OPERATION & MAINTENANCE MANUAL

DFI No. : D00669
Facility Type: Water Quality Biofiltration Swale

[April, 2018]

INDEX

1. Identification

Drainage Facility ID (DFI):	**D00669**
Facility Type:	Water Quality Biofiltration Swale
Construction Drawings:	(V-File Number) 46V-022
Location:	District: 2B
	Highway No.: 068
	Mile Post: 0.12;0.13 (beg./end)
	Description: This facility is located on the north side of the OR 213 northbound on ramp from 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

4. Engineer of Record: Consultant Designer – [OBEC Consulting Engineers, Amy Jones, 971-634-2005]

Facility construction: [2014]
Contractor: Kerr Contractors, Inc.

5. Storm Drain System and Facility Overview

A water quality swale is a flat-bottomed open channel designed to treat stormwater runoff from highway pavement areas. This type of facility is lined with grass. Treatment by trapping sedimentation occurs when stormwater runoff flows through the grass.

This biofiltration swale is designed to treat runoff from the water quality design storm and provide infiltration prior to entering the existing storm drain pipe system in Interstate 205 prior to entering Dean Creek. It is located on the north side of the OR 213 northbound on ramp from the Sunrise Corridor.

The stormwater runoff sheet flows from paved areas along the Interstate 205 Alignment to a drainage curb on the north side of the ramp. A curb opening inlet has been constructed to direct the flows from the ramp and into the swale. The location of this is noted on the Operation Plan as point A in Appendix A.

Runoff exits the swale by way of a Type “D” inlet connected to a 12-inch storm drain outlet pipe. See Photo 1 and Point B on the Operational Plan in Appendix A.

The storm drain outlet pipe from the inlet and 12” pipe connect into a pipe system that drains to Dean Creek. The receiving waterway for the outlet pipe is Dean Creek.

A. Maintenance equipment access:
   The swale and outfall structure can be accessed directly from the shoulder of the on ramp to OR 213 northbound.

B. Heavy equipment access into facility:

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

C. Special Features:

   ☒ Amended Soils
   ☐ Porous Pavers
   ☐ Liners
   ☐ Underdrains

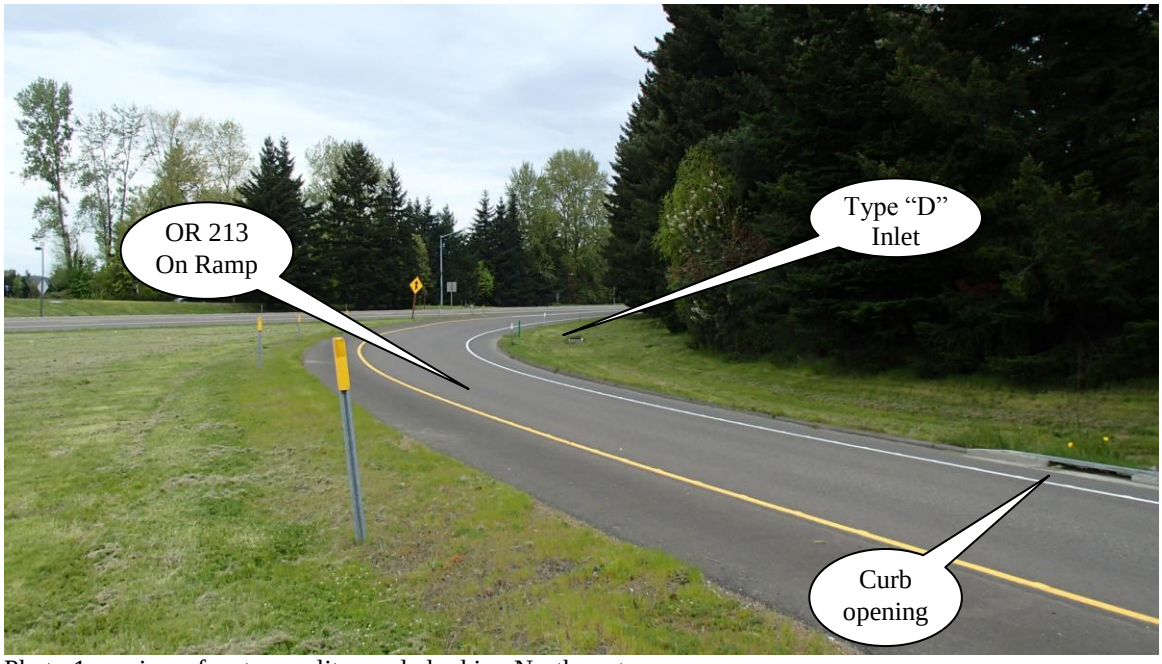


Photo 1: a view of water quality swale looking Northwest

6. Facility Haz Mat Spill Feature(s)

The water quality biofiltration swale 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 at the west end of the swale. A barrier such as a metal plate over the metal grate on the inlet could be used to prevent liquid from draining from the swale.

7. Auxiliary Outlet (High Flow Bypass)

There is no auxiliary outlet provided for the water quality swale. Storm events larger than the water quality storm will overtop the swale and sheet flow to the drainage system downstream of the swale.

8. 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:

9. 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

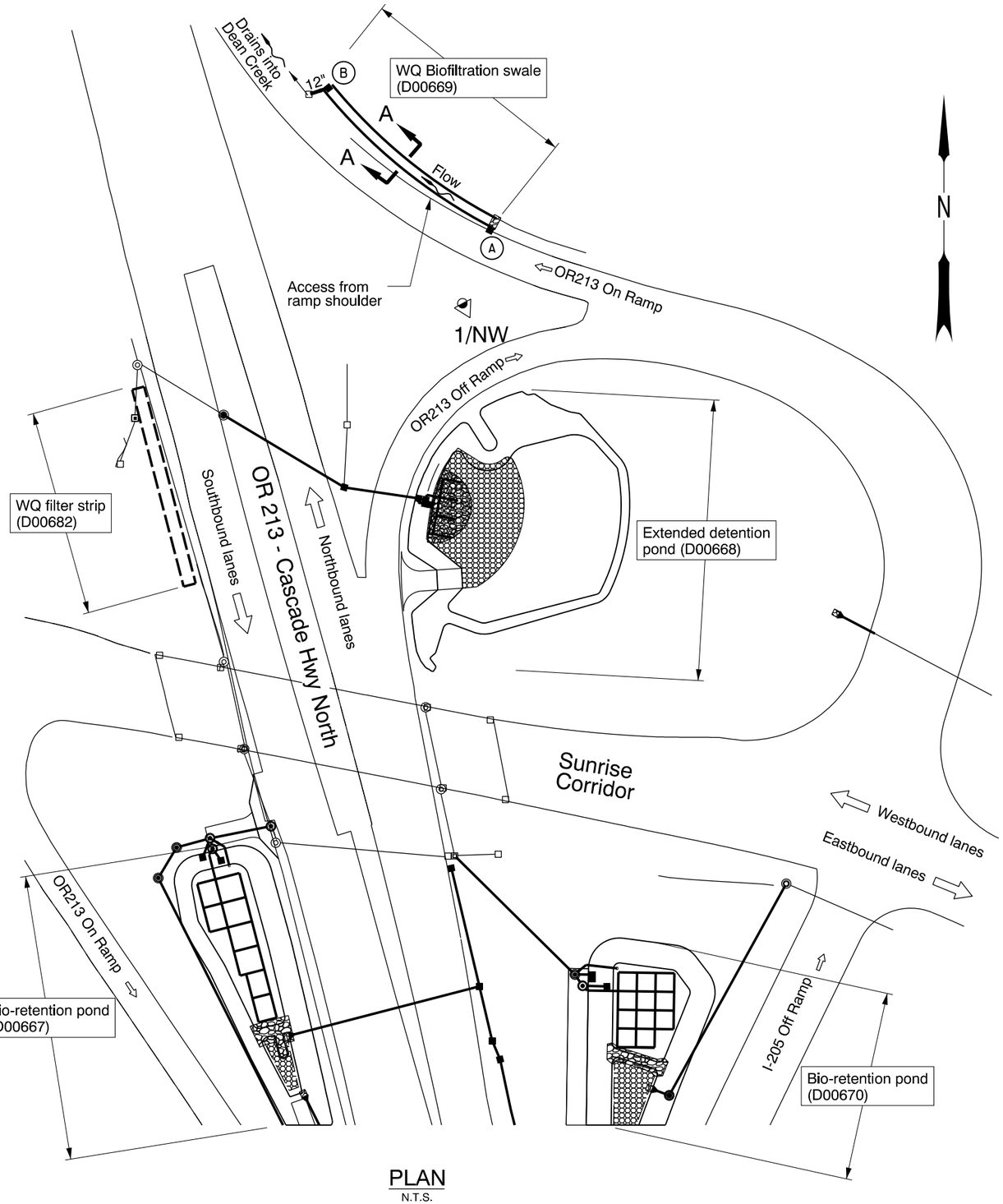
Contact any of the following for more detailed information about management of waste materials found on site:

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**

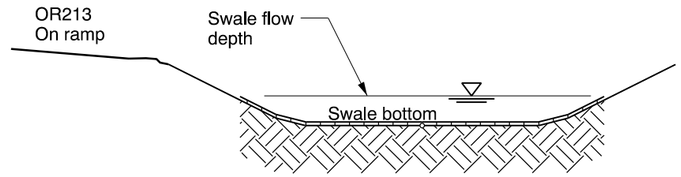


PLAN
N.T.S.

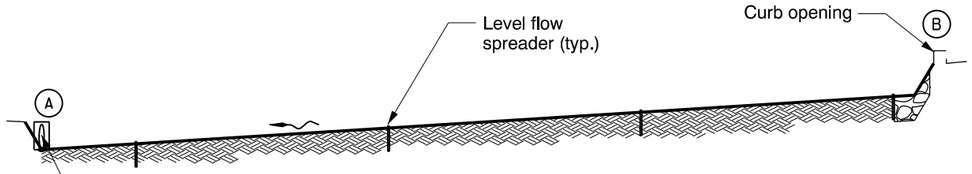
N

LEGEND:

- Photo Location / Direction
- (A) Curb opening
- (B) Type"D" Inlet and 12" storm drain pipe outfall
- 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.



PROFILE
N.T.S.

OREGON DEPARTMENT OF TRANSPORTATION

Prepared By: Amy Jones

Drafted By: Amy Jones

DFI D00669
MAINTENANCE DISTRICT 2B HWY 68
WATER QUALITY BIOFILTRATION SWALE
CASCADE HWY NORTH MP 0.10 TO MP 0.12
CLACKAMAS COUNTY

Appendix B

Content:

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

46V-022

STATE OF OREGON

DEPARTMENT OF TRANSPORTATION

PLANS FOR PROPOSED PROJECT

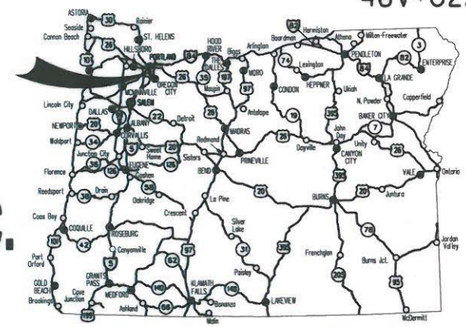
GRADING, DRAINAGE, STRUCTURES, PAVING, SIGNING, ILLUMINATION, SIGNALS & ROADSIDE DEVELOPMENT

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

CLACKAMAS HWY.

CLACKAMAS COUNTY
MARCH 2013

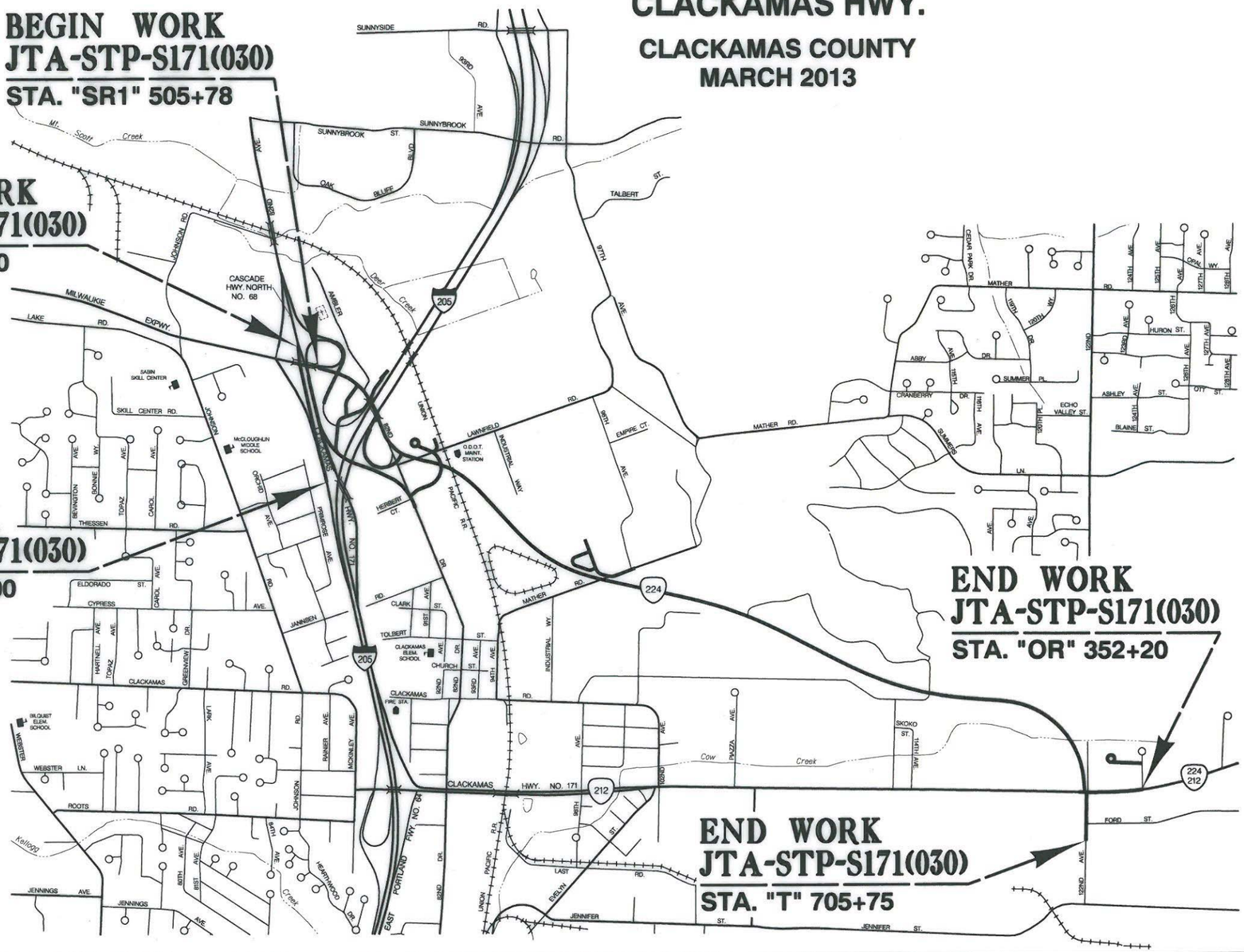
INDEX OF SHEETS	
SHEET NO.	DESCRIPTION
1	Title Sheet
1A	Index Of Sheets Cont'd.



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

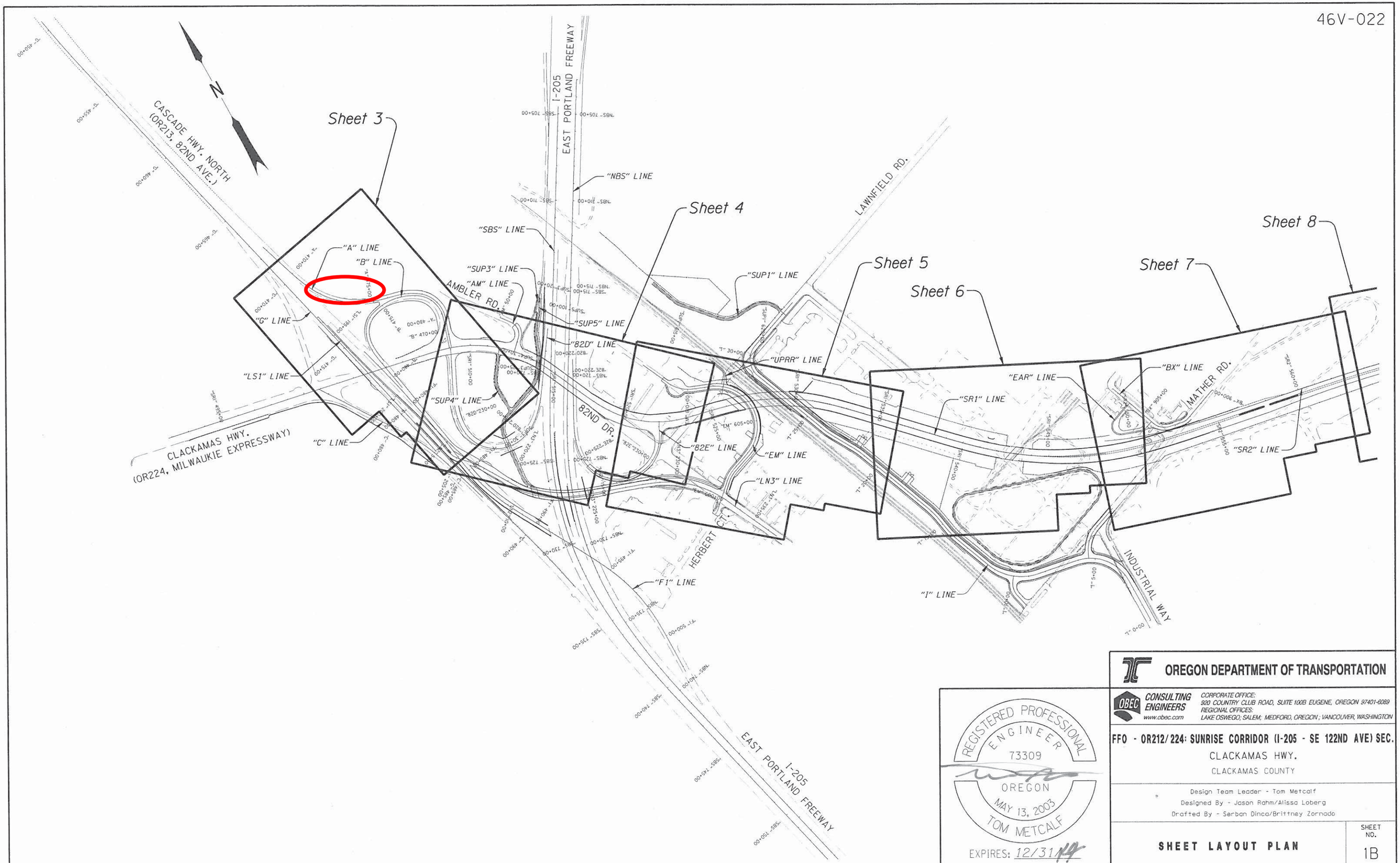
Concurrence by ODOT Chief Engineer

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



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

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 - Jason Rahm/Alissa Loberg
Drafted By - Serban Dinca/Brittney Zornado

SHEET LAYOUT PLAN

SHEET NO. 1B

File No.

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

SEE SHEET 4D
MATCH LINE

"82D" LINE

"B" 470+00

"B" LINE

"B" 475+00

"SR1" LINE

"F1" 475+00

"A" 475+00

"A" 470+00

"A" LINE

"B" R/W (OR224, MILWAUKIE EXPRESSWAY)

"B" 480+00

"LS1" LINE

"G" LINE

"F1" LINE

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

"S1" 195+00

"G" 475+00

"G" R/W

"G" 470+00

"82D" 230+00

"F1" 480+00

MATCH LINE
SEE SHEET 15D

12" - 33'
12" - 16'
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

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.
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, RD328, 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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FFO - OR212/224: SUNRISE CORRIDOR (I-205 - SE 122ND AVE) SEC.

CLACKAMAS HWY.

CLACKAMAS COUNTY

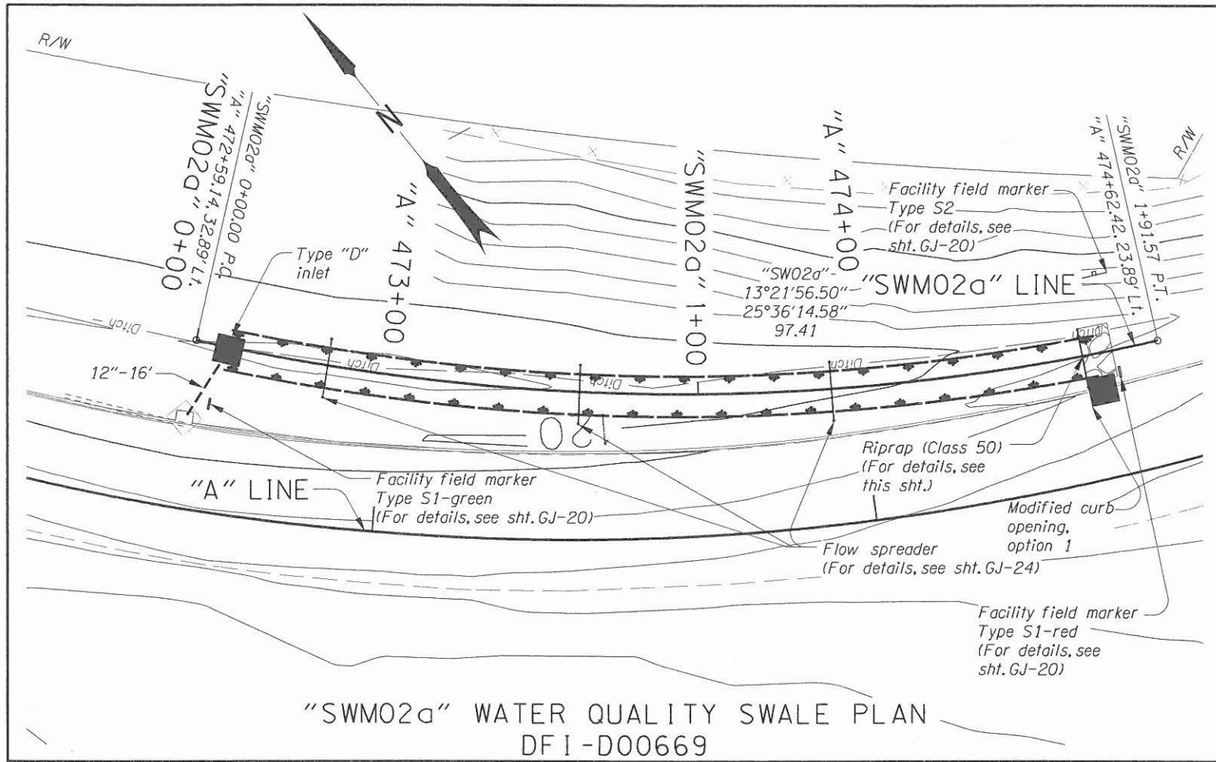
Design Team Leader - Tom Metcalf
Designed By - Ben Wewerka/Amy Jones
Drafted By - Serban Dinca/Brittney Zornado

DRAINAGE & UTILITIES NOTES

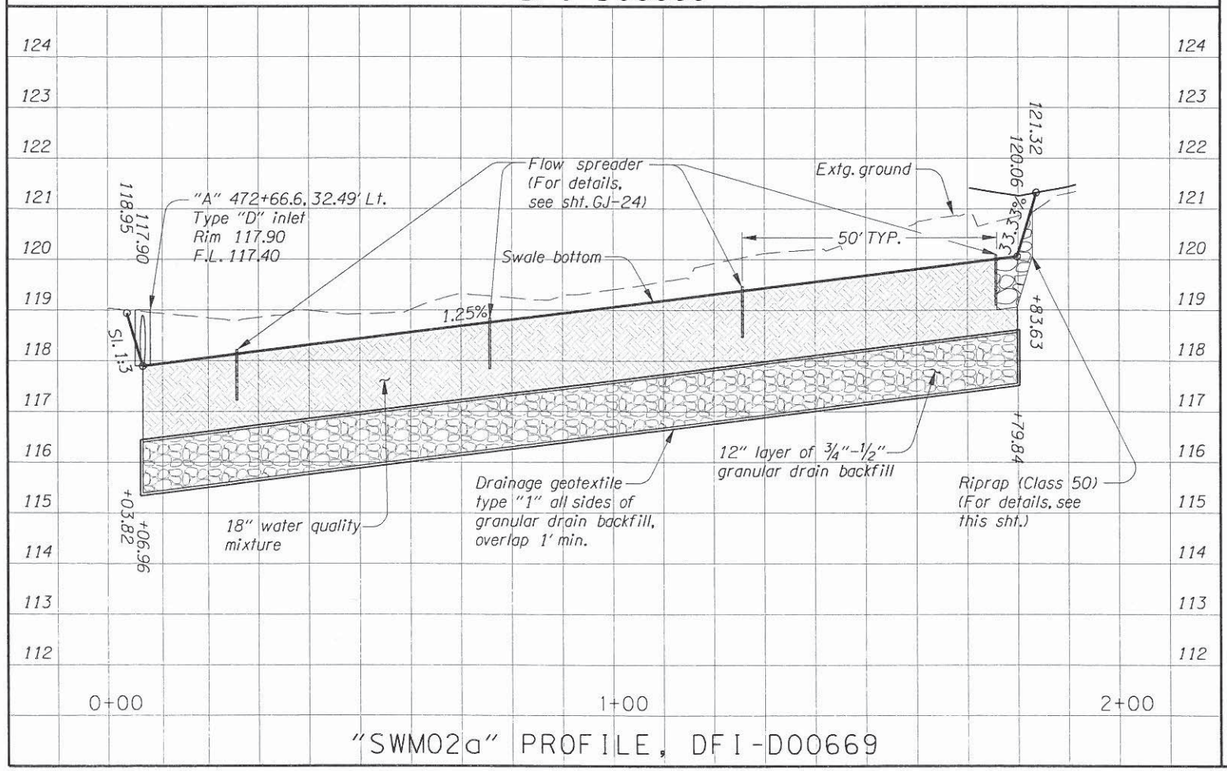
SHEET NO. 3E

File No.

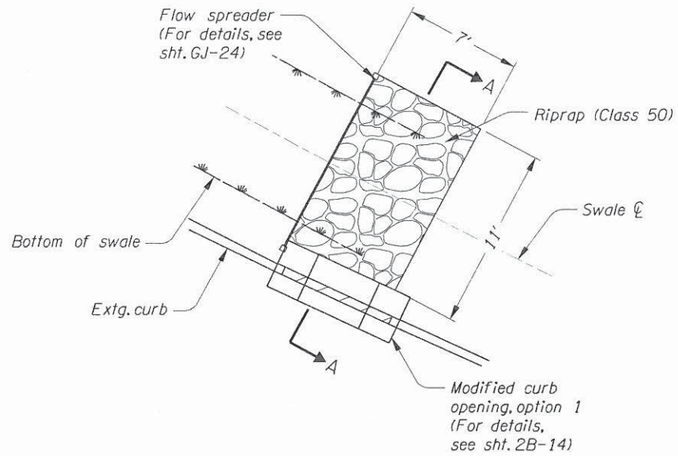
46V-022

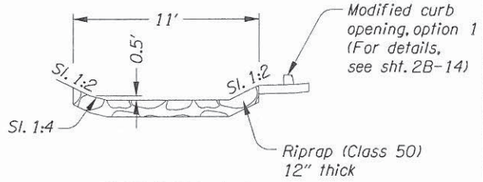


"SWMO2a" WATER QUALITY SWALE PLAN
DFI-D00669



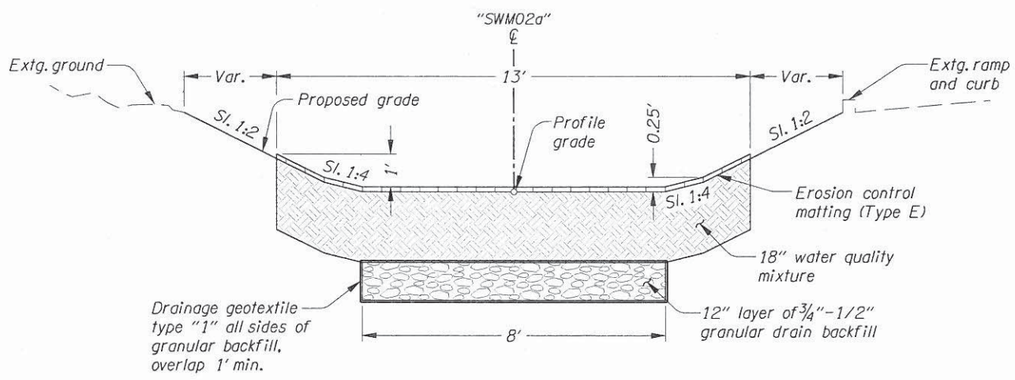
"SWMO2a" PROFILE, DFI-D00669





SECTION A-A

RIPRAP DETAIL



"SWMO2a" WATER QUALITY SWALE TYPICAL SECTION
DFI-D00669

REGISTERED PROFESSIONAL ENGINEER
64362
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

STORMWATER DETAILS

SHEET NO. GJ-5B

File No.