan as point A 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 Photo 1 and Points B and C on the Operational Plan in Appendix A.

The storm drain outlet pipe from the flow control manhole connects to the auxiliary outfall. The storm drain pipe from the auxiliary outfall is 12-inches in diameter and connects to a manhole connecting to the flow control manhole. 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

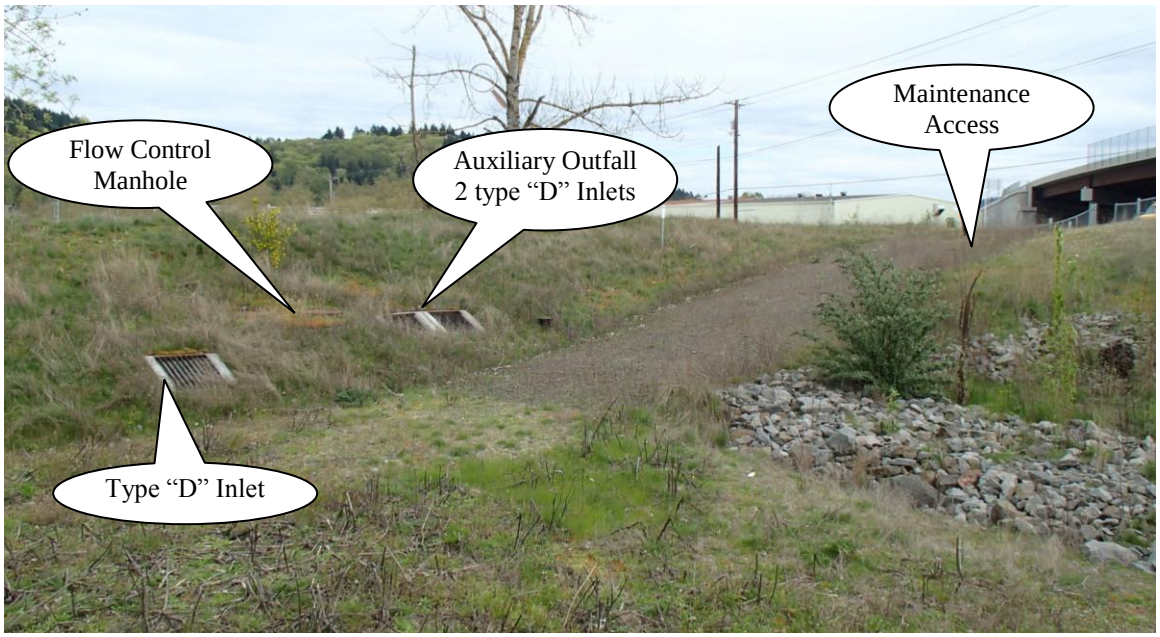


Photo 1: a view of bio retention pond, looking Northeast.

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 two “D” inlets. This inlets connect to the manhole connecting the outfall pipe from the main outfall and flow control structure. See Photo 1 and Point D 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

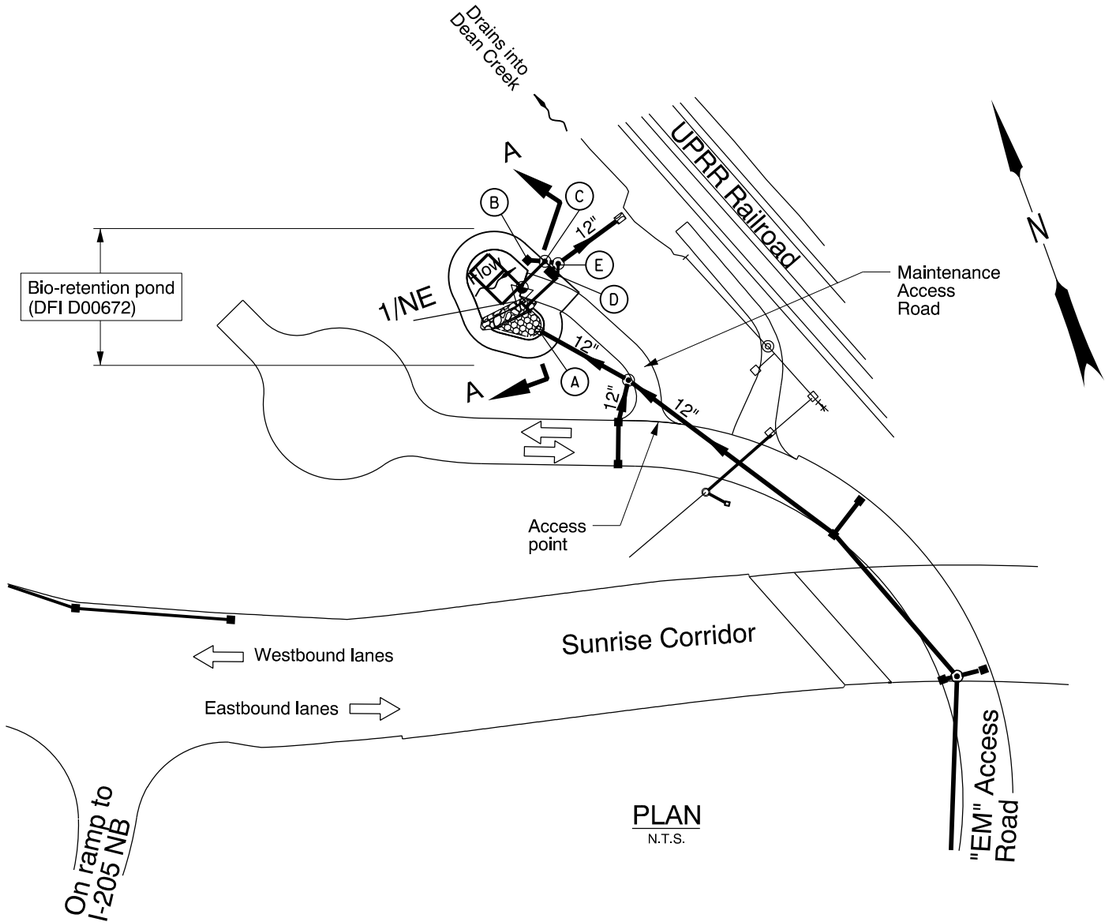
Contact any of the following for more detailed information about management of waste materials found on site:

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:

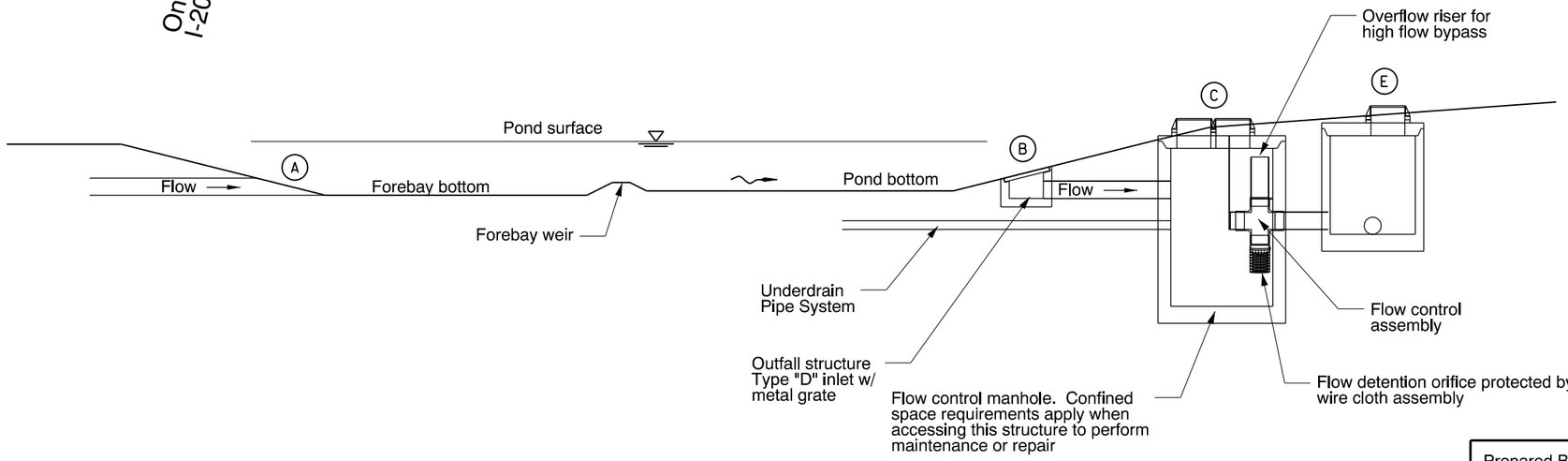
- **Operational Plan and Profile Drawing**



PLAN
N.T.S.

LEGEND:

- Photo Location / Direction
- (A) 12" storm drain pipe outlet
- (B) Type"D" Inlet and 12" storm drain pipe outfall
- (C) Flow control manhole
- (D) Auxiliary outfall - 2 Type"D" Inlets and 12" storm drain pipe outfall
- (E) Storm drain manhole
- Manhole
- Inlet
- Storm Pipe (Facility)
- Storm Pipe (Not connected to facility)
- Storm Pipe (Existing)
- Conveyance Direction
- Pavement / Facility Flow Path



SECTION A-A
N.T.S.

OREGON DEPARTMENT OF TRANSPORTATION

Prepared By: Amy Jones

Drafted By: Amy Jones

DFI D00672
MAINTENANCE DISTRICT 2B HWY 75
BIO-RETENTION POND
SUNRISE CORRIDOR MP 4.54 TO MP 4.56
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

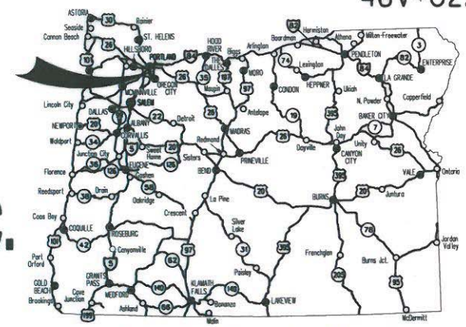
GRADING, DRAINAGE, STRUCTURES, PAVING, SIGNING, ILLUMINATION, SIGNALS & ROADSIDE DEVELOPMENT

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

CLACKAMAS HWY.

CLACKAMAS COUNTY
MARCH 2013

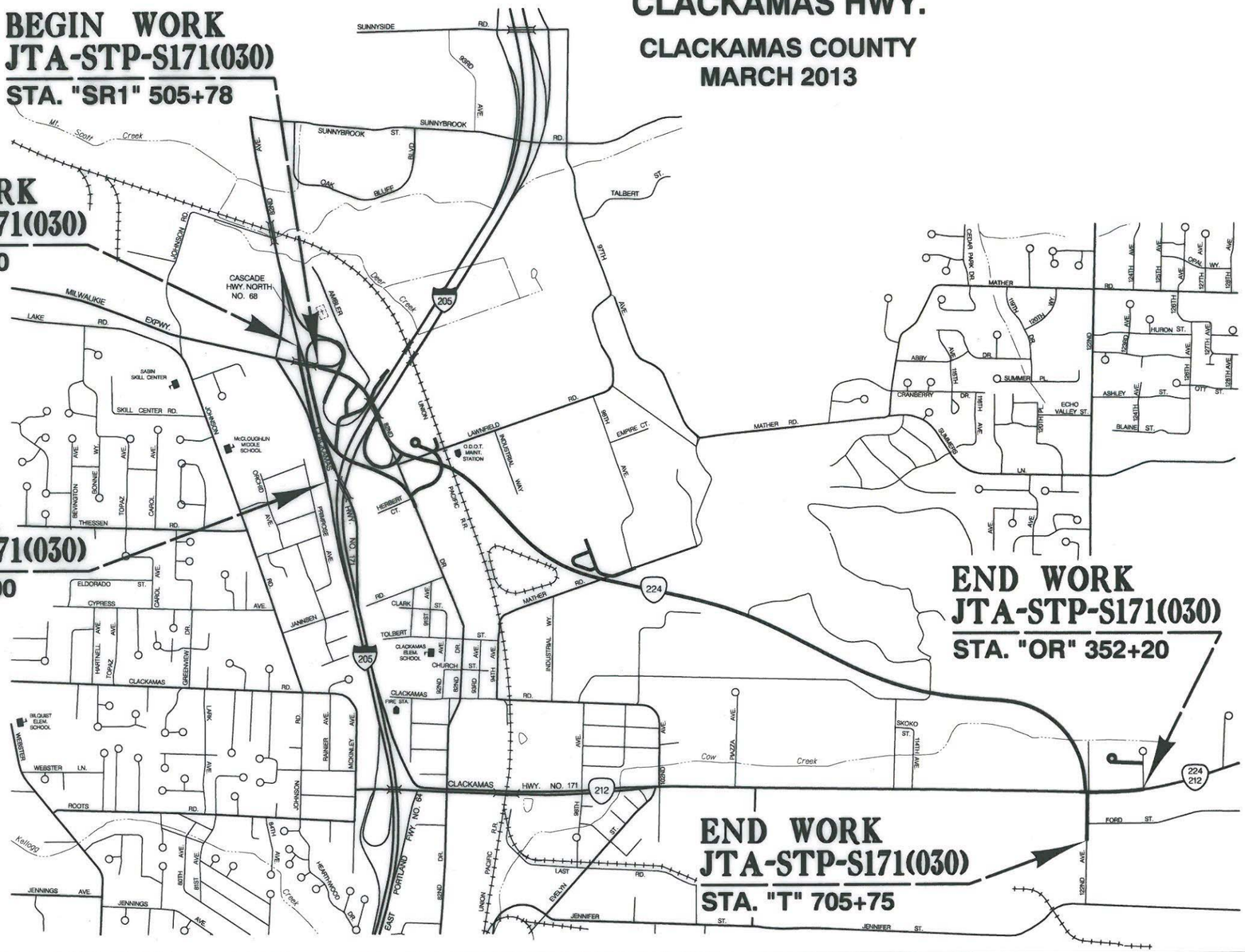
INDEX OF SHEETS	
SHEET NO.	DESCRIPTION
1	Title Sheet
1A	Index Of Sheets Cont'd.



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

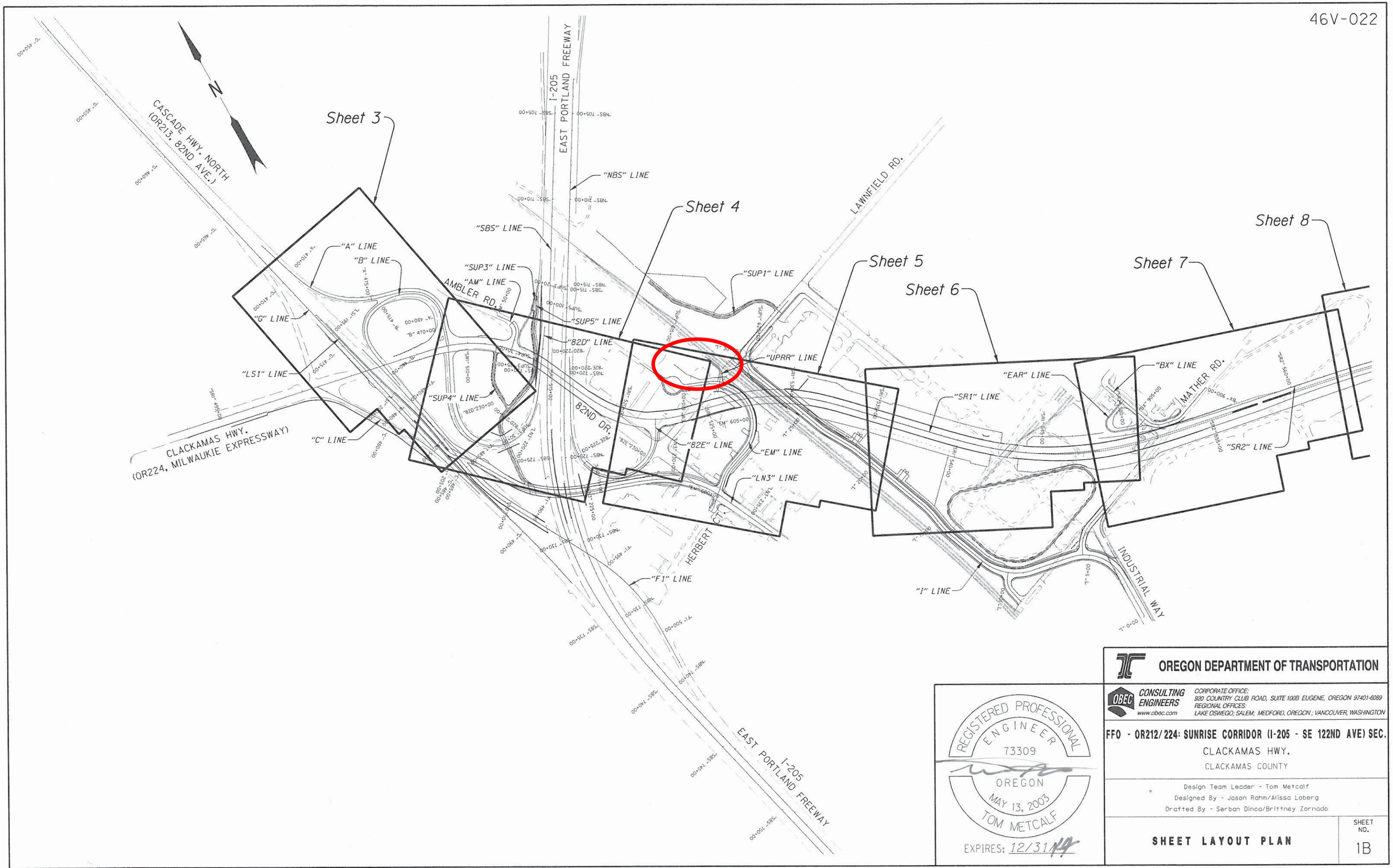
Concurrence by ODOT Chief Engineer

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.

46V-022



OREGON DEPARTMENT OF TRANSPORTATION

OBEC CONSULTING ENGINEERS
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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 & 9, T. 2 S., R. 2 E., W.M.

46V-022

DFI D00672
Bio-retention pond
SWM05

"UPRR" LINE
"EM" LINE
"SR1" LINE
"I" LINE
"82E" LINE
"EM" 610+00
"EM" 605+00
"SR1" 525+00
"SR1" 530+00
"I" 525+00
"SR1" 535+00
LAWNFIELD RD.
82ND DR.
UNION PACIFIC RR.
SEE SHEET 4D MATCH LINE
MATCH LINE SEE SHEET 16D
MATCH LINE SEE SHEET 16D
See enlargement, sht. 5D-2
Temp. const. ease.
Perm. ease.
R/W
12"-10'
12"-15'
12"-18'
12"-188'
12"-88'
12"-254'
12"-70'
12"-50'
18"-253'
18"-44'
18"-73'
6"-120'
12"-28'
6"-37'
6"-57'

LEGEND
No work area
Regulated work area

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

OREGON DEPARTMENT OF TRANSPORTATION

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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. 5D

File No.

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Sec. 4 & 9, T. 2 S., R. 2 E., W.M.

46V-022

DFI D00672
Bio-retention pond
SWM05

"UPRR" LINE

"EM" LINE

"EM" 610+00

"82E" LINE

"SR1" 525+00

"SR1" LINE

82ND DR.

LAWNFIELD RD.

R/W

Temp. const. ease.

Perm. ease.

12"-130'
12"-103'
12"-47'
12"-28'
24"-65'
18"-169'
12"-16'
12"-45'
12"-44'
12"-13'
12"-15'
6"-3'
12"-58'
18"-124'

LEGEND

No work area

Regulated work area

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

OREGON DEPARTMENT OF TRANSPORTATION

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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. 5D-2

File No.

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1. Remove pipe - 511'
2. Abandon pipe
3. Remove inlet - 18
4. Remove manhole
5. Sta. "SR1" 531+26.94, 35.93' Rt.
   Const. type "G-2" inlet
   Inst. 12" storm sew. pipe - 15'
   5' depth
6. Sta. "SR1" 531+42.26, 36.28' Rt.
   Const. type "G-2" inlet
   Inst. 12" storm sew. pipe - 254'
   5' depth
7. Sta. "SR1" 532+46.32, 2.1' Lt.
   Const. type "G-2" inlet
   Inst. 12" storm sew. pipe - 50'
   5' depth
8. Sta. "SR1" 532+96.54, 2.1' Lt.
   Const. type "G-2" inlet
   Inst. 12" storm sew. pipe - 70'
   5' depth
9. Sta. "SR1" 533+66.75, 2.1' Lt.
   Const. type "G-2" inlet
   Inst. 12" storm sew. pipe - 50'
   5' depth
10. Sta. "SR1" 534+00.33, 34.9' Rt.
    Const. mahole 72" dia. with type "G-2" inlet
    Inst. 18" storm sew. pipe - 44'
    20' depth
    Inst. slope anchors - 2
    (See drg. nos. RD330, RD332 & RD348)
11. Sta. "SR1" 533+94.94, 78.04' Rt.
    Const. storm manhole
    Inst. 18" storm sew. pipe - 73'
    5' depth
12. Sta. "SR1" 533+74.48, 147.77' Rt.
    Connect to manhole
    (Industrial Way extension)
    (For sht. nos., see sht. 1A-4)
13. Sta. "SR1" 534+00.33, 34.9' Rt. to
    Sta. "SR1" 536+53.77, 34.9' Rt.
    Inst. 18" storm sew. pipe - 253'
    10' depth
14. Industrial Way extension
    (For sht. nos., see sht. 1A-4)
15. Sta. "EM" 603+00.01, 13.8' Rt.
    Const. type "G-2" inlet
    Inst. 12" storm sew. pipe - 28'
    5' depth
16. Sta. "EM" 602+99.48, 13.9' Lt.
    Const. type "G-2" inlet
    Inst. 12" storm sew. pipe - 88'
    5' depth
17. Sta. "EM" 603+89.71, 0.3' Rt.
    Const. storm manhole
    Inst. 12" storm sew. pipe - 188'
    5' depth
18. Sta. "EM" 605+85.19, 4.2' Lt.
    Const. storm manhole
    Inst. 18" storm sew. pipe - 124'
    5' depth
19. Sta. "EM" 607+15.63, 13.9' Rt.
    Const. type "G-2" inlet
    Inst. 12" storm sew. pipe - 28'
    5' depth
20. Sta. "EM" 607+15.61, 13.9' Lt.
    Const. type "G-2" inlet
    Inst. 18" storm sew. pipe - 169'
    10' depth
21. Inst. impermeable check dam
    (For details, see sht. GJ-18)
22. Sta. "EM" 608+77.30, 13.9' Lt.
    Const. type "G-2" inlet
    Inst. 12" storm sew. pipe - 28'
    5' depth
23. Sta. "EM" 608+77.50, 13.9' Rt.
    Const. type "G-2" inlet
    Inst. 12" storm sew. pipe - 28'
    10' depth
24. Sta. "EM" 608+71.30, 41.7' Rt.
    Const. storm manhole 60" dia.
    Inst. 24" storm sew. pipe - 65'
    10' depth
    Const. sloped end
    Const. paved end slope, Rt.
    Const. riprap basin
    (For details, see sht. GJ-22)
25. Const. bio-retention pond, D00672 (SWM05)
    Inst. facility field markers, type S1-2
    Inst. facility field marker, type S2
    Conc. pipe anchor - 2
    Aggregate base - 155 tons
    6" gate valve
    (For details, see shts. GJ-8 & GJ-8A)
26. Sta. "EM" 609+19.96, 111.80' Rt.
    Const. storm manhole 72" dia.
    Inst. 12" storm sew. pipe - 47'
    10' depth
    Const. riprap basin
    (For details, see sht. GJ-22)
27. Sta. "EM" 607+94.9, 29.5' Lt.
    Const. type "D" inlet
    Inst. 12" storm sew. pipe - 16'
    10' depth
28. Sta. "EM" 608+12.7, 26.1' Lt.
    Const. storm manhole over extg. storm sew. pipe
    Inst. 12" storm sew. pipe - 58'
    10' depth
    Connect to extg. storm sew. pipe
29. Sta. "SR1" 532+69.32, 127.39' Lt.
    Const. manhole over extg. storm sew. pipe
30. Sta. "SR1" 532+61, 104' Lt.
    Const. area drainage basin
    over extg. storm sew. pipe
    Remove dirt and debris from extg. pipe prior to connection
    (See drg. no. RD374)
31. Sta. "SR1" 533+45, 88.5' Lt.
    Const. area drainage basin
    over extg. storm sew. pipe
    Remove dirt and debris from extg. pipe prior to connection
32. Sta. "SR1" 522+58.11, 43.86' Lt.
    Const. type "G-2" inlet
    Inst. 12" storm sew. pipe - 103'
    5' depth
33. Sta. "SR1" 521+47.84, 38' Lt.
    Const. type "G-2" inlet
34. See sht. 4D, note 16
    Inst. 12" storm sew. pipe
35. Sta. "EM" 605+83.29, 13.9' Rt.
    Const. type "G-2" inlet
    Inst. 12" storm sew. pipe - 18'
    5' depth
36. Sta. "EM" 605+86.54, 13.9' Lt
    Const. type "G-2" inlet
    Inst. 12" storm sew. pipe - 10'
    5' depth
37. Sta. "SR1" 523+54.49, 56.5' Rt.
    Const. type "D" inlet
    Inst. 12" storm sew. pipe - 16'
    10' depth
38. Sta. "SR1" 523+66.88, 47.3' Rt.
    Const. storm manhole 60" dia.
    Inst. 12" storm sew. pipe - 45'
    10' depth
    Inst. 12" storm sew. pipe - 15' stub
    10' depth
    Plug and mark for future extension
39. Sta. "EM" 602+18.17, 25.6' Lt.
    Const. type "D" inlet, modified
    Inst. 6" storm sew. pipe - 37'
    5' depth
    (For details, see sht. GJ-22)
40. Sta. "EM" 602+54.69, 25.3' Lt.
    Const. manhole over extg. storm sew. pipe
    Inst. 6" storm sew. pipe - 57'
    5' depth
41. Sta. "EM" 602+56.14, 31.26' Rt.
    Const. storm manhole
    Inst. 6" storm sew. pipe - 120'
    10' depth
42. Sta. "EM" 603+67.35, 33.15' Rt.
    Const. shallow manhole over extg. storm sew. pipe
43. Preserve and protect gas line
44. Relocate sanitary sewer
    (For details see shts. SA-2 & SA-3)
45. Relocate electrical line
    (By others)
46. Utilities relocated prior to construction
47. Adjust gas valve box
    (By others)
48. Reconstruct waterline
    (For details, see shts. WA-N2a & WA-N2b)
49. Preserve and protect fiber line
50. Preserve and protect comcast facility
51. Sta. "SR1" 523+78.23, 52.56' Rt.
    Relocate manhole
    Const. cleanout - 2
    Inst. 6" storm sew. pipe - 3'
    5' depth
    Inst. 12" storm sew. pipe 57'
    5' depth
    30° bends - 5
    12"x6" tee
    Connect to extg. storm sew. pipe - 2
    Connect to extg. manhole
    (For details, see sht. GJ-24)
    (See drg. nos. RD362, RD388 & RD390)
52. Sta. "EM" 602+18.12, 25.06' Lt. to
    Sta. "EM" 605+52.15, 143' Lt.
    Inst. two 275' sched. 40 conduits
    for future Comcast use
    Cap & protect ends
    Utilize 36", sched. 80, 90° sweeps
    Coordinate with Comcast
53. Sta. "EM" 602+68.12, 25.06' Lt. to
    Sta. "EM" 605+52.15, 143.5' Lt.
    Inst. 275', 4" electrical conduit for PGE
    service to Comcast hub facility
    Coordinate with PGE
54. Sta. "EM" 608+00, 77.7' Rt.
    Major adjust manhole

REGISTERED PROFESSIONAL ENGINEER
64372
OREGON
NOVEMBER 14, 2000
AMY L. JONES
EXPIRES: 06/30/2013

OREGON DEPARTMENT OF TRANSPORTATION

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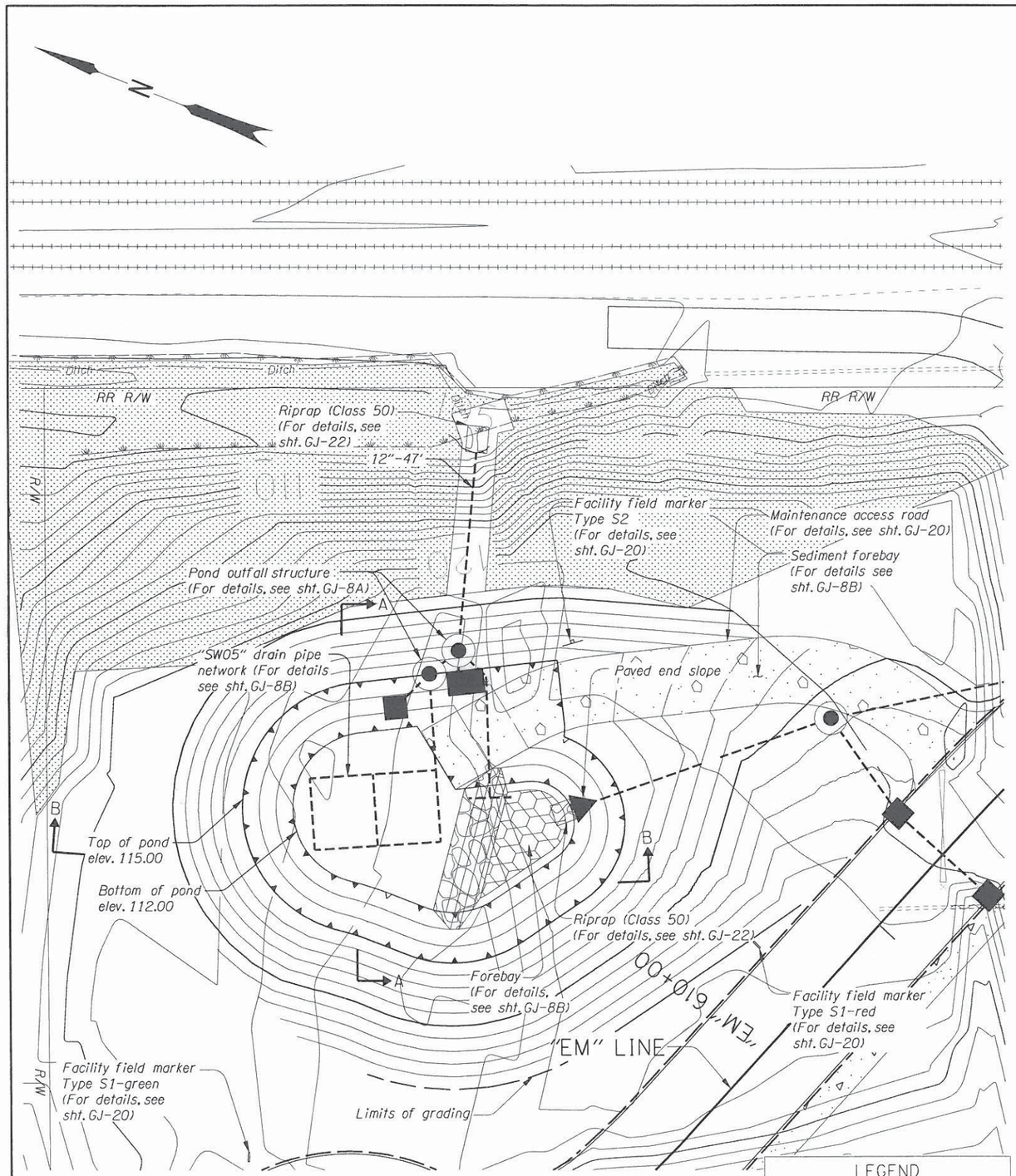
REGIONAL OFFICES:
LAKE OSWEGO; SALEM; MEDFORD, OREGON; VANCOUVER, WASHINGTON

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

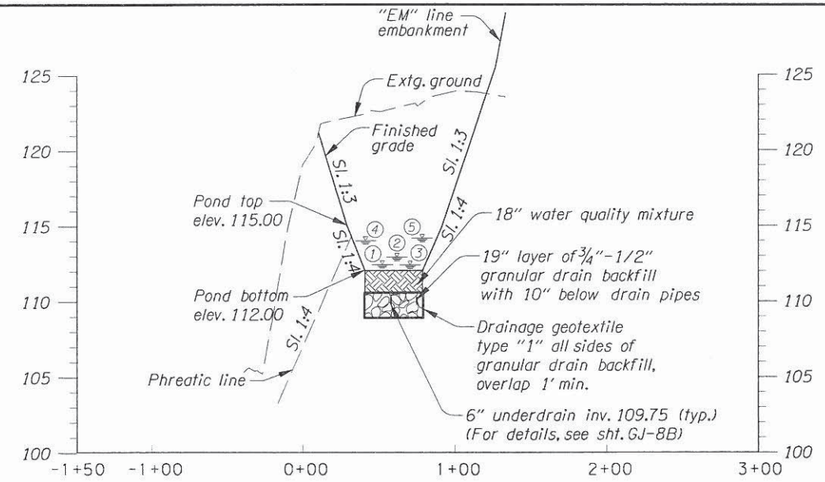
Design Team Leader - Tom Metcalf
Designed By - Ben Wewerka/Amy Jones
Drafted By - Serban Dinca/Brittney Zornado

DRAINAGE & UTILITIES NOTES

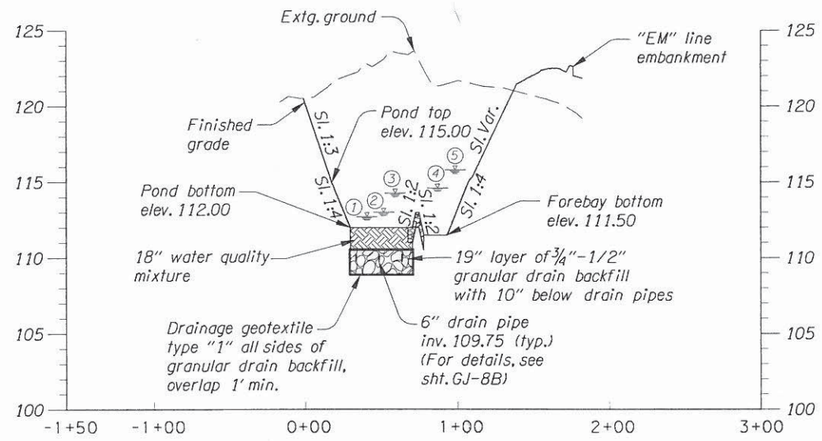
SHEET NO. 5E



"SWM05" DETAIL
BIO-RETENTION POND, DFI-D00672



SECTION A-A



SECTION B-B

(1) Water quality WSE - 112.71
(2) 2 year WSE - 112.51
(3) 10 year WSE - 112.89
(4) 25 year WSE - 113.03
(5) 100 year WSE - 114.23
(Via emergency spillway only)

REGISTERED PROFESSIONAL ENGINEER
64732
OREGON
NOVEMBER 14, 2000
AMY L. JONES
EXPIRES: 06/30/2013

OREGON DEPARTMENT OF TRANSPORTATION

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

Design Team Leader - Tom Metcalf
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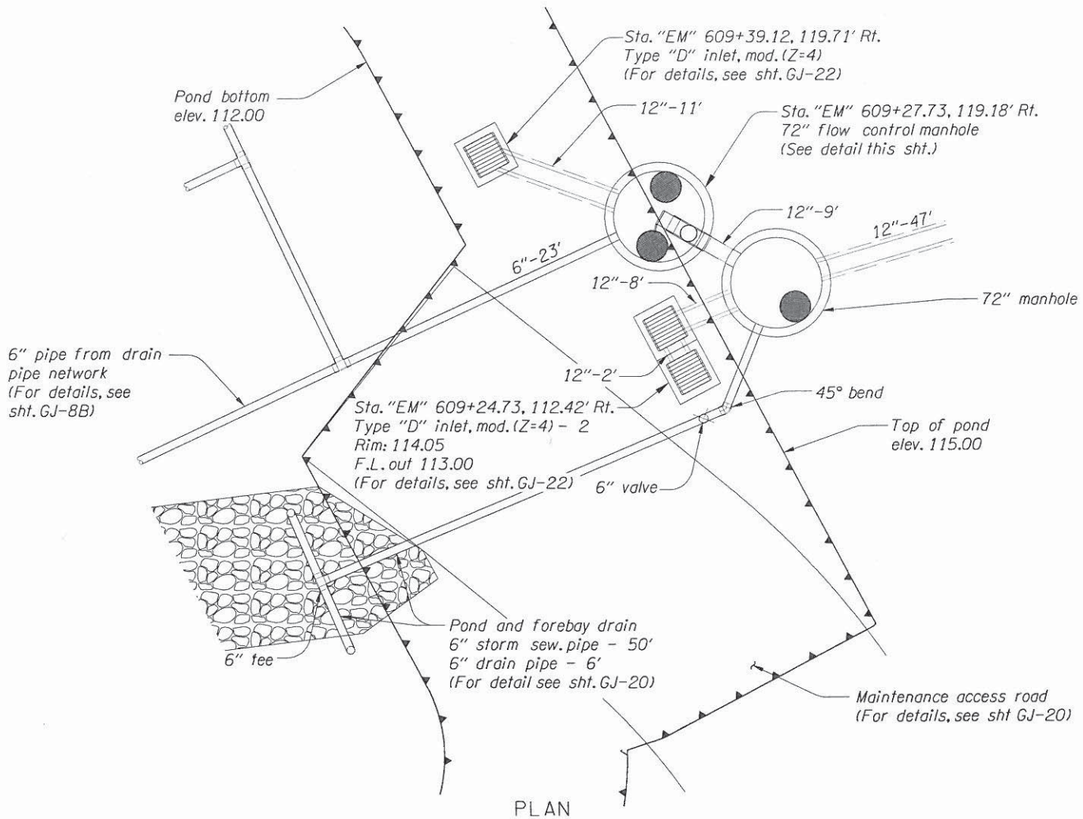
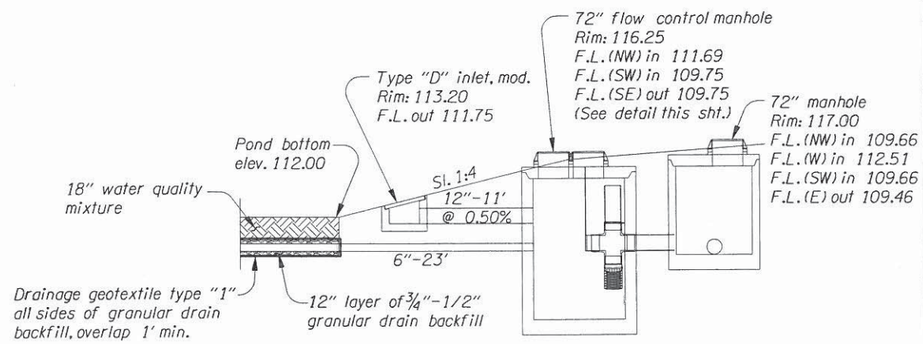
STORMWATER DETAILS

SHEET NO. GJ-8

File No.

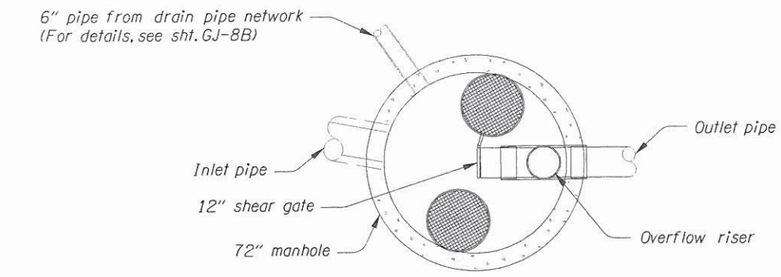


PLAN



SECTION

"SWM05" OUTFALL STRUCTURE DETAIL
DFI-D00672



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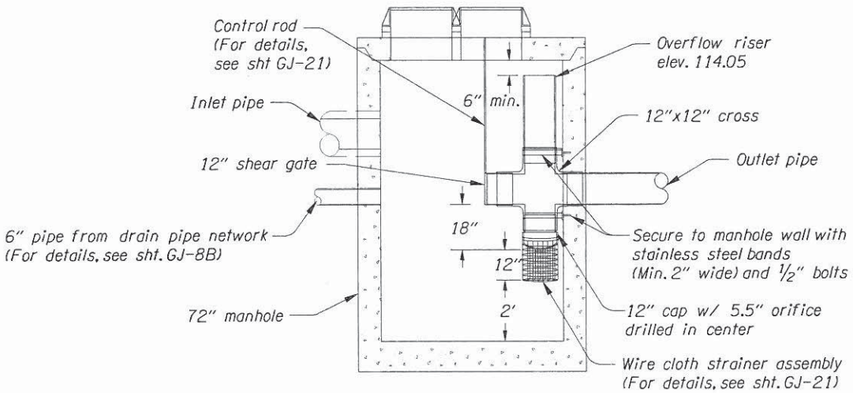

SECTION

FLOW CONTROL MANHOLE
DFI-D00672

REGISTERED PROFESSIONAL ENGINEER
64382
OREGON
NOVEMBER 14, 2000
AMY L. JONES
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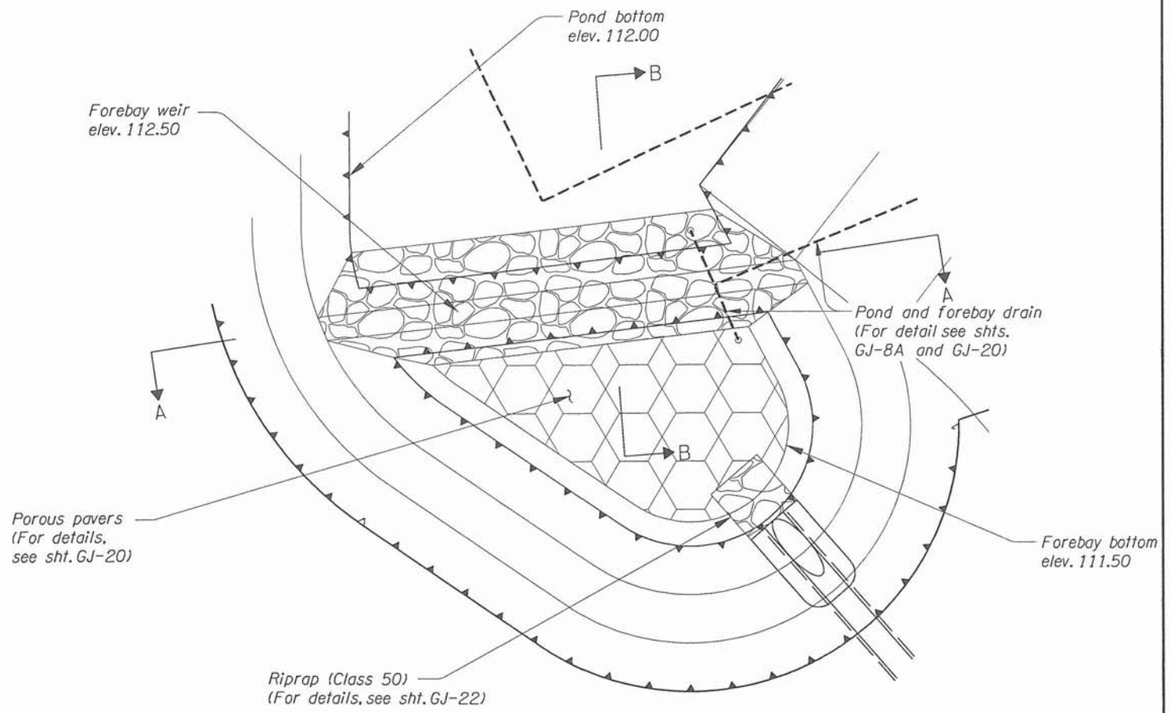
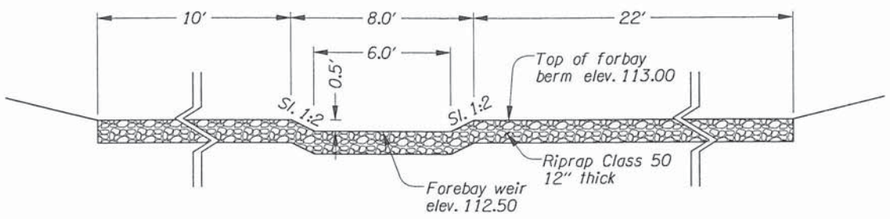
STORMWATER DETAILS

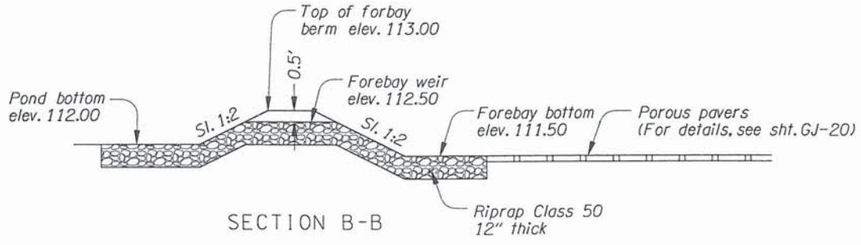
SHEET NO. GJ-8A

File No.



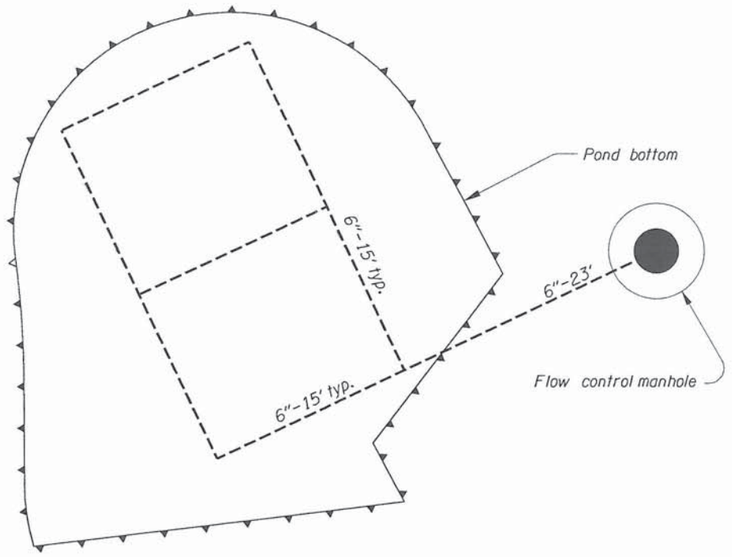


SECTION A-A



SECTION B-B

"SWM05" FOREBAY DETAIL
DFI-D00672



"SWM05" DRAIN PIPE NETWORK DETAIL
DFI-D00672

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NOVEMBER 14, 2000
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STORMWATER DETAILS

SHEET NO. GJ-8B

File No.