OPERATION & MAINTENANCE MANUAL

Detention Pond/Water Quality Biofiltration

Swale Combo

Manual prepared: May 2019

DFI No. D00644

Figure 1: DFI No. D00644, looking North on WB Hillsboro-Silverton Hwy

1. Identification

Drainage Facility ID (DFI):	D00644
Facility Type:	Water Qualiy Pond/Swale Combo
Construction Drawings:	(V-File Numbers) 46V-51
Location:	District: 3
	Highway No.: 140
	Mile Post: 37.35 to 37.39, [left]

2. Manual Purpose

The purpose of this manual is to outline inspection needs and summarize maintenance actions for stormwater ponds.

3. Facility Location

The location map below details the facility location. The highway, mile posts, side streets, access location, and stormwater flow directions are noted on the map.

Facility location type: Roadway shoulder

Flow direction: Southwest

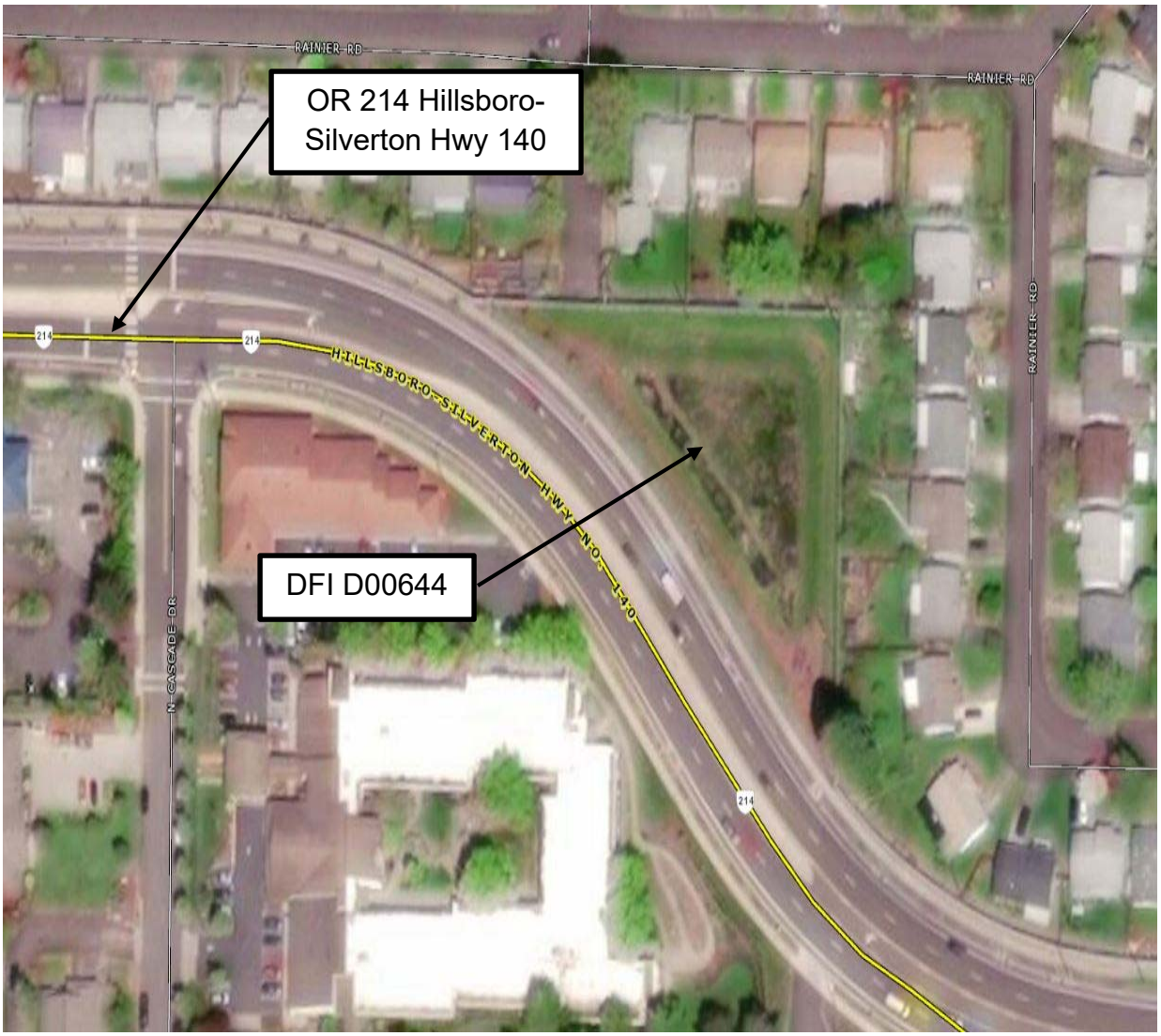


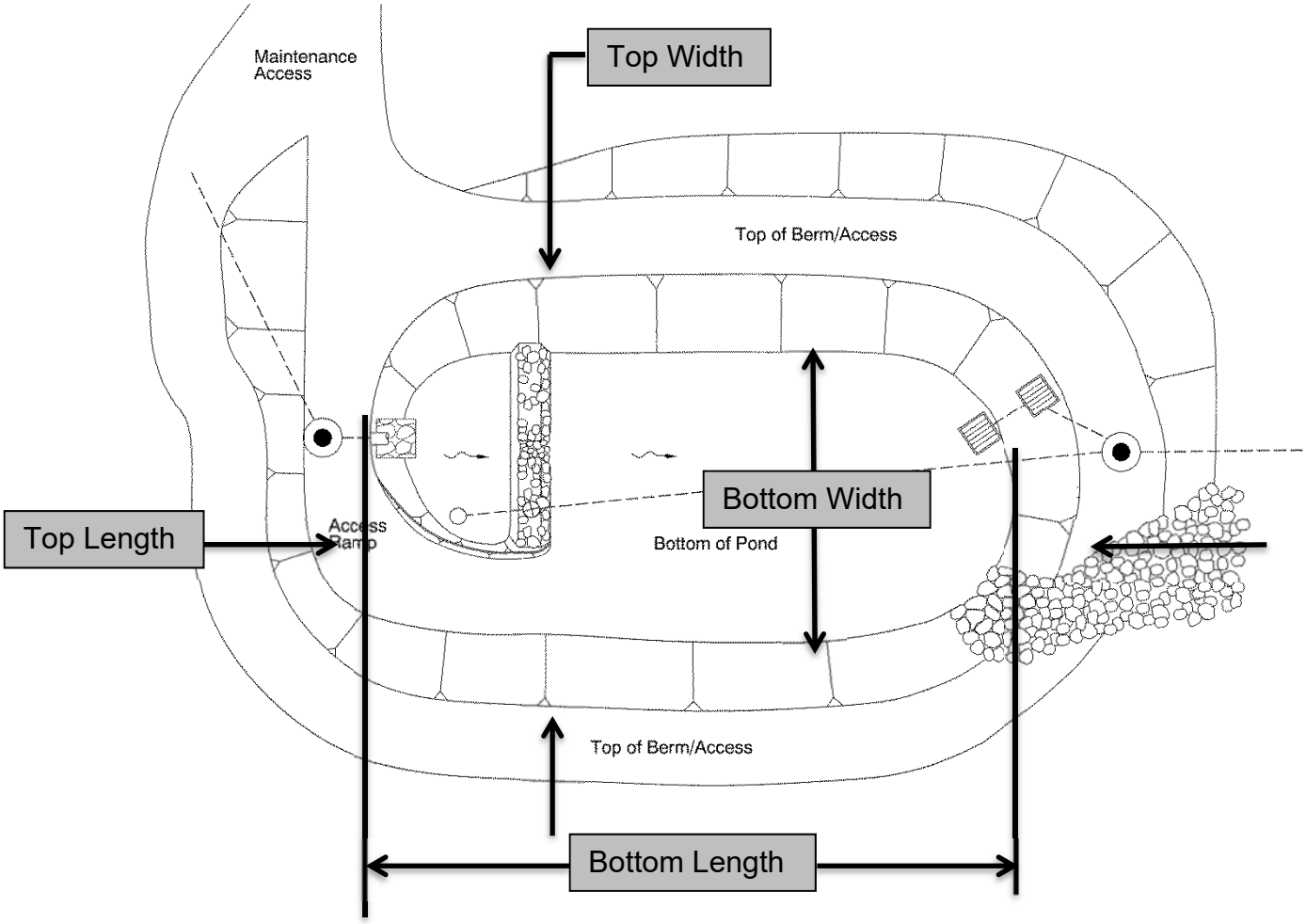
Figure 2: location map

4. Facility Summary

The pond size is based on storage volume, the bottom and top surface areas and the depth are used for this measurement.

The bottom area and top area of the pond is:

Bottom Area (sq. ft.)	Top Area (sq. ft.)
10,200	14,500

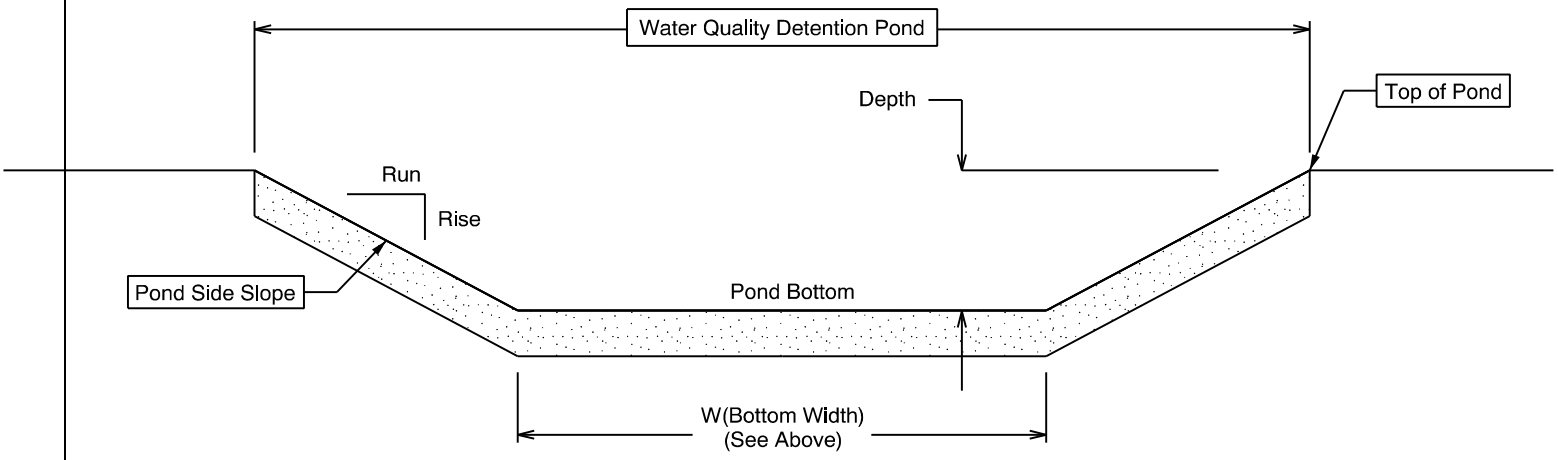


The depth of the pond is the vertical distance measured from the bottom of the pond to the top. The slope of the pond sides is presented by a vertical distance (rise) followed by the horizontal distance (run).

Depth and side slopes:

Depth (feet)
4

Side Slope	
Rise (feet)	**1**
Run (feet)	**4**



Site Specific Information: Only street run off from the inlet on the Hillsboro – Silverton Hwy get treated. The inlets behind the sound wall bypass the water quality treatment.

5. Facility Access

Maintenance access to the facility:

☐Roadside pad	☒Roadside shoulder
☐Access road with Gate	☒Access road without Gate

Figure 3: DFI D00644 (looking North on WB Hillsboro-Silverton Hwy)

6. Operational Components / Maintenance Items

Classification and Standard Operational (Op) Plan:

This facility is classified as a:

☐ Detention Pond (Op Plan A)	☐ WQ Bioretention Pond (Op Plan B)	☐ WQ Extended Detention Dry Pond (Op Plan C)	☒ WQ Detention Pond/Biofiltration Swale Combo (Op Plan D)
A standard operational plan illustrates the general facility footprint configuration and explains the purpose of each facility component. Operational plans (A,B,C,D) are provided in the Standard Operation Manual.			

See Appendix A for the site specific operational plan.

Key Features/Items:

This facility is classified as a:

☒ Dry Pond	☐ Wet Pond
The pond is wet during storm events and dries during periods of no precipitation.	The pond has constant presence of water year round. A portion of the pond dries during periods of no precipitation.

This facility includes a **high flow bypass component**:

☐ No	☒ Yes
There is no bypass component. High flows drains into and through the facility	There is a bypass component. Only low/small flows drain into the pond. High flows are diverted around the pond using a bypass component

This facility includes a **proprietary structure(s)**:

☒ No	☐ Yes (DXXXXX)
There are no proprietary structures associated with this facility.	A proprietary structure is used in the operation of this facility. The proprietary structure is a/an: describe

Operational Components

The facility components table (**Table 1**) has been provided to highlight the applicable components for this facility. The component is in use when the box contains an "x" (e.g. ☒).

The Standard Operation Manual for Ponds outlines facility operation, typical footprint configuration, and component definitions and details. A link to the manual is attached to the feature marker in TransGIS.
https://gis.odot.state.or.us/TransGIS/

Maintenance Items

Operational components marked in **Table 1** should be inspected and maintained according to Section 7. Each facility component is defined and detailed in the Standard Operation Manual using the associated ID number indicated in the table below.

Table 1: Stormwater Pond Components		ID #
Upstream Manholes/Structures		
Pre-treatment Manhole Type:	☐	**P1**
Water Quality Manhole Type:	☐	**P2**
Flow Splitter Manhole	☐	**P3**
Standard Manhole	☒	**P4**
Sediment Basin/Forebay	☐	**P5**
Forebay Dewatering Riser Pipe (outlet)	☐	**P6**
Facility Inlet		
Pavement Sheet Flow	☒	**P7**
Inlet Pipe(s)	☒	**P8**
Open Channel Inlet	☐	**P9**
Riprap Pad (Energy Dissipater)	☐	**P10**
Ground Cover		
Grass Bottom	☒	**P11**
Grass Side Slopes	☒	**P12**
Granular Drain Rock	☐	**P13**
Plantings	☐	**P14**
Underground Components		
Geotextile Fabric:	☐	**P15**
Impermeable Liner	☐	**P16**
Water Quality Mix	☒	**P17**
Perforated Pipe	☐	**P18**
Bottom Marker (ex. Porous Pavers)	☐	**P19**

Flow Spreader		
Anchored Board (midpoint of pond or every 50 feet along pond bottom)	☐	**P20**
Other:	☐	**P21**
Facility Outlet		
Catch Basin with Grate	☐	**P22**
Outlet Pipe(s)	☒	**P23**
Outlet/Flow Control Structure	☐	**P24**
Auxiliary Outlet: Weir outlet structure	☒	**P25**
Hazmat Control Valve:	☐	**P26**
Outfall Type		
Waterbody (**C**reek/**L**ake/**O**cean)	☐ **C** ☐ **L** ☐ **O**	**P27**
Ditch	☐	**P28**
Storm Drain System	☒	**P29**
Outfall Components		
Riprap Pad	☐	**P30**
Riprap Bank Protection	☐	**P31**

7. Maintenance

Maintenance Frequency/Maintain Records

a. Inspect annually. Preferably prior to the rainy season.
b. Clean and maintain as necessary. Refer to Activity 125 in the Maintenance Guide for conditions when maintenance is needed.
c. Keep a record of inspections, maintenance, and repairs.

Maintenance Guide/Maintenance Actions

The Maintenance Guide outlines the standard maintenance actions for water quality facilities under Activity 125.

There are standard maintenance tables for standard ODOT designs. The maintenance tables describe the maintenance component, the defect or problem, the condition when maintenance is needed, and the recommended maintenance to correct the problem. Use the following tables to maintain ODOT Ponds:

- Table 1 (General Maintenance): Contains general maintenance and inspection guidelines that are applicable to all ODOT water quality facilities
- Table 2 (Maintenance of Stormwater Ponds): Contains maintenance information for ponds

The ODOT Maintenance Guide can be viewed at the following website:
http://www.oregon.gov/ODOT/HWY/OOM/pages/mguide.aspx

The Blue Book can be viewed at the following website:
http://www.oregon.gov/ODOT/Maintenance/Documents/blue_book.pdf

8. Limitations

There are access limitations for this facility:

☒ No	☐ Yes
There are no porous pavers installed in this pond.	

Ponds are designed to allow equipment access along the bottom if an access grid is installed. If an access grid is NOT installed, vehicles entering the pond can create depressions (tire ruts), damage vegetation, or damage structural components (e.g. flow spreaders). These conditions may result in poor treatment and drainage performance.

If no access grid then: Equipment wheels should be kept on the tops and side slopes. Mower arms may be run along the pond bottom.

9. Waste Material Handling

Material removed from the facility is defined as waste by the Department of Environmental Quality (DEQ). Refer to the road waste section of the ODOT Maintenance Yard Environmental Management System (EMS) Policy and Procedures Manual for disposal options:

http://www.oregon.gov/ODOT/HWY/OOM/pages/ems.aspx

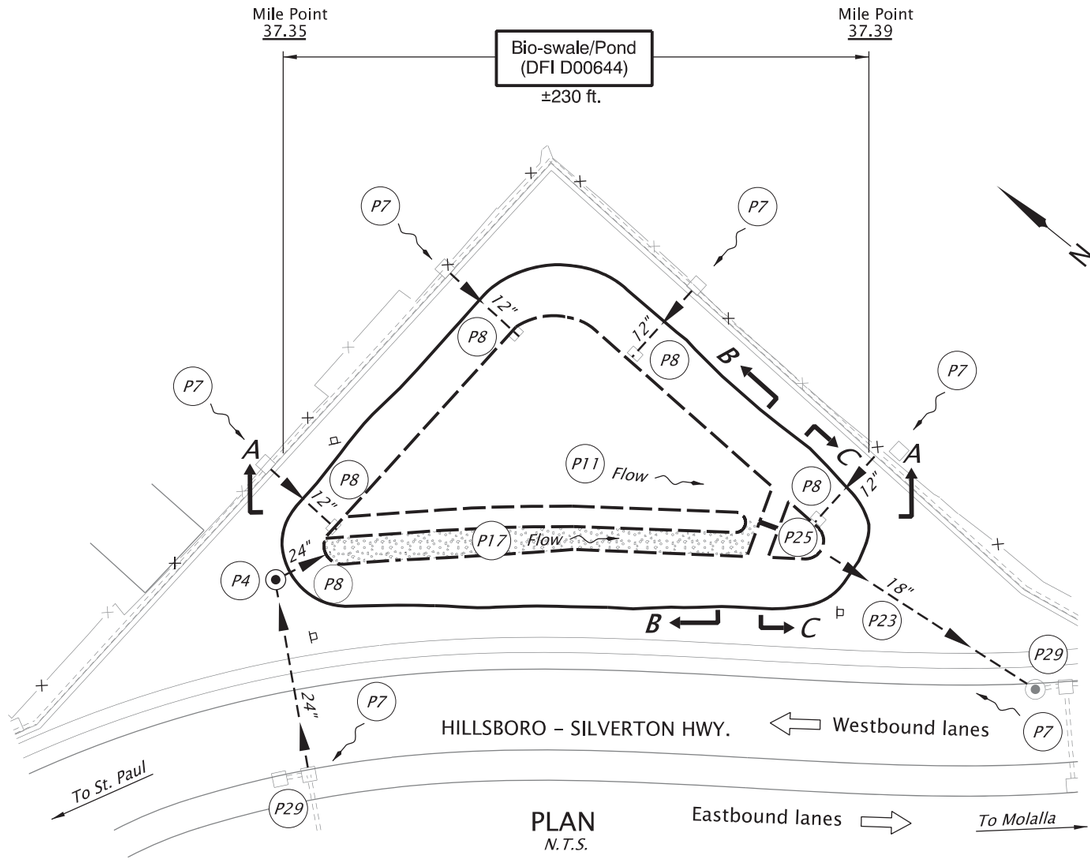
Contact any of the following for more detailed information about management of waste materials found on site:

ODOT Clean Water Unit	(503) 986-3008
ODOT Statewide Hazmat Coordinator	(503) 667-7442
ODOT Region 1 Hazmat Coordinator	(503) 731-8290
ODOT Region 2 Hazmat Coordinator	(503) 986-2647
ODOT Region 3 Hazmat Coordinator	(541) 957-3594
ODOT Region 4 Hazmat Coordinator	(541) 388-6186
ODOT Region 5 Hazmat Coordinator	(541) 963-1590
ODEQ Northwest Region Office	(503) 229-5263

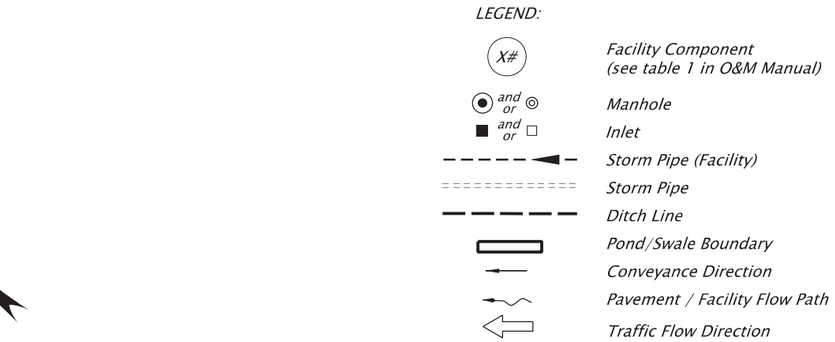
A Appendix A – Site Specific Operational Plan

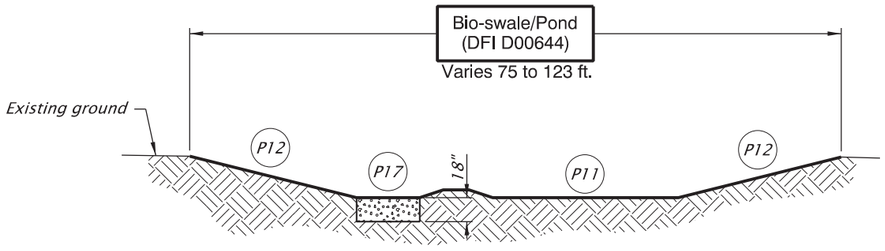
Contents:

Operational Plan: DFI D00644

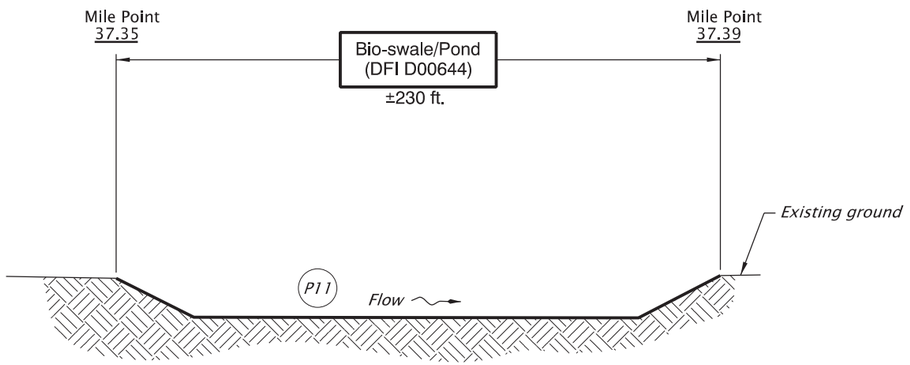


PLAN
N.T.S.

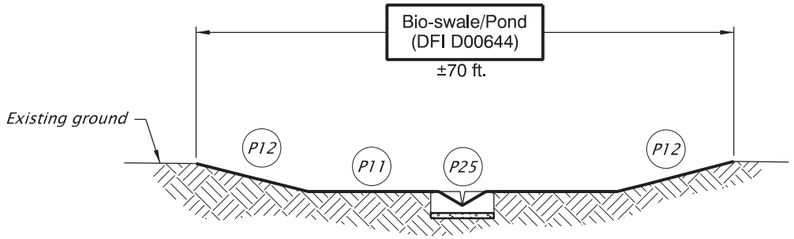




SECTION B-B
N.T.S.



SECTION A-A
N.T.S.



SECTION C-C
N.T.S.

OREGON DEPARTMENT OF TRANSPORTATION

Prepared By: Ramiro Perez

Drafted By: Jeff Coon

DFI D00644
MAINTENANCE DISTRICT 3 I-5 @ OR214
BIO-SWALE & DETENTION POND
HILLSBORO-SILVERTON HIGHWAY MP 37.35
MARION COUNTY

DFI_00644.dgn :: Default 5/28/2019 10:03:09 AM hwyr64u

Rotation: 0° Scale: 1"=30'

B Appendix B – Project Contract Plans

Contents:

Site Specific Subset of Project Contract Plan 46V-51

[14575] 14581 Contract Plans

46V-51

INDEX OF SHEETS	
SHEET NO.	DESCRIPTION
1	Title Sheet
1A	Index Of Sheets Contd.
1A-2	Index Of Sheets Contd.
1A-3	Standard Drg. Nos.

STATE OF OREGON
DEPARTMENT OF TRANSPORTATION
PLANS FOR PROPOSED PROJECT

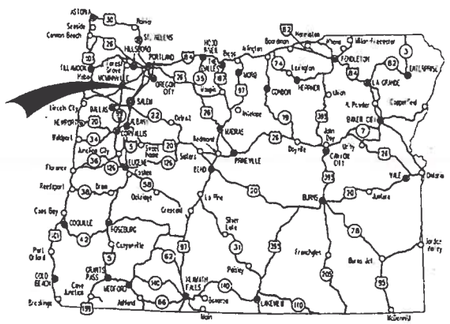
GRADING, DRAINAGE, STRUCTURES, PAVING, SIGNING, ILLUMINATION, SIGNAL & ROADSIDE DEVELOPMENT

FFO - I-5 @ OR214 INTERCHANGE (WOODBURN) DEVELOPMENT SEC.

HILLSBORO - SILVERTON HIGHWAY

MARION COUNTY

⑥ JUNE 2013



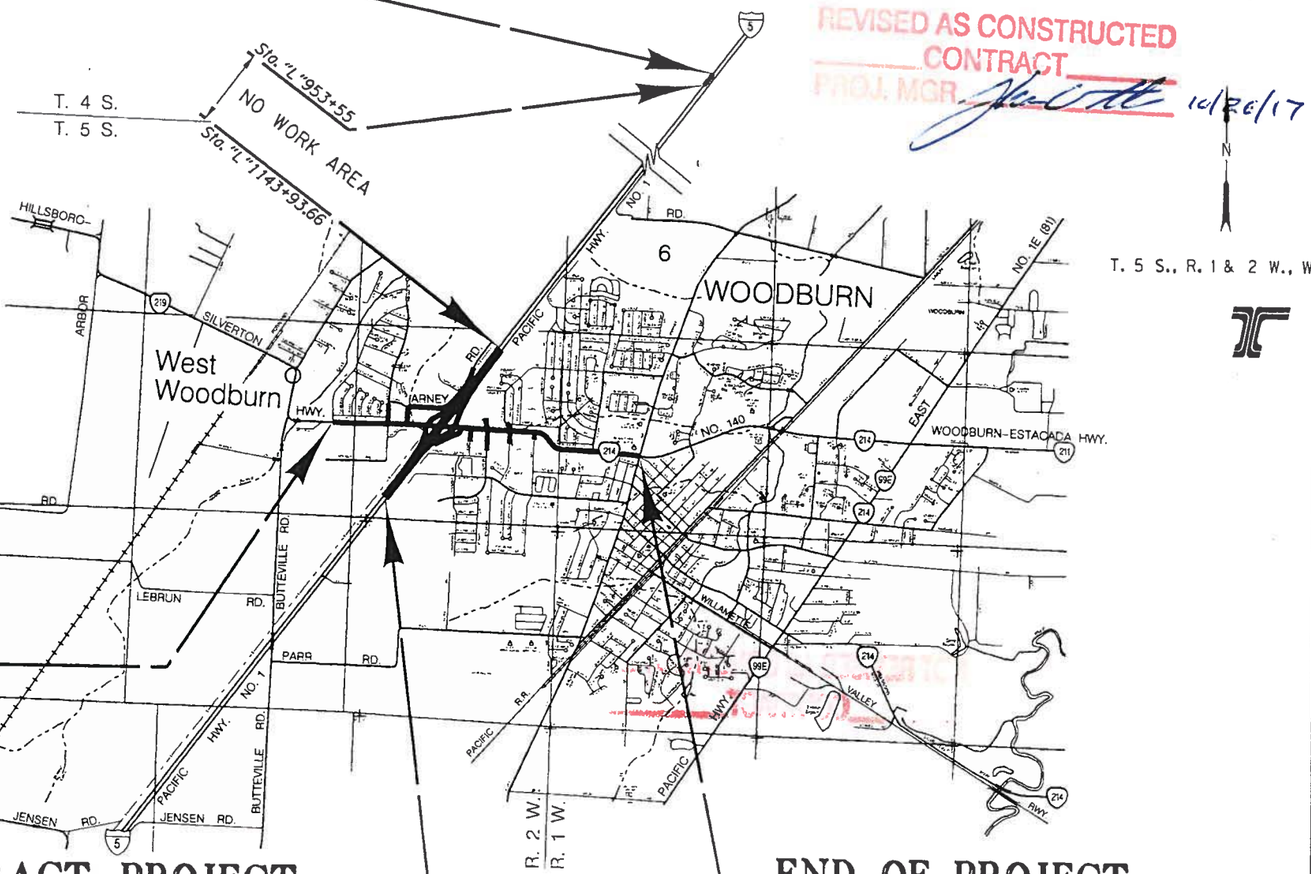
Overall Length Of Project - 2.76 Miles

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. (Notes The Telephone Number For The Oregon Utility Center Is (503) 232-1987.)

REVISED AS CONSTRUCTED
CONTRACT
PROJ. MGR. 10/26/17

No.	DATE	REVISIONS	BY
①	4-18-13	Edited station & MP for the end of contract	J.O.L.
⑥	5-16-13	Changed date	C.A.C.

BEGINNING OF CONTRACT PROJECT
STP-S140(045)
STA. "L"952+05 (M.P. 276.01)



T. 5 S., R. 1 & 2 W., W.M.

BEGINNING OF PROJECT
STP-S140(045)
STA. "HSc"477+21
(M.P. 36.24)

END OF CONTRACT PROJECT
STP-S140(045)
① **STA. "L"1199+66.06 (M.P. 271.35)**

END OF PROJECT
STP-S140(045)
STA. "HSc"562+67.5 (M.P. 37.87)

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

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.

By: 5-20-13
Signature & date

Michael T. Long - R2 Tech Center Manager
Print name and title

Concurrence by ODOT Chief Engineer

FFO - I-5 @ OR214 INTERCHANGE (WOODBURN) DEVELOPMENT SEC.
HILLSBORO - SILVERTON HIGHWAY
MARION COUNTY

FEDERAL HIGHWAY ADMINISTRATION	PROJECT NUMBER	SHEET NO.
OREGON DIVISION	STP-S140(045)	1

PE00 0559 010

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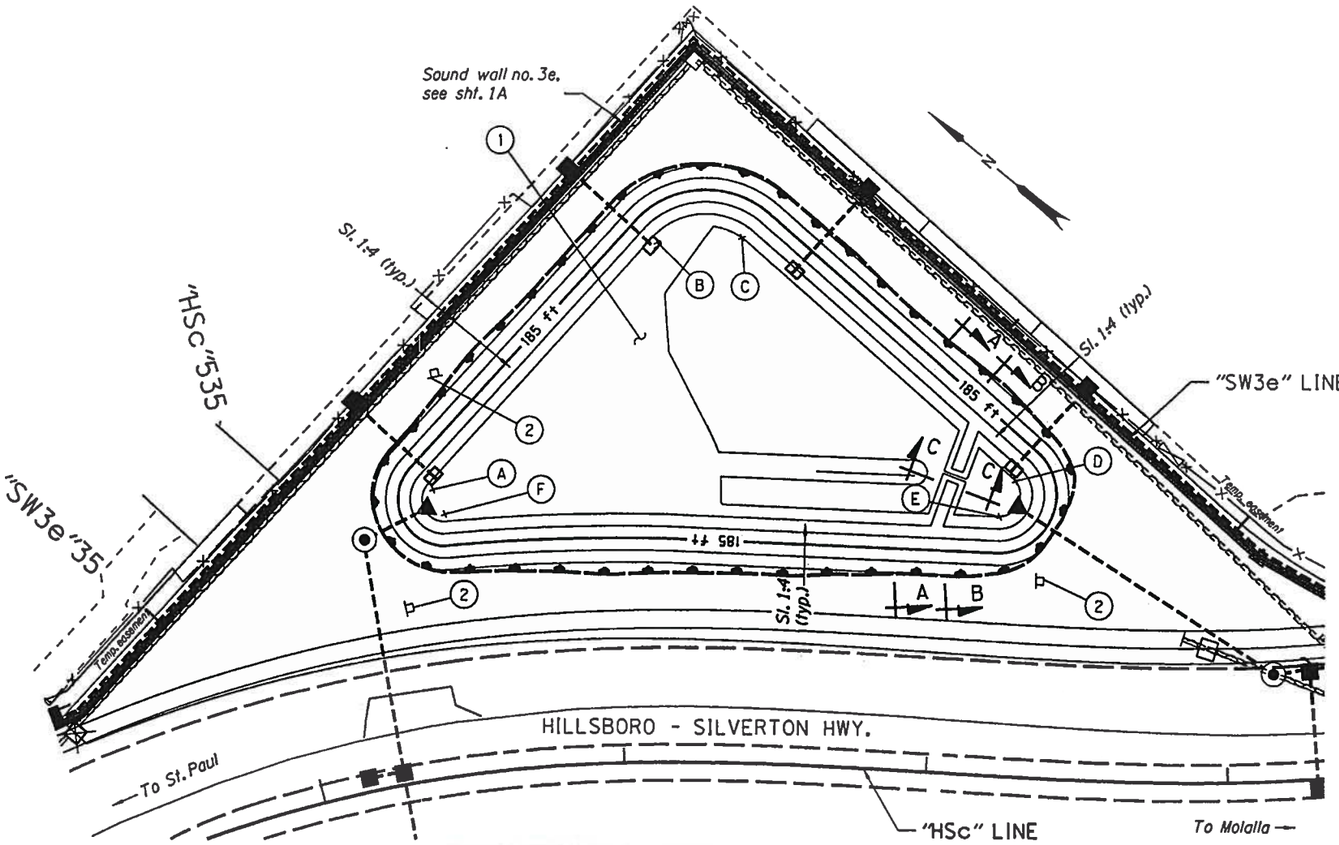
1/972 BL - 001



PLAN

(1) Sta. "Hsc" 535+33 lt. to Sta. "Hsc" 537+41 lt.
Const. stormwater storage pond no. 00644
Water quality mixture - 100 cu. yd.
Gen. exc. - 3,000 cu. yd.

(2) Stormwater facility marker
(See "Pond No. 00644 Marker Table")
(See dwg. RD399)

POND NO. 00644 MARKER TABLE

TYPE				LOCATION	
S1	S2	RED	GREEN	NORTHING	EASTING
	✓			550131.35	7591868.86
✓		✓		550088.17	7591803.65
✓			✓	549933.09	7591943.16

ELEVATION TABLE

	NORTHING	EASTING	ELEVATION (Ft.)
A	550107.26	7591838.81	182.4
B	550101.71	7591949.21	182.4
C	550081.07	7591968.20	182.0
D	549960.23	7591963.48	182.0
E	549956.90	7591951.10	182.0
F	550099.13	7591835.03	182.4

NOT REVISED AS CONSTRUCTED
CONTRACT

NOTES:
Slopes are shown as vertical to horizontal.

For Sections A-A, B-B and C-C, see sht. GJ-5.

REGISTERED PROFESSIONAL ENGINEER
17807
OREGON
JULY 25, 1995
CHRIS CARMAN
RENEWS: 12-31-2013

OREGON DEPARTMENT OF TRANSPORTATION

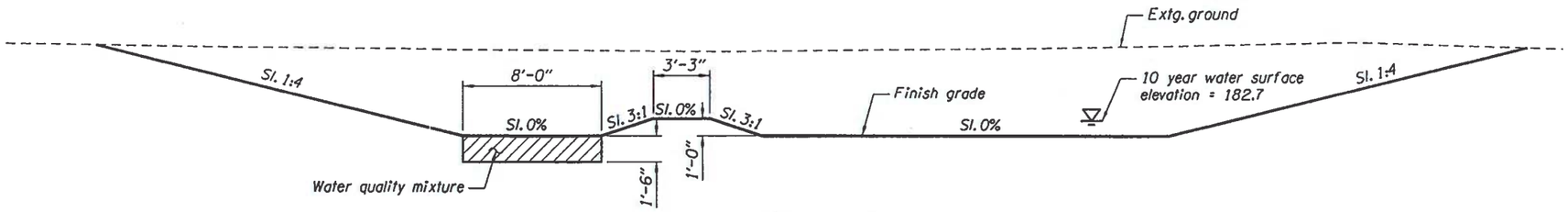
REGION 2 TECH CENTER

FFO - I-5 @ OR214 INTERCHANGE
(WOODBURN) DEVELOPMENT SEC.
HILLSBORO - SILVERTON HIGHWAY
MARION COUNTY

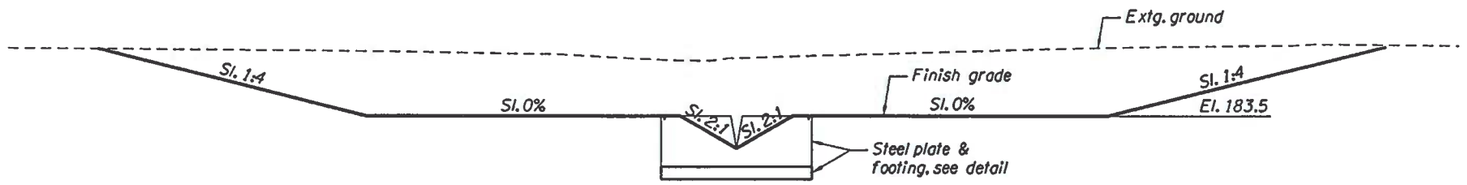
Reviewed By - Bruce Carmichael
Designed By - Jamie Schmidt
Drafted By - Sandra Gish

STORMWATER STORAGE POND NO. 00644 PLAN

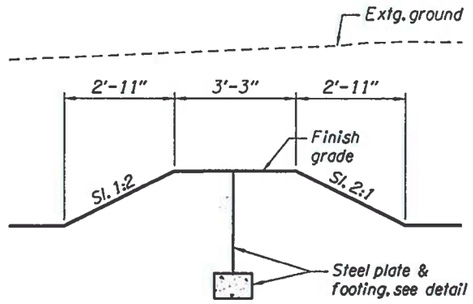
SHEET NO. GJ-4



SECTION A-A



SECTION B-B



SECTION C-C

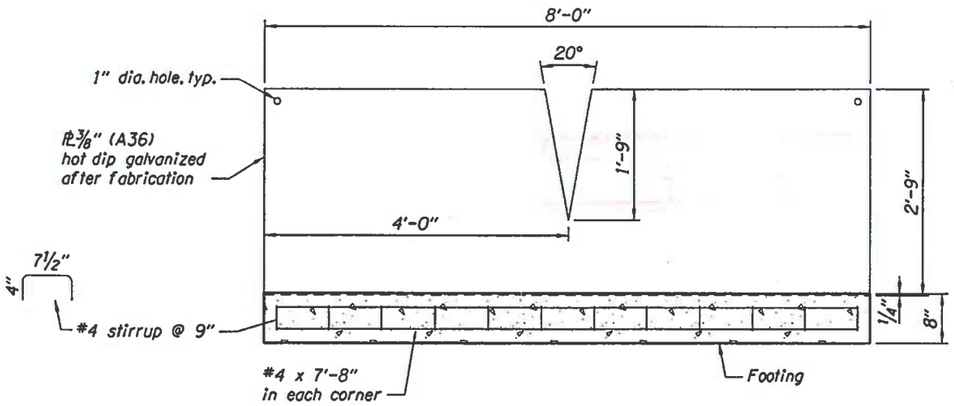
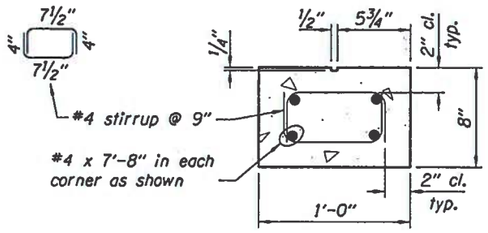


PLATE & FOOTING DETAIL



FOOTING TYPICAL SECTION

NOT REVISED AS CONSTRUCTED CONTRACT

NOTES:
Slopes are shown as vertical to horizontal.

For Sections A-A, B-B and C-C locations, see sht. GJ-4.

REGISTERED PROFESSIONAL ENGINEER
17807
OREGON
JULY 25, 1995
CHRIS CARMAN
RENEWS: 12-31-2013

OREGON DEPARTMENT OF TRANSPORTATION

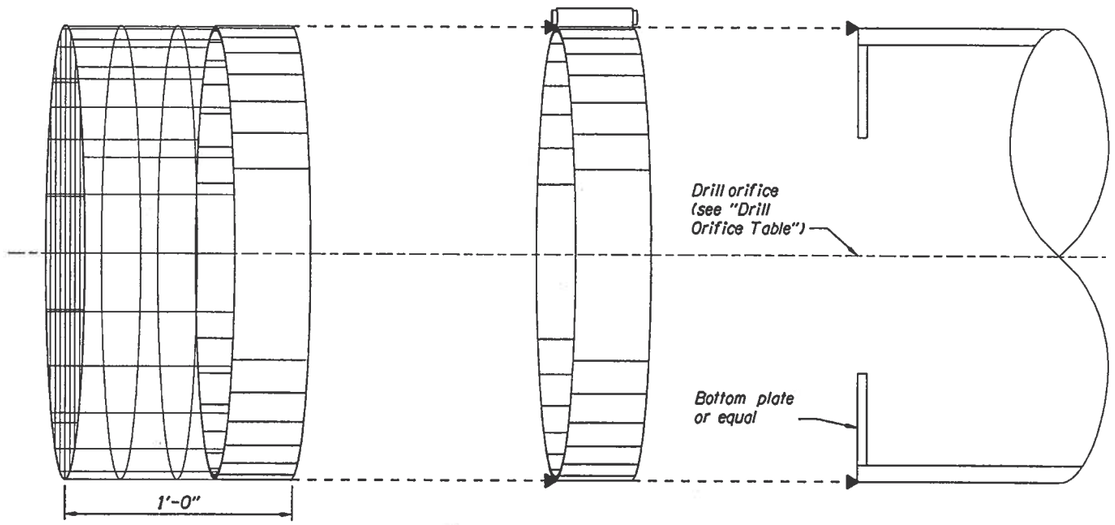
REGION 2 TECH CENTER

FFO - I-5 @ OR214 INTERCHANGE
(WOODBURN) DEVELOPMENT SEC.
HILLSBORO - SILVERTON HIGHWAY
MARION COUNTY

Reviewed By - Bruce Carmichael
Designed By - Chris Carman
Drafted By - Sandra Gish

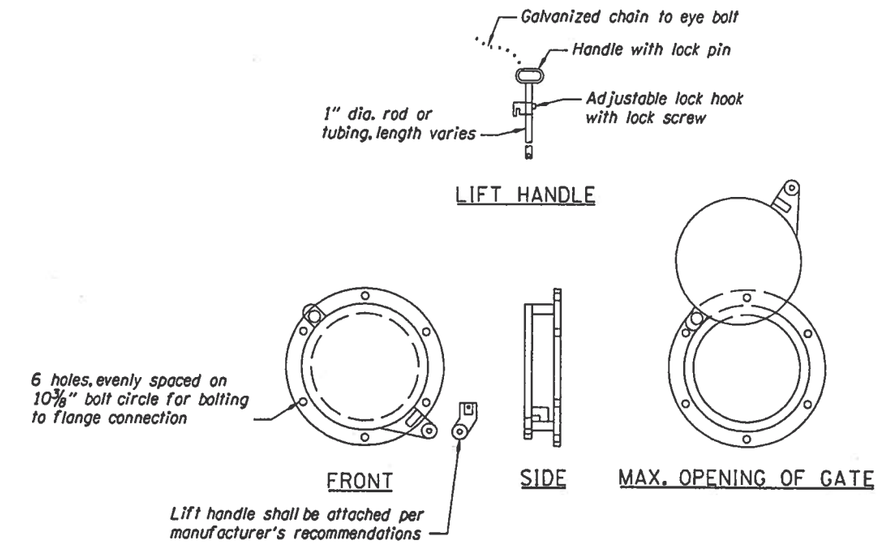
STORMWATER STORAGE POND NO. 00644 DETAILS

SHEET NO. GJ-5



FLOW CONTROL MANHOLE

FLOW CONTROL MANHOLE
WIRE STRAINER ASSEMBLY



CLEANOUT/SHEAR GATE DETAILS

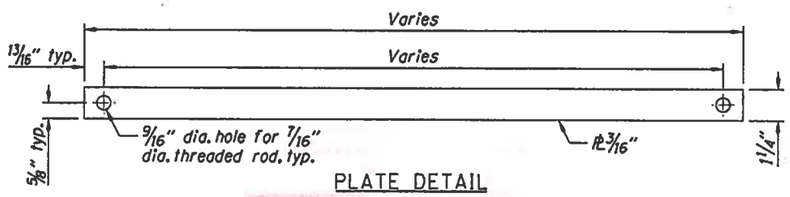
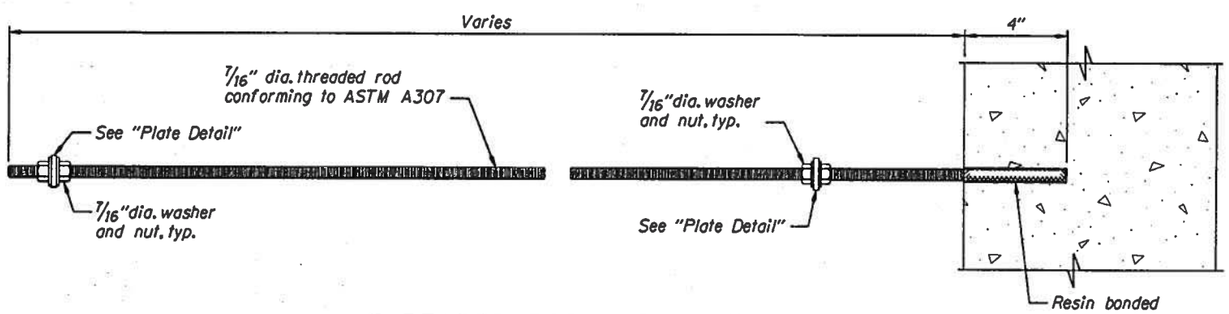


PLATE DETAIL



THREADED ROD AND PLATE DETAILS

DRILL ORIFICE TABLE

STATION	OFFSET (Ft.)	DIAMETER (In.)
"D2"67+46.00	33.22 lt.	10 1/2
"HSc"479+85.98	58.63 rt.	3 1/2

CLEANOUT/SHEAR GATE NOTES:
Cleanout/shear gate shall be aluminum alloy per ASTM B-26-2C-32.

Lift handle either solid or tubing with adjustable hook as required.

Neoprene rubber gasket required between riser mounting flange and gate flange.

Mating surfaces of lid and body to be machined for proper fit.

Flange mounting bolts shall be 3/8" diameter stainless steel.

Gate shall not open beyond the clear opening by limited hinge movement, stop pad, or some other device.

NOT REVISED AS CONSTRUCTED
CONTRACT

REGISTERED PROFESSIONAL ENGINEER
1780
OREGON
JULY 25, 1995
CHRIS CARMAN
RENEWS: 12-31-2013

OREGON DEPARTMENT OF TRANSPORTATION

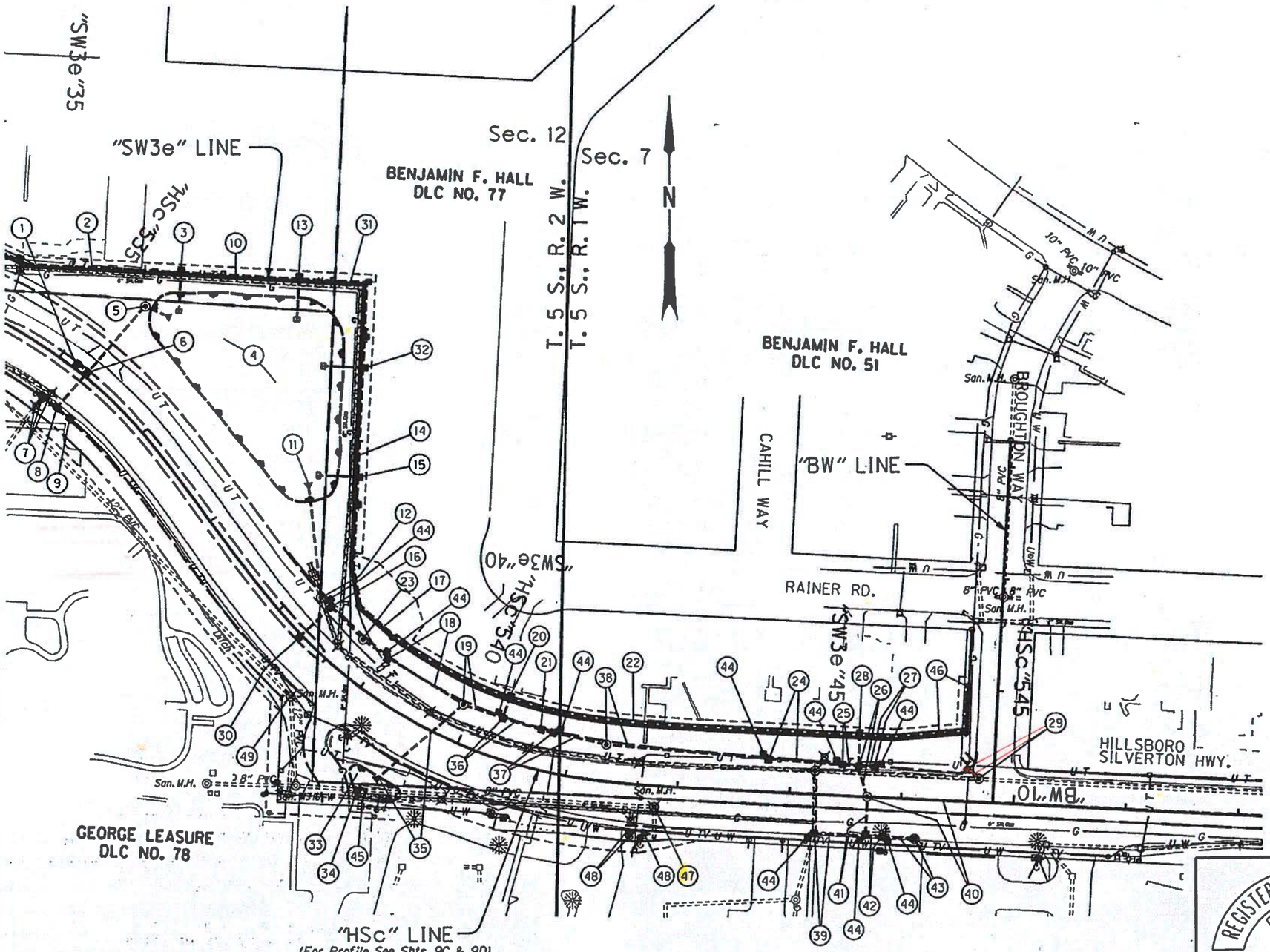
REGION 2 TECH CENTER

FFO - I-5 @ OR214 INTERCHANGE
(WOODBURN) DEVELOPMENT SEC.
HILLSBORO - SILVERTON HIGHWAY
MARION COUNTY

Reviewed By - Bruce Carmichael
Designed By - Chris Carman
Drafted By - Sandra Gish

STORMWATER STORAGE POND DETAILS

SHEET NO.
GJ-8



REVISED AS CONSTRUCTED
CONTRACT

Plug and abandon extg. pipe shown thus:
Remove extg. inlet shown thus:
Remove extg. manhole shown thus:

REGISTERED PROFESSIONAL ENGINEER
14,931
Carol A. Cartwright
OREGON
JULY 25, 1990
CAROL A. CARTWRIGHT
RENEWS: 12-31-2013

OREGON DEPARTMENT OF TRANSPORTATION

REGION 2 TECH CENTER

FFO - I-5 @ OR214 INTERCHANGE (WOODBURN) DEVELOPMENT SEC.
HILLSBORO - SILVERTON HIGHWAY
MARION COUNTY

Design Team Leader - Carol Cartwright
Designed By - John Lucas
Drafted By - Charlotte Gerken

DRAINAGE & UTILITIES

SHEET NO. 9B

46V-51

(1) See sht. 8B-2, note 25
Const. inlet
Inst. pipe

(2) See sht. 8B-2, note 23
Inst. subsurface drain

(3) See sht. 8B-2, note 28
Inst. pipe

(4) Sta. "HSc"535+50.2 to Sta. "HSc"537+24, Lt.
Const. stormwater control pond no. 00644
(For details, see shts. GJ-4 & GJ-5)

(5) See sht. 8B-2, note 26
Const. manhole
Inst. pipe
Const. paved end slope

(6) See sht. 8B-2, note 29
Const. inlet
Inst. pipe

(7) See sht. 8B-3, note 52
Const. inlet
Inst. pipe

(8) See sht. 8B-3, note 53
Const. inlet
Inst. pipe

(9) See sht. 8B-3, note 54
Const. inlet
Inst. pipe

(10) Sta. "SW3e"35+97 to Sta. "SW3e"37+02
Inst. 6" subsurface drain - 106'
Connect to area drainage basins
Drainage geotextile type "1" - 90 sq. yd.

(11) Sta. "HSc"537+24 to Sta. "HSc"538+16.9, Lt.
Inst. 24" storm sew. pipe - 103'
5' depth
Const. paved end slope, Lt.
(For details, see sht. GJ-4)

(12) Sta. "HSc"538+16.9 to Sta. "HSc"538+30, Lt.
Const. manhole
Step orientation - 112°
~~Minor adjust manhole~~
Inst. 24" storm sew. pipe - 12'
5' depth

(13) Sta. "SW3e"37+02
Const. 12" area drainage basin
Inst. 8" storm sew. pipe - 40'
5' depth
Const. outlet protection block - 1
(For details, see sht. 2B-10)

(14) Sta. "SW3e"38+34 to Sta. "SW3e"39+32
Inst. 6" subsurface drain - 99'
Connect to area drainage basins
Drainage geotextile type "1" - 92 sq. yd.

(15) Sta. "SW3e"39+32
Const. 12" area drainage basin
Inst. 8" storm sew. pipe - ~~35~~ 40'
5' depth
Const. outlet protection block - 1
(For details, see sht. 2B-10)

(16) Sta. "HSc"538+30 to Sta. "HSc"538+74.1, Lt.
Const. type "CG-2" Mod. inlet
Adjust inlet
Inst. 24" storm sew. pipe - 41'
5' depth
(For details, see sht. 2B-15)

(17) Sta. "SW3e"39+32 to Sta. "HSc"540+30.2, Lt.
Inst. 6" subsurface drain - 275'
Connect to area drainage basins
Drainage geotextile type "1" - 245 sq. yd.

(18) Sta. "HSc"539+05 to Sta. "HSc"539+90.1, Lt.
Const. type "CG-2" Mod. inlet
Adjust inlet
Inst. 24" storm sew. pipe - 78'
5' depth
(For details, see sht. 2B-15)

(19) Sta. "HSc"539+90.1 to Sta. "HSc"540+30, Lt.
Const. manhole
Step orientation - 274°
~~Minor adjust manhole~~
Inst. 24" storm sew. pipe - 37'
5' depth

(20) Sta. "HSc"540+30.1, Lt.
Const. 12" area drainage basin
Inst. 8" storm sew. pipe - 20'
5' depth
(For details, see sht. 2B-10)

(21) Sta. "HSc"540+69.3 to Sta. "HSc"540+81.4, Lt.
Const. type "CG-2" inlet
Adjust inlet
Inst. 24" storm sew. pipe - ~~10~~ 11'
5' depth
(For details, see sht. 2B-15)

(22) Sta. "HSc"540+30.1 to Sta. "HSc"543+60.3, Lt.
Inst. 6" subsurface drain - 316'
Connect to area drainage basins
Drainage geotextile type "1" - 292 sq. yd.

(23) Sta. "HSc"538+74.1 to Sta. "HSc"539+05, Lt.
Const. manhole
Step orientation - 275°
~~Minor adjust manhole~~
Inst. 21" storm sew. pipe - 28'
5' depth

(24) Sta. "HSc"542+80 to Sta. "HSc"543+45.8, Lt.
Const. type "CG-2" Mod. inlet
Adjust inlet
Inst. 24" storm sew. pipe - 66'
5' depth
(For details, see sht. 2B-15)

(25) Sta. "HSc"543+45.8 to Sta. "HSc"543+60.8, Lt.
Const. type "CG-2" Mod. inlet
Adjust inlet
Inst. 24" storm sew. pipe - ~~12~~ 15'
5' depth
(For details, see sht. 2B-15)

(26) Sta. "HSc"543+60.8 to Sta. "HSc"543+70.1, Lt.
Const. type "CG-2" inlet
Adjust inlet
Inst. 24" storm sew. pipe - ~~27~~ 29'
5' depth
(For details, see sht. 2B-15)

(27) Sta. "HSc"543+60.8 to Sta. "HSc"543+75.8, Lt.
Const. type "CG-2" Mod. inlet
Adjust inlet
Inst. 12" storm sew. pipe - ~~14~~ 15'
5' depth
(For details, see sht. 2B-15)

(28) Sta. "HSc"543+60.3 to Sta. "HSc"543+60.8, Lt.
Const. 12" area drainage basin
Inst. 8" storm sew. pipe - 29'
5' depth
(For details, see sht. 2B-10)

(29) Sta. "HSc"544+68.2, Lt.
Const. ~~shallow~~ manhole
Step orientation - 288°
Connect to extg. pipes
INST. 12" STORM SEW PIPE - 9'
CONST CG-2 INLET

(30) Sta. "HSc"538+30, Lt. & Rt.
Const. type "CG-3" inlet
Inst. 12" storm sew. pipe - ~~41~~ 42'
5' depth

(31) Sta. "SW3e"37+02 to Sta. "SW3e"38+34
Inst. 6" subsurface drain - 135'
Connect to area drainage basins
Drainage geotextile type "1" - 125 sq. yd.

(32) Sta. "SW3e"38+34.3
Const. 12" area drainage basin
Inst. 8" storm sew. pipe - 40'
5' depth
Const. outlet protection block - 1
(For details, see sht. 2B-10)

(33) Sta. "HSc"539+30 to Sta. "HSc"539+77, Rt.
Const. stormwater collection swale
Dt. exc. - 60 cu. yd.
(For details, see sht. 2B-11)

(34) Sta. "HSc"539+46 to Sta. "HSc"539+46.6, Rt.
Const. shallow manhole
Connect to extg. storm sew. pipe
Inst. 12" storm sew. pipe - ~~7~~ 8'
5' depth
Const. paved end slope, Rt.

(35) Sta. "HSc"539+53.1 to Sta. "HSc"539+90.1, Rt.
Inst. 12" storm sew. pipe - 104'
5' depth
Const. paved end slope, Rt.

(36) Sta. "HSc"540+30 to Sta. "HSc"540+69.3, Lt.
Const. type "CG-2" Mod. inlet
Adjust inlet
Inst. 24" storm sew. pipe - 36'
5' depth
(For details, see sht. 2B-15)

(37) Sta. "HSc"540+81.4 to Sta. "HSc"541+33, Lt.
Const. type "CG-2" Mod. inlet
Adjust inlet
Inst. 24" storm sew. pipe - ~~42~~ 48'
5' depth
(For details, see sht. 2B-15)

(38) Sta. "HSc"541+33 to Sta. "HSc"542+80, Lt.
Const. manhole
Step orientation - 274°
~~Minor adjust manhole~~
Inst. 24" storm sew. pipe - 145'
5' depth

(1) (39) Sta. "HSc"543+23.3 to Sta. "HSc"543+70, Rt.
Remove inlet
Const. type "CG-2" Mod. inlet
Adjust inlet
Connect to extg. storm sew. pipe
Inst. 12" storm sew. pipe - 47'
5' depth
(For details, see sht. 2B-15)

(40) Sta. "HSc"543+70 to Sta. "HSc"547+30.4
Const. manhole 60" dia.
Step orientation - 165°
Minor adjust manhole
Inst. ~~33~~ storm sew. pipe - 360'
10' depth 36"
Trench resurf. - 190 sq. yd.

(1) (41) Sta. "HSc"543+70, Rt.
Const. type "CG-2" Mod. inlet
Adjust inlet
Inst. 15" storm sew. pipe - 35'
5' depth
(For details, see sht. 2B-15)
INST. 6" STORM SEW PIPE - 10'

(1) (42) Sta. "HSc"543+70 to Sta. "HSc"543+85, Rt.
Const. type "CG-2" Mod. inlet
Adjust inlet
Inst. 12" storm sew. pipe - 15'
5' depth
(For details, see sht. 2B-15)
INST. 6" STORM SEW PIPE - 10'

(43) Sta. "HSc"543+85 to Sta. "HSc"544+13.7, Rt.
Const. manhole 24" dia.
Connect to extg. storm sew. pipe
Inst. 12" storm sew. pipe - 29'
5' depth

(44) Const. water quality structure - 10
Connect to inlet
(For details, see shts. GJ-10 & GJ-11)

(45) Sta. "HSc"539+53.1 to Sta. "HSc"539+50.4, Rt.
Inst. 4" storm sew. pipe - 17'
5' depth
Const. outlet protection block - 1
Connect to extg. storm sew. pipe

(46) Sta. "HSc"543+60.3 to Sta. "SW3e"46+62, Lt.
Inst. 6" subsurface drain - 139'
Connect to area drainage basin
Drainage geotextile type "1" - 128 sq. yd.

(1) (47) Minor adjust manhole
(For details, see sht. 2B-23)

(48) Adjust water valve box - 3
(For details, see sht. 2B-22)

(49) Sta. "HSc"538+59.8, Rt.
Major adjust manhole
(For details, see sht. 2B-23)

REVISED AS CONSTRUCTED
CONTRACT

No.	DATE	REVISIONS	BY
1	4-18-13	Edited text	J.O.L.

REGISTERED PROFESSIONAL ENGINEER
14,931
Carol A. Cartwright
OREGON
JULY 25, 1990
CAROL A. CARTWRIGHT
RENEWS: 12-31-2013

OREGON DEPARTMENT OF TRANSPORTATION

REGION 2 TECH CENTER

FFO - I-5 @ OR214 INTERCHANGE
(WOODBURN) DEVELOPMENT SEC.
HILLSBORO - SILVERTON HIGHWAY
MARION COUNTY

Design Team Leader - Carol Cartwright
Designed By - John Lucas
Drafted By - Charlotte Gerken

DRAINAGE NOTES

SHEET NO. 9B-2