OPERATION & MAINTENANCE MANUAL

Water Quality Biofiltration Swale

Manual prepared: March 2019

DFI No. D01225

Figure 1: DFI No. D01225, looking southeast

Identification

Drainage Facility ID (DFI):	D01225
Facility Type:	Water Quality Biofiltration Swale
Construction Drawings:	(V-File Numbers) 43V-121
Location:	District: 2B
	Highway No.: 1
	Mile Post: 298.82-298.86, right

1. Manual Purpose

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

2. 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: Shoulder/Off ramp

Flow direction: north

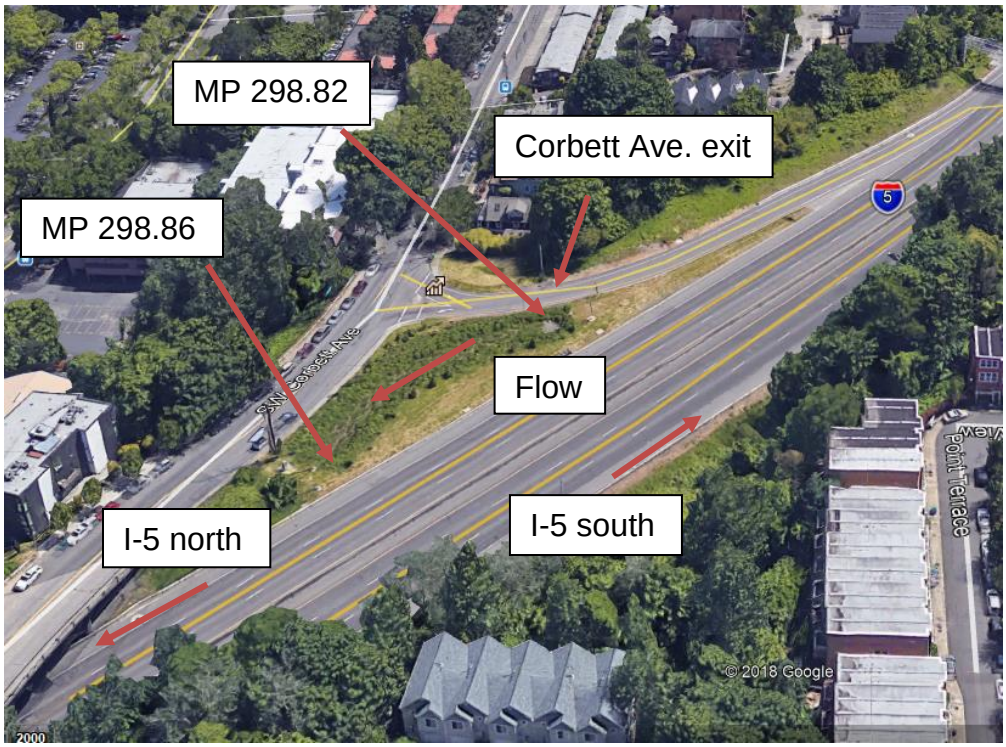


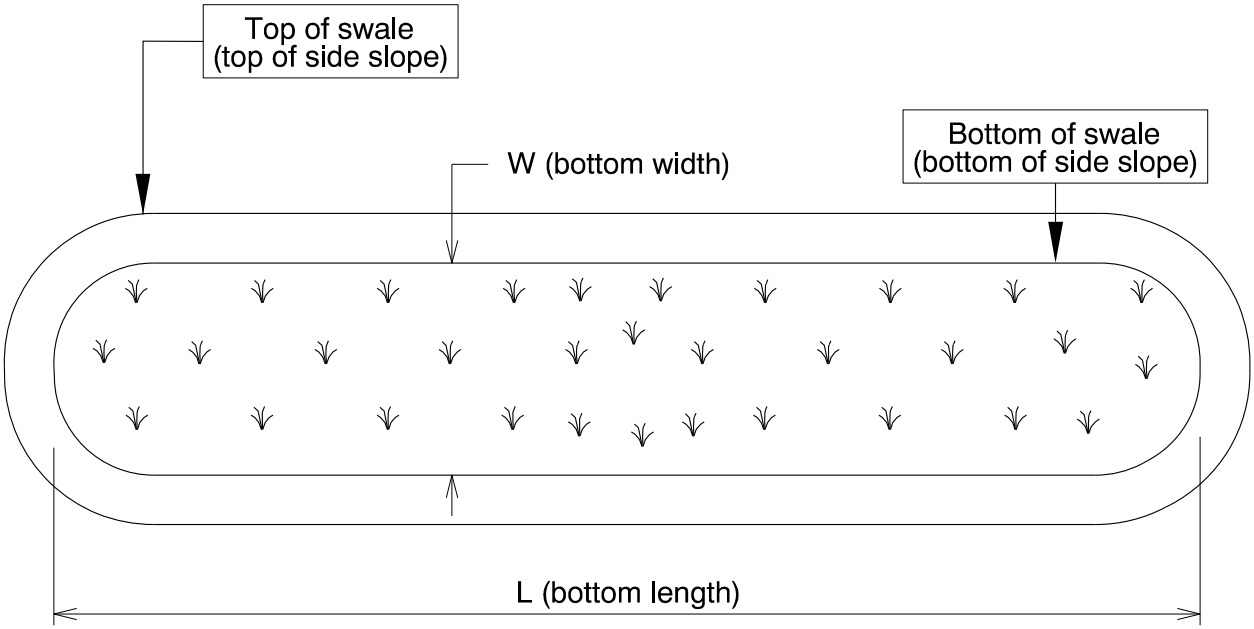
Figure 2: Facility location

3. Facility Summary

The length and width of a swale is based on the bottom dimensions.

The bottom length and bottom width of the swale is:

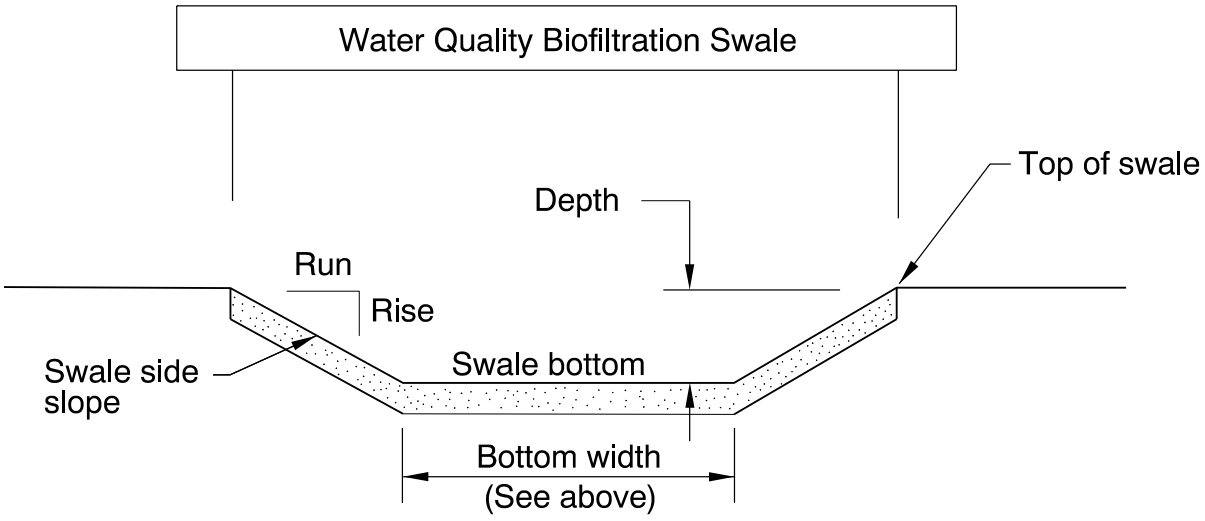
Bottom Length (feet)	Bottom Width (feet)
172	15



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

Depth and side slopes:

Depth (feet)	Rise (feet)	Run (feet)
3	1	3



Site Specific Information: Access to the facility is a shoulder in the gore area. This area is accessible from either the shoulder on I-5 or by taking the Corbett Ave. northbound exit. The facility has a diversion manhole and a pollution control manhole upstream from the swale. There are numerous trees and plantings within the maintenance area.

4. Facility Access

Maintenance access to the facility:

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

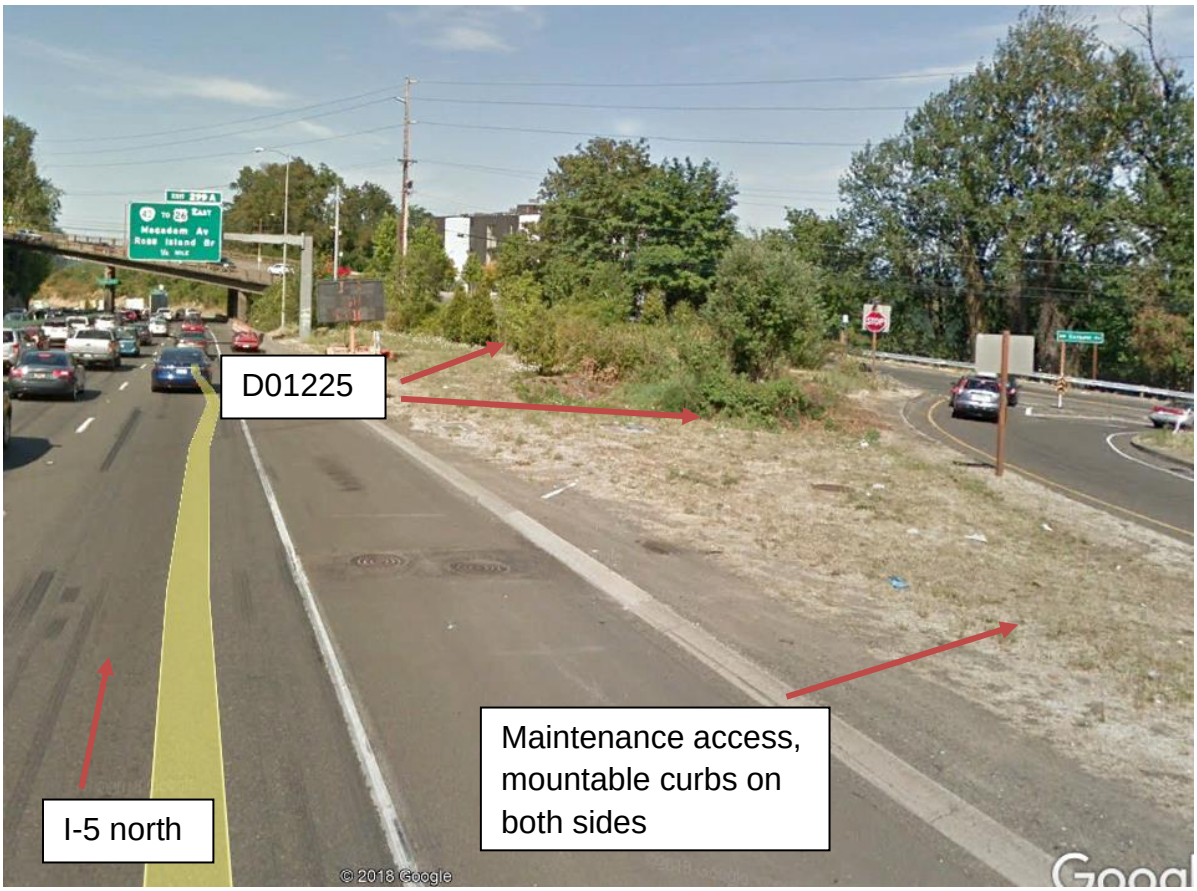


Figure 3: Maintenance access

5. Operational Components / Maintenance Items

Classification

This facility is classified as an:

☐ On-line Swale	☒ Off-line Swale
A swale that does not include a high flow bypass component; flow drains into and through the facility	A swale that treats low/small flows and diverts high flows using a bypass component

Bypass Component

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 swale. High flows are diverted around the swale using a bypass component**

Operational Components

A swale has many components that assist with treatment, conveyance, and reducing flow velocity to minimize erosion. The components in use can vary depending if the facility was designed to operate on-line or off-line. 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 Water Quality Biofiltration Swales (implemented March 2017) 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/

Operational Plan

The applicable standard operational plan for this facility is:

☐ Operational Plan A	☐ Operational Plan B	☒ Operational Plan C
An on-line swale with roadside ditches	**An on-line swale with piped inlets and outlets**	**An off-line swale with a piped high flow bypass**
A standard operational plan illustrates the general facility footprint configuration and explains the purpose of each facility component. Operational plans (A, B, C) are provided in the Standard Operation Manual.		

See Appendix A for the site specific operational plan.

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 below.

Table 1: Swale Components		ID #
Manholes/Structures		
Pre-treatment manhole	☒	**S1**
Weir type flow splitter/flow splitter manhole	☒	**S2**
Orifice type flow splitter/flow splitter manhole	☐	**S3**
Standard manhole	☐	**S4**
Swale Inlet		
Pavement sheet flow	☐	**S5**
Inlet Pipe (s)	☒	**S6**
Open channel inlet	☐	**S7**
Riprap pad	☐	**S8**
Ground Cover		
Grass bottom	☒	**S9**
Grass side slopes	☒	**S10**
Granular drain rock	☒	**S11**
Plantings	☒	**S12**
Underground Components		
Geotextile fabric	☒	**S13**
Water quality mix	☒	**S14**
Perforated pipe	☒	**S15**
Porous pavers (access grid)	☐	**S16**
Flow Spreader		
Rock basin (used at inlet)	☒	**S17**
Anchored board (one board installed in flow spreader)	☒	**S18**
Other:	☐	**S19**
Swale Outlet		
Catch basin with grate	☐	**S20**
Outlet Pipe (s)	☒	**S21**
Open channel outlet	☐	**S22**
Auxiliary Outlet:	☐	**S23**
Outfall Type		
Waterbody (**C**reek/**L**ake/**O**cean)	☐ **C** ☐ **L** ☐**O**	**S24**
Ditch	☐	**S25**
Storm drain system	☒	**S26**
Outfall Components		
Riprap pad	☐	**S27**
Riprap bank protection	☐	**S28**

6. Maintenance

Maintenance Frequency/Maintain Records

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

Maintenance Guide/Maintenance Actions

The ODOT Routine Road Maintenance Water Quality and Habitat Guide (the *Blue Book*) 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 swales:

- Table 1 (General Maintenance): Contains general maintenance and inspection guidelines that are applicable to all ODOT water quality facilities
- Table 3 (Maintenance of Water Quality or Biofiltration Swales): Contains maintenance information for swales

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

7. Limitations

Access grid installed:

☒ No	☐ Yes
There are no duty porous pavers installed in this swale	

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

Equipment wheels should be kept on the tops and side slopes. Mower arms may be run along the swale bottom.

8. Waste Material Handling

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

http://www.oregon.gov/ODOT/Maintenance/Documents/ems_manual.pdf

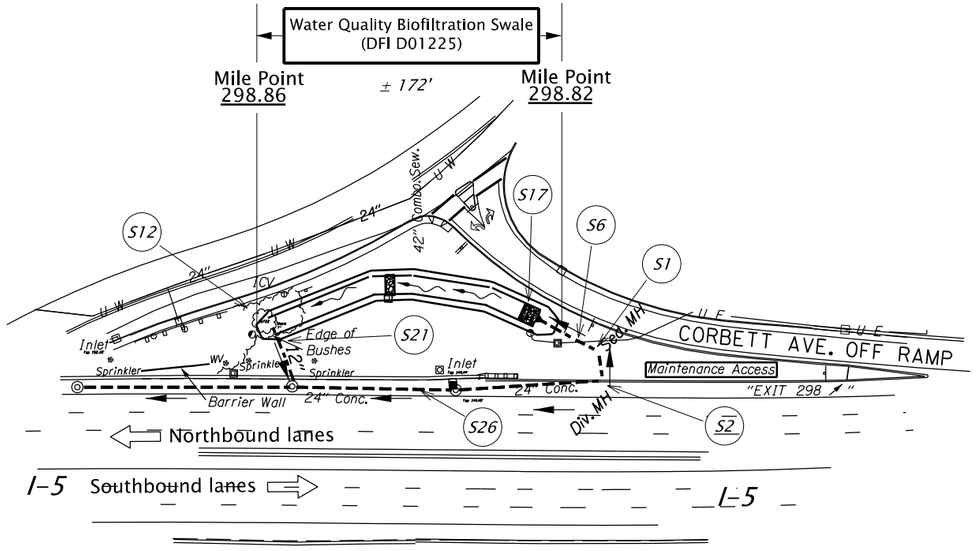
Contact any of the following for more detailed information about management of waste materials found on site:

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

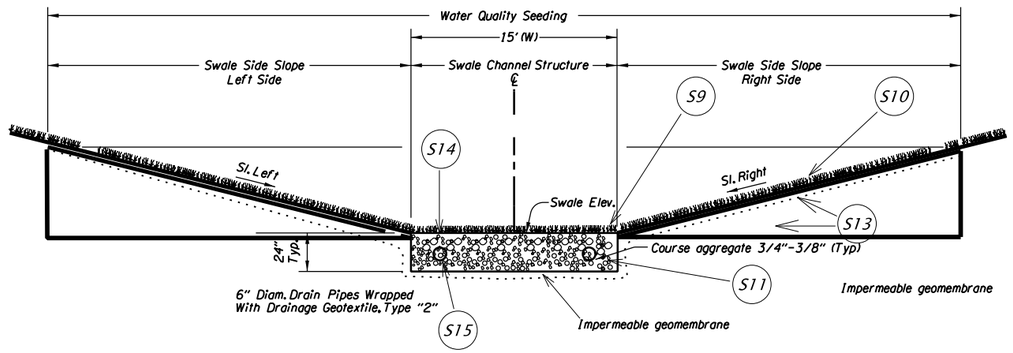
A Appendix A – Site Specific Operational Plan

Contents:

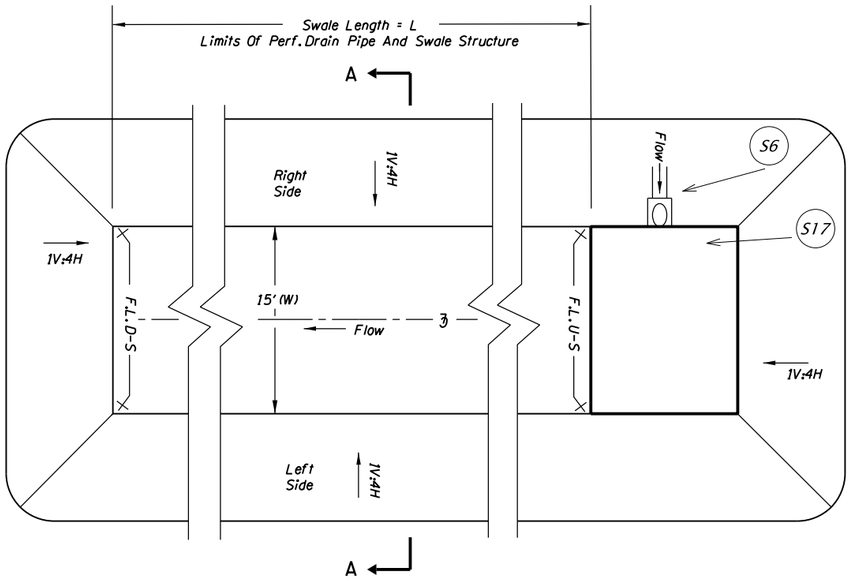
Operational Plan: DFI D01225



PLAN
N.T.S.



SECTION A-A
N.T.S.



PLAN
N.T.S.

N

LEGEND:

- X# — Facility Component (see table 1 in O&M Manual)
- ◉ and/or ◎ — Manhole
- ■ and/or □ — Inlet
- Storm Pipe (Facility)
- Storm Pipe
- Conveyance Direction
- Pavement / Facility Flow Path
- Traffic Flow Direction

OREGON DEPARTMENT OF TRANSPORTATION

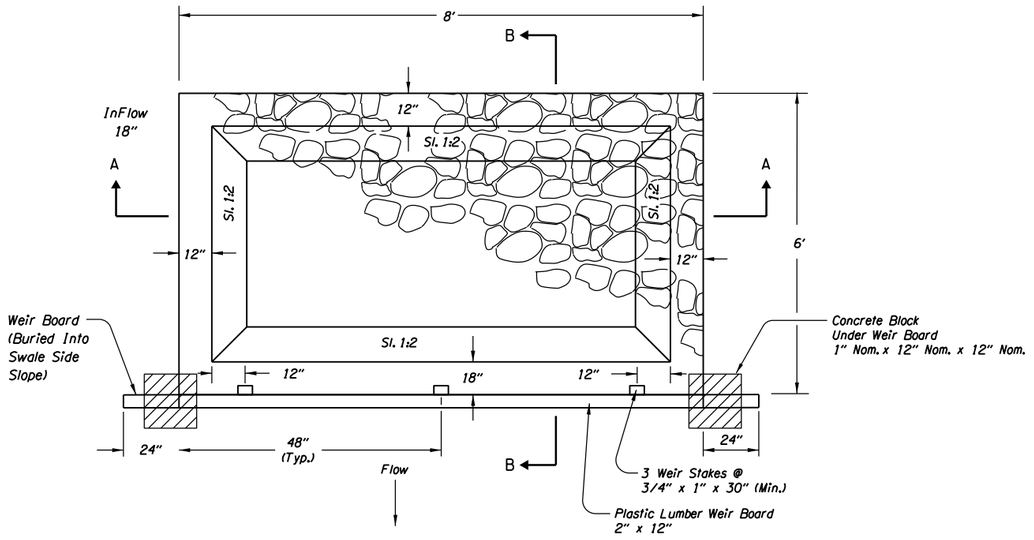
Sht. 01 of 02

Prepared By: Laila Bush

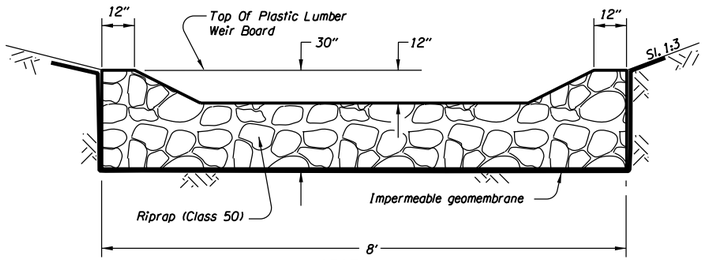
Drafted By: Laila Bush

DFI D01225
MAINTENANCE DISTRICT 2B HWY 1
BIOFILTRATION SWALE
HIGHWAY MP 298.82 - 298.86
MULTNOMAH

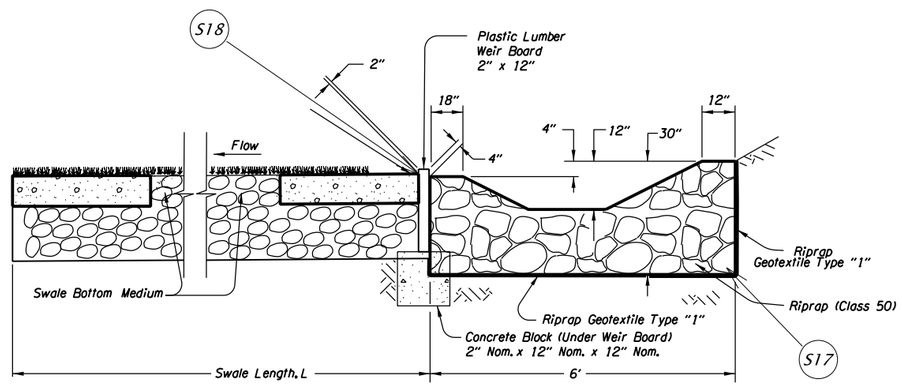
WATER QUALITY SWALE FLOW SPREADER



PLAN

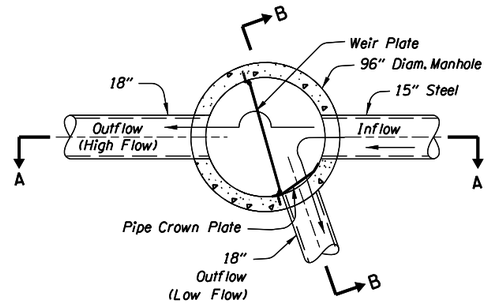


SECTION A-A

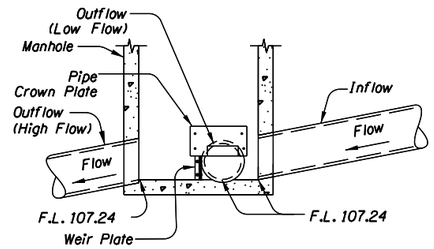


SECTION B-B

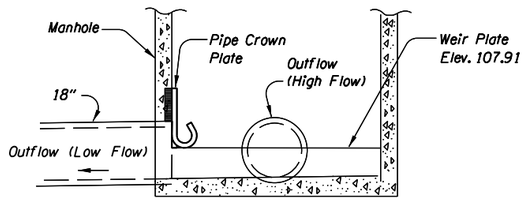
DIVERSION MANHOLE "HIGH-LOW", LOW FLOW TO SIDE



PLAN



SECTION A-A



SECTION B-B

LEGEND:

- X# — Facility Component (see table 1 in O&M Manual)
- ◉ and/or ◎ — Manhole
- ■ and/or □ — Inlet
- Storm Pipe (Facility)
- Storm Pipe
- Conveyance Direction
- Pavement / Facility Flow Path
- Traffic Flow Direction

N

OREGON DEPARTMENT OF TRANSPORTATION

Sht. 02 of 02

Prepared By: Laila Bush

Drafted By: Laila Bush

DFI D01225
MAINTENANCE DISTRICT 2B HWY 1
BIOFILTRATION SWALE
HIGHWAY MP 298.82 - 298.86
MULTNOMAH COUNTY

B Appendix B – Project Contract Plans

Contents:

Site Specific Subset of Project Contract Plan 43V-121

43V-121

INDEX OF SHEETS	
SHEET NO.	DESCRIPTION
1	Title Sheet
1A	Index Of Sheets Cont'd.
1A-2	Std. Drg. Nos.

No.	DATE	REVISIONS	BY
3	04-27-10	Changed bid date	LAK

STATE OF OREGON

DEPARTMENT OF TRANSPORTATION

PLANS FOR PROPOSED PROJECT

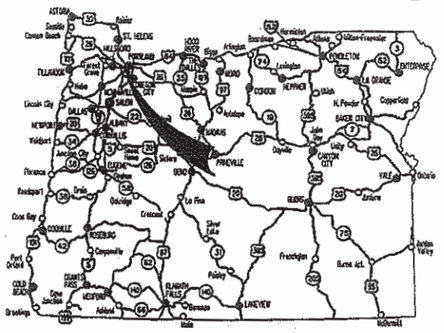
GRADING, DRAINAGE, STRUCTURES, PAVING, SIGNING AND AUTOMATIC TRAFFIC RECORDER

I-5: SW IOWA STREET VIADUCT BR #08197 SEC.

PACIFIC HIGHWAY

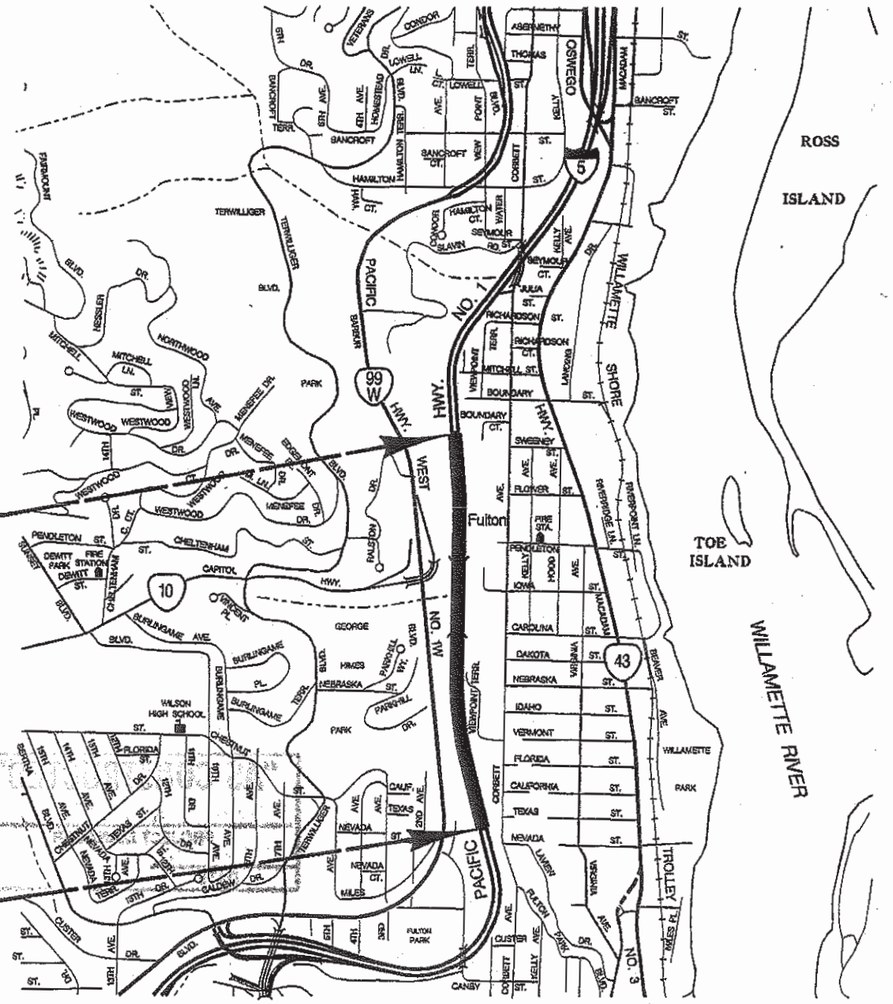
MULTNOMAH COUNTY

3 MAY 2010



Overall Length Of Project - 0.85 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. (Note: The Telephone Number For The Oregon Utility Center Is (503) 232-1987.)



BEGINNING OF PROJECT
HPP-BHF-S001(356)
STA. "I" 36+60 (M.P. 298.68)

END OF PROJECT
HPP-BHF-S001(356)
STA. "I" 82+00 (M.P. 297.83)

"AS CONSTRUCTED"
Wayne A. Stalder
PROJECT MANAGER
15JAN 2015
DATE

LET'S ALL WORK TOGETHER TO MAKE THIS JOB SAFE

OREGON TRANSPORTATION COMMISSION

Gail Achterman	CHAIR
Michael Nelson	VICE-CHAIR
Janice Wilson	COMMISSIONER
Alan Brown	COMMISSIONER
David Lohman	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.

Approving Authority: Naveen G. Chandra
Naveen G. Chandra, P.E.
Project Delivery Manager, Region 1

Concurrence by ODOT Chief Engineer

N

Sec. 15, 22
T. 1 S., R. 1 E., W.M.

I-5: SW IOWA STREET VIADUCT BR #08197 SEC.
PACIFIC HIGHWAY
MULTNOMAH COUNTY

FEDERAL HIGHWAY ADMINISTRATION	PROJECT NUMBER	SHEET NO.
OREGON DIVISION	HPP-BHF-S001(356)	1

001324-000

\\sc-reglhq-1\Drafting_Projects\14949_Iowa_St_Viaduct\Addendum_4-27-10\14949RI.TSI :: Default 4/27/2010 8:12:05 AM hwye19g

INDEX OF SHEETS, CONT'D.

SHEET NO.	DESCRIPTION
2, 2A Thru 2A-15	Typical Sections
2B Thru 2B-18	Details
2C Thru 2C-30	Traffic Control Plan
2D Thru 2D-3	Pipe Data Sheet
3	Alignment & General Construction
3A	Not Used
3B	Drainage & Utilities
3C	Profile
3C-2	Drainage Profile
4	Alignment & General Construction
4A	Not Used
4B	Drainage & Utilities
4C	Profile
4C-2	Drainage Profile
5	Alignment & General Construction
5A	Temporary Drainage Plan
5A-2	Temporary Drainage Profile
5B	Drainage & Utilities
5C	Profile
5C-2	Drainage Profile
6	Alignment & General Construction
6A & 6A-2	Temporary Drainage Plan
6A-3	Temporary Drainage Profile
6B	Drainage & Utilities
6C	Drainage Profile
6C-2 & 6C-3	Drainage Profile
7	Alignment & General Construction
7A	Not Used
7B	Drainage & Utilities
7C	Profile
7C-2	Drainage Profile
	GEO/HYDRO
GA Thru GA-5	Erosion Control Plan
GA-6 Thru GA-10	Erosion Control Details
GB Thru GB-4	Plan
GB-5 Thru GB-7	Existing Landslides
GB-8 & GB-9	Legend
GB-10 Thru GB-12	Geotechnical Data, Retaining Wall 1
GB-13 Thru GB-16	Geotechnical Data, Retaining Wall 2
GB-17	Geotechnical Data, Retaining Wall 3
GB-18 Thru GB-23	Geotechnical Data, Retaining Walls 4A & 4B
GB-24	Geotechnical Data, Retaining Walls 5
GB-25 & GB-26	Geotechnical Data, Retaining Walls 6
GB-27 Thru GB-31	Geotechnical Data, Sections A-A Thru E-E
GB-32 Thru GB-38	Geotechnical Data, Sections J-J Thru Q-Q

INDEX OF SHEETS, CONT'D.

SHEET NO.	DRAWING NO.	DESCRIPTION
		RETAINING WALLS
GC	83485	Retaining Walls 1-6 & NB Moment Slabs, Layout
GC-2	83176	Retaining Wall 1, Plan & Elevation
GC-3	83177	Retaining Wall 2, Plan & Elevation
GC-4	83178	Retaining Wall 1 & 2, General Notes
GC-5	83179	Retaining Walls 1 & 2, Typical Elev. & Section
GC-6	83180	Retaining Wall 1, Soldier Pile & Tieback, Sch. 1
GC-7	83181	Retaining Wall 1, Soldier Pile & Tieback, Sch. 2
GC-8	83182	Retaining Wall 2, Soldier Pile & Tieback, Sch. 1
GC-9	83183	Retaining Wall 2, Soldier Pile & Tieback, Sch. 2
GC-10	83184	Retaining Walls 1 & 2, Details 1
GC-11	83483	Retaining Walls 1 & 2, Details 2
GC-12	83482	Retaining Walls 1, 2 & 6, Class 1 Tendon
GC-13	83450	Retaining Walls 3, Plan & Elevation
GC-14	83457	Retaining Wall 4A, Plan & Elevation
GC-15	83458	Retaining Walls 3 & 4A, Details
GC-16	83459	Retaining Wall 4B, Plan & Elevation 1
GC-17	83460	Retaining Wall 4B, Plan & Elevation 2
GC-18	83461	Retaining Wall 4B, Plan & Elevation 3
GC-19	83462	Retaining Wall 4B, Plan & Elevation 4
GC-20	83463	Retaining Wall 4B, Details 1
GC-21	83464	Retaining Wall 4B, Details 2
GC-22	83468	Retaining Wall 5, Plan & Elevation
GC-23	83469	Retaining Wall 5, Details
GC-24	83472	Retaining Wall 6, Plan & Profile
GC-25	83473	Retaining Wall 6, General Notes
GC-26	83474	Retaining Wall 6, Typ. Elevation & Section
GC-27	83475	Retaining Wall 6, Soldier Piles & Tiebacks 1
GC-28	83476	Retaining Wall 6, Soldier Piles & Tiebacks 2
GC-29	83477	Retaining Wall 6, Details 1
GC-30	83478	Retaining Wall 6, Details 2
GC-31	83479	Retaining Wall 6, Wall Details at Pipe Crossing
GC-32	83480	Retaining Wall 6, Pile Splice Details
		MOMENT SLABS
GC-33	83465	Type A, Moment Slab & Barrier 1
GC-34	83466	Type A, Moment Slab & Barrier 2
GC-35	83481	Type B, Moment Slab & Barrier
GC-36	83958	Type C, Moment Slab & Barrier

INDEX OF SHEETS, CONT'D.

SHEET NO.	DESCRIPTION
GJ	Water Quality, Plan & Notes
GJ-2	Water Quality Profiles
GJ-3 & GJ-4	Water Quality Details
GJ-5	Manhole With Type "D" Inlet Details
GJ-6	Diversion Manhole Details
GJ-7	Water Quality Facility Erosion Control Plan
GL	Extent of Surface Soil Contamination
GN, GN-2 Thru GN-7	Swale Development Plan

INDEX OF SHEETS, CONT'D.

DRAWING NO.	DESCRIPTION
	BRIDGE NO. 20788
83129	General Layout
83130	Plan and Elevation
83131	General Notes
83132 Thru 83136	Geotechnical Data
83137	Stage I Construction Plan
83138	Stage II Construction Plan
83139	Stage III & IV Construction Plan
83140	Construction Staging Section (Bent 2)
83141	Construction Staging Section (Bent 3)
83142	Temporary Barrier Details
83143	Temporary Detour Structure & Work Platform
83144	Temporary Access Road
83145	Footing Plan 1
83146	Footing Plan 2
83147	Deck Plan
83148	Typical Deck Section
83149	Deck Details & Rebar Plan
83150	Misc. Details
83151	Bulb-T Girder Schedule
83152	Bulb-T Girder Details
83153	Additional Bulb-T Girder Details
83154	Bent 1
83155	Bent 1 Details
83156	Bearings
83157	Bent 2
83158	Bent 2 Section
83159	Bent 2 Elevation
83160	Bent 3
83161	Bent 3 Section
83162	Bent 3 Elevation
83163	Bent 4 Plan & Elevation
83164	Bent 4 Details
83165	Bent 4 Section
83166	Drilled Shaft Details
83167	Misc. Details 2
83168	Bent 1 Wingwall A
83169	Bent 1 Wingwall B
83170	Bents 2W & 4W Wingwalls C & E
83171	Bent 4 Wingwall "D"
83172	Bridge Rail West
83173	Bridge Rail East 1
83174	Bridge Rail East 2
83175	Concrete Bridge Rail Details

INDEX OF SHEETS, CONT'D.

SHEET NO.	DESCRIPTION
	PERMANENT PAVEMENT MARKINGS
ST, ST-2 Thru ST-4	Striping Plan
	PERMANENT SIGNING
S-11794 Thru S-11796	Signing Plan
S-11797 & S-11798	Signing Details
S-11799	Post & Data Table
S-11800	Cantilever Sign Support
	ITS SIGNAGE
ITS-944	ITS Legend, Symbols & General Notes
~~ITS-945 & ITS-946~~	Replaced by SK-NB VMS
ITS-947 & ITS-948	Terwilliger VMS Site Plans
ITS-949	Eliminate
ITS-950 & ITS-951	ITS Details
TDS-26-016A	Iowa St. ATR Site Plan & Legend
TDS-26-016B	Iowa St. ATR Details & Legend
	ILLUMINATION
I-1676	Illumination Plan: Legend & Light Pole Table
I-1677 Thru I-1681	Illumination Plan
	TEMPORARY ILLUMINATION
I-1709 Thru I-1713	Temporary Illumination Plan
	AS-BUILT DRAWINGS (V-FILE 12V-106) (FOR INFORMATION ONLY)
7 & 2G	W. MARQUAM INTCHGE.-N. TIGARD INTCHGE. SEC.

"AS CONSTRUCTED"
Wayne A. Statler
PROJECT MANAGER
15 JAN 2015
DATE

No.	DATE	REVISIONS	BY
1	04-08-10	Add as-built drawing list	LAK
		(2 as-built sheets added to the package)	

I-5: SW IOWA STREET VIADUCT BR #08197 SEC
PACIFIC HIGHWAY
MULTNOMAH COUNTY

FEDERAL HIGHWAY ADMINISTRATION	PROJECT NUMBER	SHEET NO.
OREGON DIVISION	HPP-BHF-5001(356)	1A

Standard Drawings located on the web at:
http://www.oregon.gov/ODOT/HWY/ENGSERVICES/standard drawings home.shtml

Standard Drg. Nos.

RD140	- Rdwy. Cross Slopes Superelevated Sections
RD150	- Slope Rounding
RD300	- Trench Backfill, Bedding, Pipe Zone And Mult. Installations
RD302	- Street Cut
RD312	- Subsurface Drain
RD316	- Sloped Ends For Metal Pipe
RD318	- Sloped Ends For Concrete Pipe
RD320	- Paved End Slope For Culverts 60" Maximum Pipe Size
RD326	- Coupling Bands For Corrugated Metal Pipe
RD330	- Metal Pipe Slope Anchors
RD334	- Locator Post
RD336, RD338, RD340, RD342, RD344, RD346	- Manholes
RD356	- Manhole Cover & Frames
RD358	- Manhole Slope Protectors
RD360	- Manhole Frame Adjustment
RD364, RD366, RD368, RD370, RD372	- Concrete Inlets
RD376	- Miscellaneous Drainage Structures
RD380, RD382, RD384, RD386	- Pipe Fill Height Tables
RD410	- Guardrail
RD500	- Precast Conc. Bar. Pin & Loop Assembly
RD505	- Concrete Barrier Cast-In-Place
RD510	- Concrete Barrier Terminal
RD515	- Median Barrier Anchoring Details
RD516	- Securing Concrete Barrier To Roadway
RD520	- Cast-In-Place Conc. Barrier Transition To Bridge Rail
RD526	- Standard Concrete Barrier Buried In Backslope
RD530	- Guardrail Connection To Concrete Barrier
RD535	- Concrete Barrier (Modified) Around Median Obstacle
RD545	- Precast Tall (42") Concrete Barrier
RD550	- Cast-In-Place Tall Conc. Barrier Tran. To Bridge Rail
RD560	- Cast-In-Place Tall Conc. Barrier Tran. To Std. Conc. Barrier
RD610	- Asphalt Pavement Details
RD700	- Curbs
RD755	- Sidewalk Ramp Details
RD756, RD757	- Sidewalk Ramp Placement
RD815	- Chain Link Fence
RD1000	- Construction Entrances
RD1005	- Check Dams
RD1010, RD1015	- Inlet Protection
RD1025, RD1035	- Sediment Barrier
RD1040	- Sediment Fence
RD1045	- Temporary Slope Drains
RD1050	- Temporary Scour Holes
RD1055	- Matting
RD1060	- Tire Wash Facility

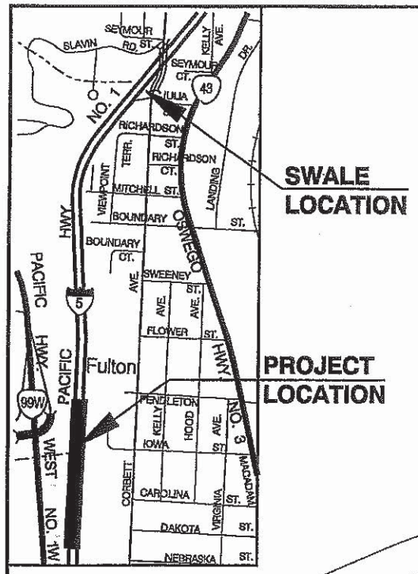
BR140, BR145	- Expansion Joints
BR165	- Bridge End Panel Details
BR170	- Pile Trestle For Temp. Detour Bridges
BR236	- Trailing End Bridge Connection Conc. Bridge Rail To Guardrail
BR290	- 3'-6" Type "F" Rail
BR321	- BT90 And BT96 Girders
BR350	- Temp. Diaphragm Beam For Prestressed Conc. Girders
BR970	- Luminaire Base On Structures With Mounting Details
TM200	- Sign Installation Details
TM201	- Miscellaneous Sign Placement Details
TM204	- Flag Board Mounting Details
TM211, TM212	- Signing Details
TM220	- Multi-Post Installations
TM221, TM222	- Milepost Marker Details
TM224	- Directional Sign Layout
TM225	- Exit Number & Gore Signing Details
TM231, TM232, TM233	- Mounting Details For Removable Legend
TM500, TM502	- Pavement Marking Standard Details
TM515	- Raised Pavement Markers
TM520	- Durable Pavement Markings
TM560	- Alignment Layout
TM570	- Traffic Delineators
TM601	- Multi-Post Breakaway Sign Supports
TM602	- Triangular Base Breakaway Multi-Direction Slip Base
TM622, TM623, TM624, TM625, TM626, TM627	- Monotube Cantilever Sign Support
TM629, TM630	- Slip Base & Fixed Base Luminaire Supports
TM635	- Breakaway Sign & Luminaire Supports
TM670	- Perm. Signing Wood Post Supports Sizing Charts
TM671	- 3 Second Gust Wind Speed Isotach
TM677	- Sign Mounts
TM681, TM687, TM688	- Square Tube Sign Supports
TM800	- Tables, Abrupt Edge And PCMS Details
TM810	- Temporary Reflective Pavement Markers
TM820	- Temporary Barricades
TM821	- Temporary Sign Supports
TM830	- Temporary Concrete Barrier And Rumble Strips
TM831	- Temporary Impact Attenuators
TM840, TM841	- Closure Details
TM850	- 2-Lane, 2 Way Roadways
TM860, TM861, TM862	- Freeway Sections
No R/W Map	

"AS CONSTRUCTED"
Wayne A. Stalter
PROJECT MANAGER
15 JAN 2015
DATE

Standard Drawings located on the web at:
http://www.oregon.gov/ODOT/HWY/ENGSERVICES/standard_drawings_home.shtml

I-5: SW IOWA STREET VIADUCT BR #08197 SEC.
PACIFIC HIGHWAY
MULTNOMAH COUNTY

FEDERAL HIGHWAY ADMINISTRATION	PROJECT NUMBER	SHEET NO.
OREGON DIVISION	HPP-BHF-S001(356)	1A-2



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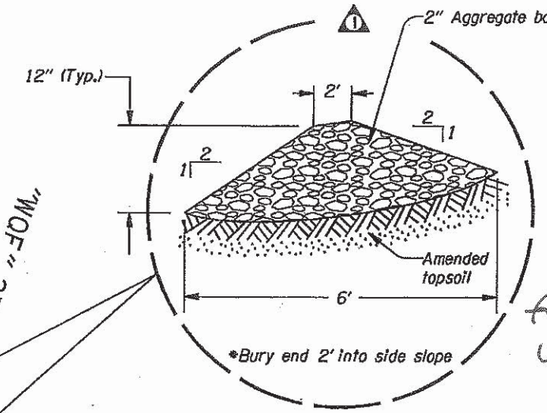
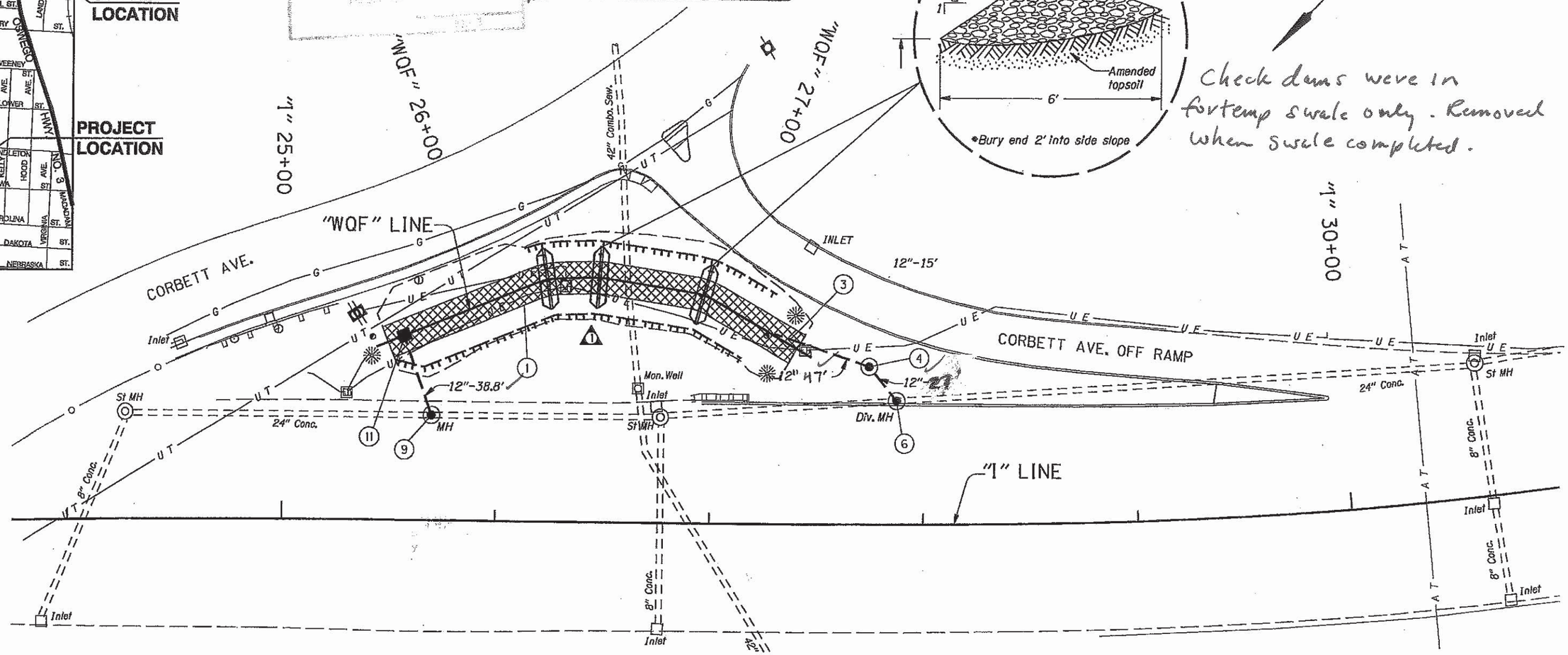
Wayne A. Statler
PROJECT MANAGER
17 DEC 2012
DATE



Check dams were in for temp swale only. Removed when swale completed.



PLAN

3 (1) Construct Swale
(For details, see shts. GJ-2 & GJ-3)

(2) 2

3 (3) Sta. "I" 27+29.5, 88.0' Lt.
Const. pipe sloped end
Inst. 12" storm sew. pipe - 47'
5' depth

3 (4) Sta. "I" 27+74.2, 73.0' Lt.
Const. pollution control manhole
Inst. 12" storm sew. pipe - 27'
5' depth
(See drg. no. RD340)

(5) 2

3 (6) Sta. "I" 27+86.8, 56.7' Lt.
Const. diversion manhole over extg. sewer

(7) 2

(8) 2

3 (9) Sta. "I" 25+69.7, 48.7' Lt.
Const. manhole over extg. sewer
Inst. 12" storm sew. pipe - 38.8'
10' depth
Trench resurf. - 4 sq.yd.

(10) 2

3 (11) Sta. "I" 25+56.5, 85.2' Lt. on top of
Const. type "D" mod. inlet manhole

"AS CONSTRUCTED"
Wayne A. Statler
PROJECT MANAGER
15 JAN 2015
DATE

No.	DATE	REVISIONS	BY
1	09-24-10	Revised swale & drainage structures	S.B. for B.S.C.
2	09-24-10	Deleted note	S.B. for B.S.C.
3	09-24-10	Edited note	S.B. for B.S.C.

REGISTERED PROFESSIONAL ENGINEER
19156
OREGON
JULY 15, 1997
BRUCE S. COUNCIL
RENEWAL DATE: 12-31-2011

OREGON DEPARTMENT OF TRANSPORTATION

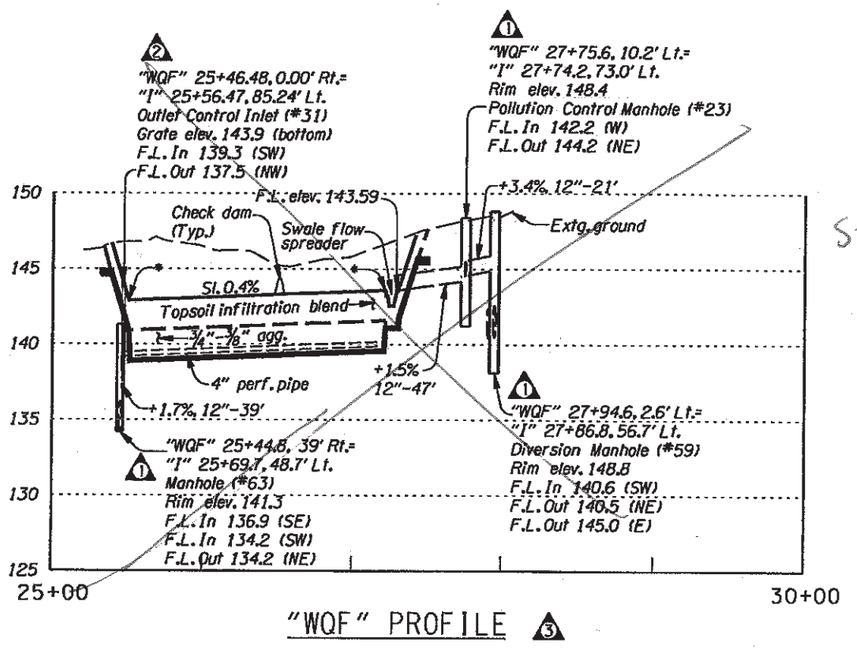
REGION 1 - Geo/Hydro/HazMat Unit

I-5: SW IOWA STREET VIADUCT BR*08197 SEC.
PACIFIC HIGHWAY
MULTNOMAH COUNTY

Reviewed By - Dan Gunther
Designed By - Bruce Council
Drafted By - Charlotte Gerken

WATER QUALITY PLAN

SHEET NO. GJ

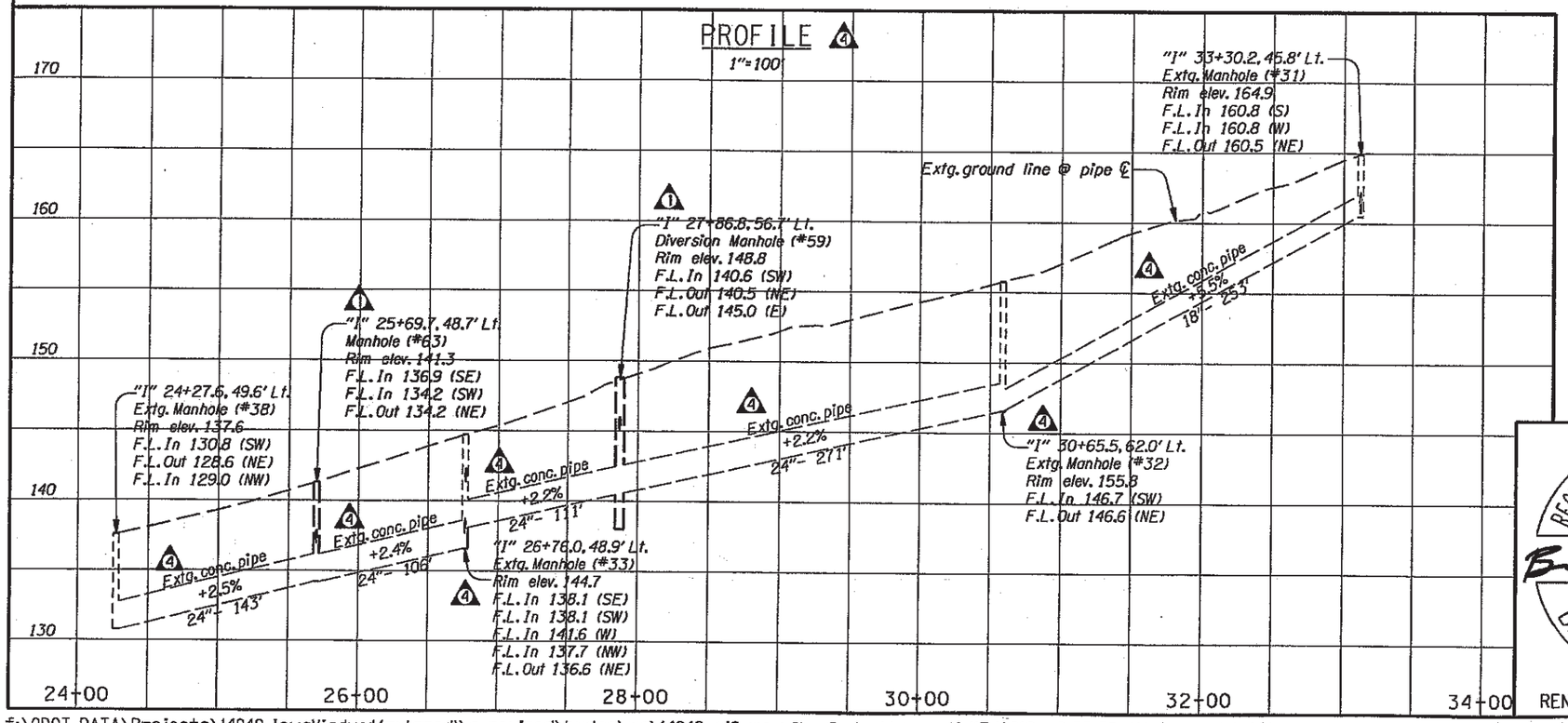


"WQF" PROFILE ③

see next sheet

"AS CONSTRUCTED"
Wayne A. Statler
PROJECT MANAGER
17 Dec 2012
DATE

PROFILE ④
1"=100



Notes:
* *For elevations, see shts. GJ-3 & GJ-4.*
Rim elevations are at center of MH lid.
Verify pipe flow lines prior to ordering manholes and inlets

No.	DATE	REVISIONS	BY
①	04-06-10	Adjusted manhole rim & pipe invert	B.S.C.
②	04-06-10	Adjusted inlet grate & pipe invert	B.S.C.
③	9-24-10	Revised swale & drainage structure	S.B. for B.S.C.
④	12-8-10	Edited note and profile	B.S.C.

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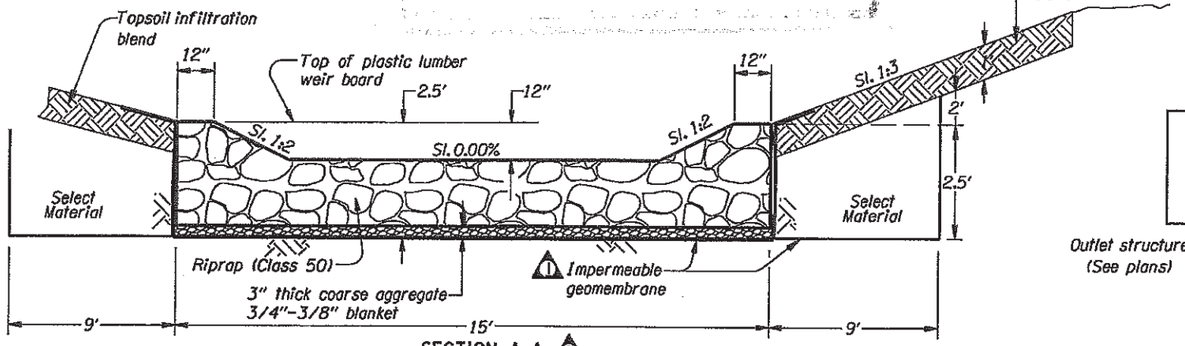
Designed By - Bruce Council
Drafted By - Charlotte Gerken

WATER QUALITY PROFILE

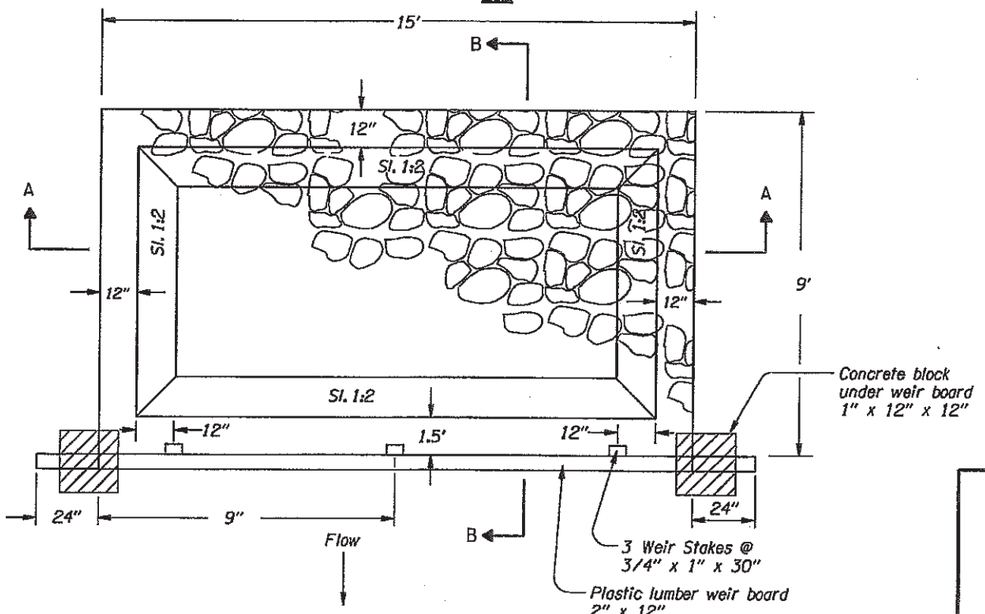
SHEET NO. GJ-2

WATER QUALITY SWALE FLOW SPREADER

"AS CONSTRUCTED"
Wayne A. Stafler
PROJECT MANAGER
17 Dec 2017
DATE

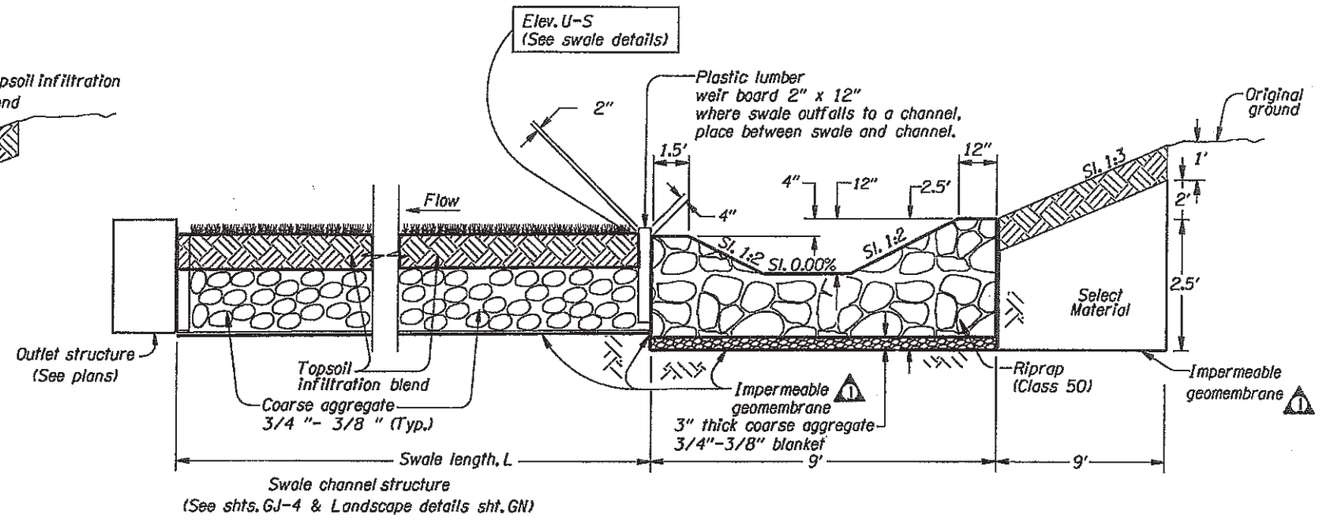


SECTION A-A 2



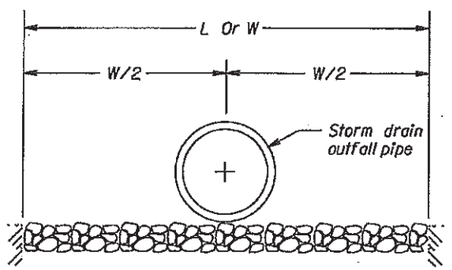
Note:
See 01040 for topsoil infiltration blend composition

PLAN
SWALE FLOW SPREADER

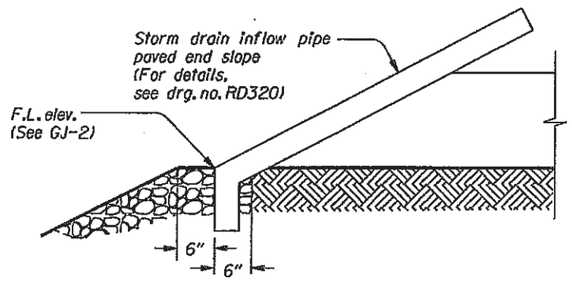


SECTION B-B 2

* Outfall end similar



LOOKING AT A SIDE



Note:
Pipe F.L. elev. and top of weir board elev. are the same.

SECTION THROUGH SIDE PIPE OUTLET

All dimensions are in feet (') unless otherwise noted.

No.	DATE	REVISIONS	BY
1	04-05-10	Added prefix geo to membrane	B.S.C.
2	11-30-10	Modified section A-A and B-B	B.S.C.

REGISTERED PROFESSIONAL ENGINEER
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OREGON
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OREGON DEPARTMENT OF TRANSPORTATION

REGION 1 - Geo/Hydro/HazMat Unit

I-5: SW IOWA STREET VIADUCT BR#08197 SEC.
PACIFIC HIGHWAY
MULTNOMAH COUNTY

Reviewed By - Dan Gunther
Designed By - Bruce Council
Drafted By - Charlotte Gerken

WATER QUALITY DETAILS

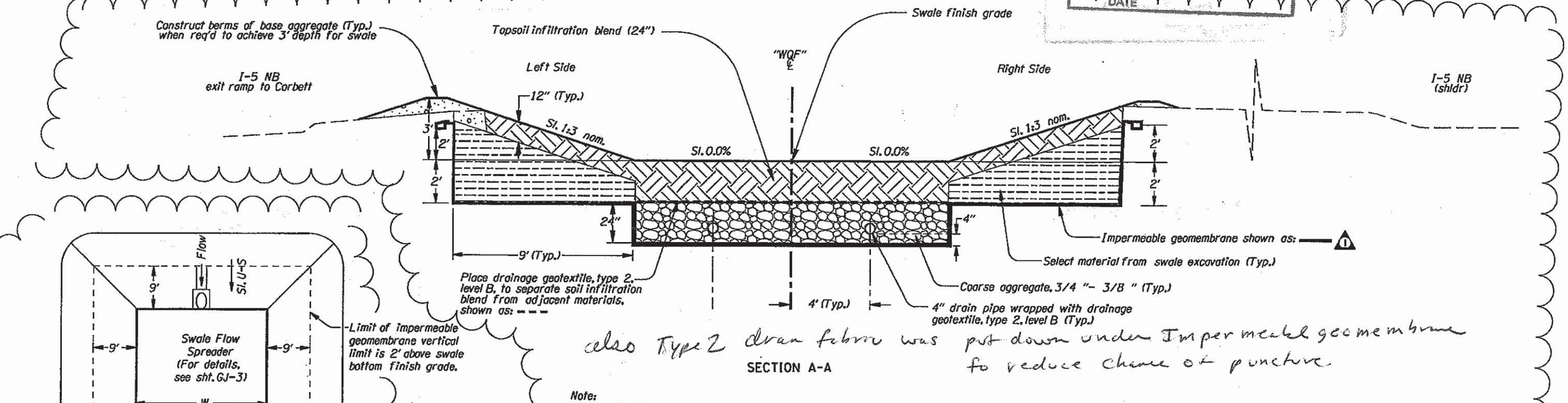
SHEET NO. GJ-3

WATER QUALITY SWALE GENERAL DETAILS
PLAN AND TYPICAL CROSS-SECTION

43V-121

"AS CONSTRUCTED"
Wayne A. Stalter
PROJECT MANAGER
17 Dec 2012
DATE

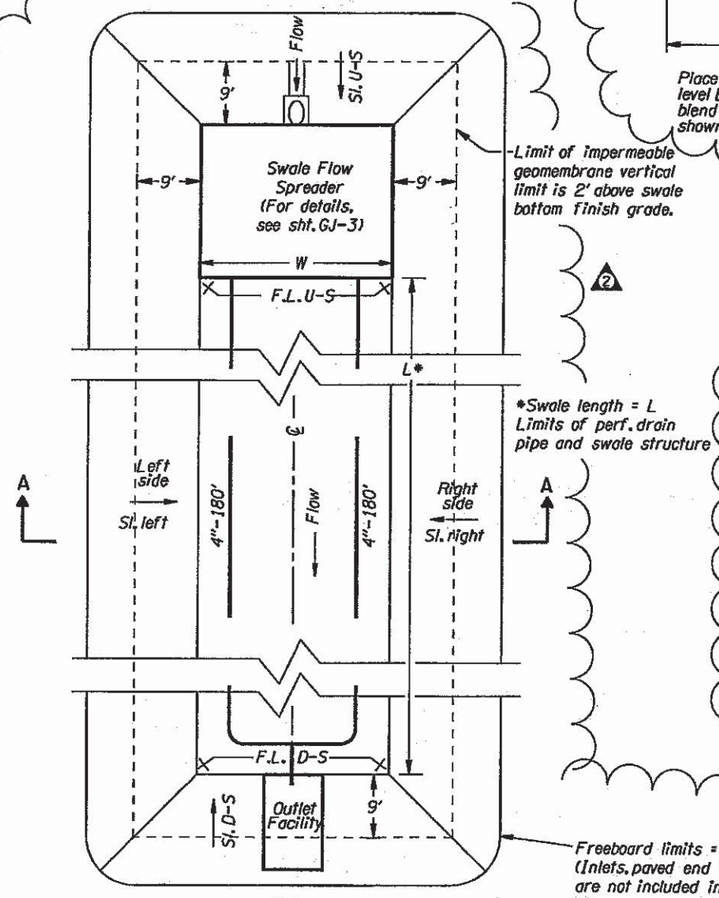
For additional Section A-A details, see also sht. GN. For inflow, outflow locations and elevations see sht. GJ.



SECTION A-A

also Type 2 drain fabric was put down under Impermeable geomembrane to reduce chance of puncture

Note:
See sht. GN for seeding, planting, and swale bottom medium details.



Limit of impermeable geomembrane vertical limit is 2' above swale bottom finish grade.

*Swale length = L
Limits of perf. drain pipe and swale structure

Freeboard limits = Pay limits for swale. (Inlets, paved end slopes and outlet facilities are not included in swale pay item.)

PLAN

Notes:
1) U-S = Upstream
2) D-S = Downstream
3) See site plans for pipe inverts at inlets

Swale ID	L (ft)	W (ft)	F.L. U-S (ft)	F.L. D-S (ft)	Long. Slope (%)	Side Slopes				Number of Underdrains	Freeboard Depth (ft)	Underdrain Tie-in Location	Swale Outlet Facility	D/S		U/S	
						U-S	D-S	Left	Right					Sta. "WQF"	Offset	Sta. "WQF"	Offset
WQF	172	15	143.6	142.9	0.4	1:3	1:3	1:3	1:3	2	3	"D" Mod. Inlet	"D" Mod. Inlet	25+50.00	0'	27+21.79	0'

Note:
For swale specifics, refer to the table on this sht.

No.	DATE	REVISIONS	BY
1	04-05-10	Added prefix geo to membrane	B.S.C.
2	10-31-10	Modified water quality facility	B.S.C.

All dimensions are in feet (') unless otherwise noted.

REGISTERED PROFESSIONAL ENGINEER
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OREGON
JULY 15, 1997
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OREGON DEPARTMENT OF TRANSPORTATION

REGION 1 - Geo/Hydro/HazMat Unit

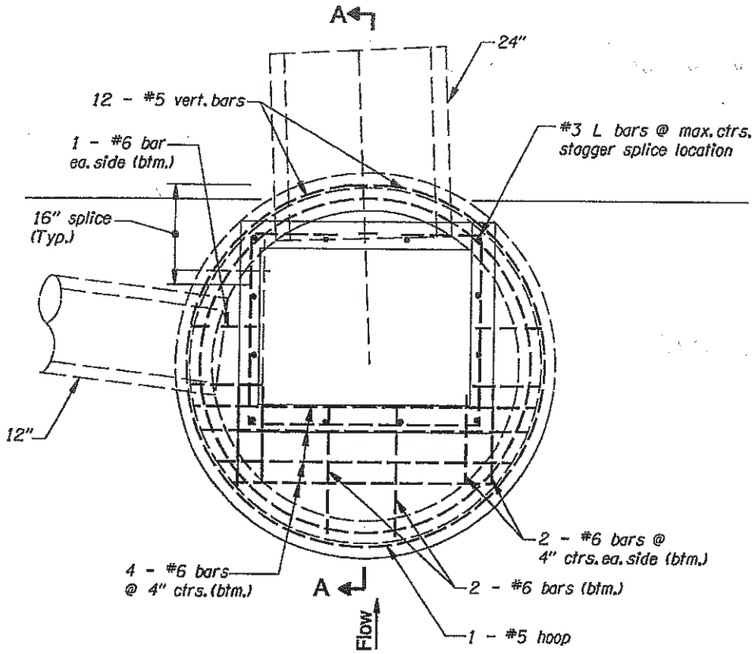
I-5: SW IOWA STREET VIADUCT BR#08197 SEC.
PACIFIC HIGHWAY
MULTNOMAH COUNTY

Reviewed By - Dan Gunther
Designed By - Bruce Council
Drafted By - Charlotte Gerken

WATER QUALITY DETAILS

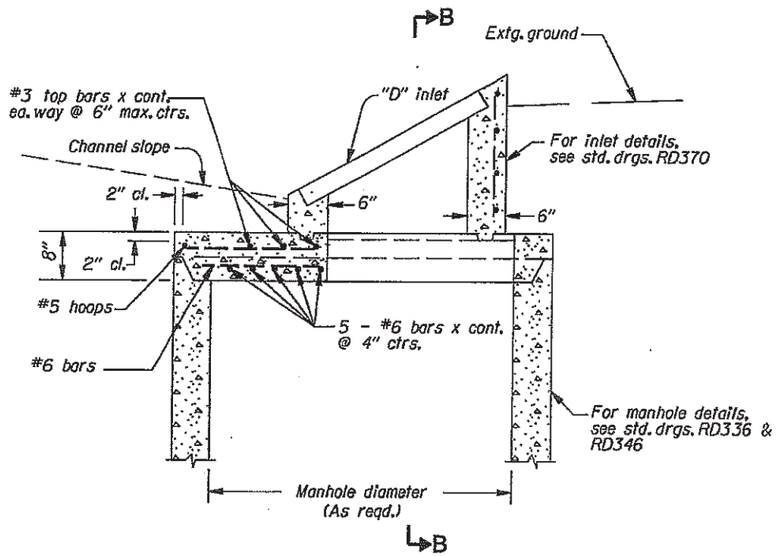
SHEET NO. GJ-4

MANHOLE W/TYPE "D" INLET DETAIL



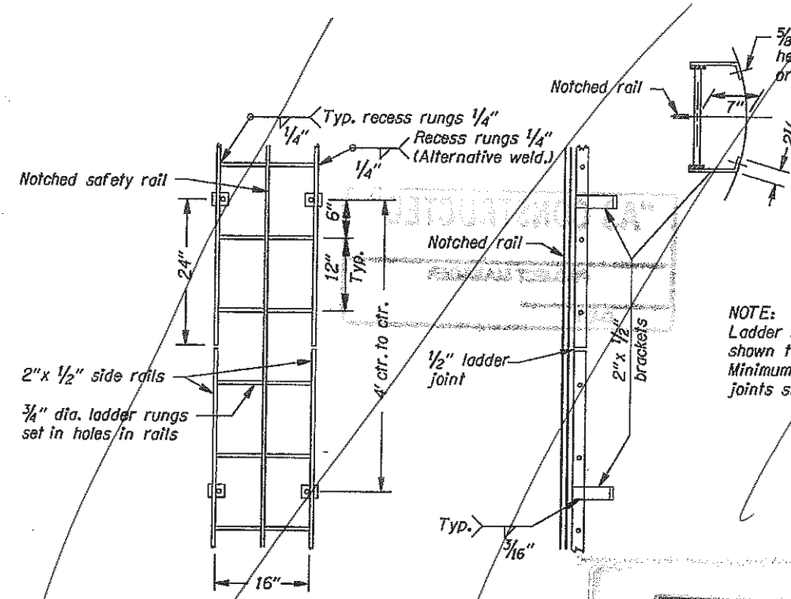
PLAN

Not to scale



SECTION A-A

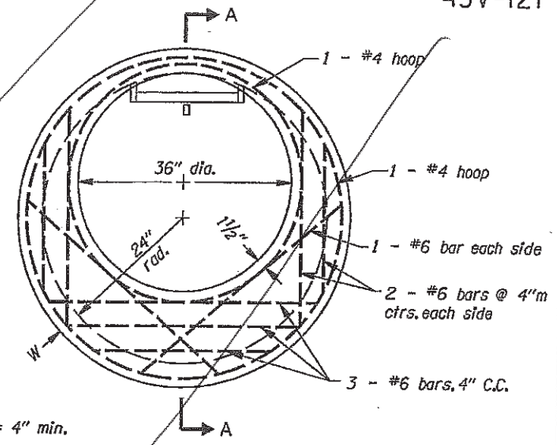
Not to scale



NOTE:
All structural steel shall be A36.
All bolts shall be A307.
All material shall be hot - Dipped galvanized after fabrication.

SAFETY LADDER

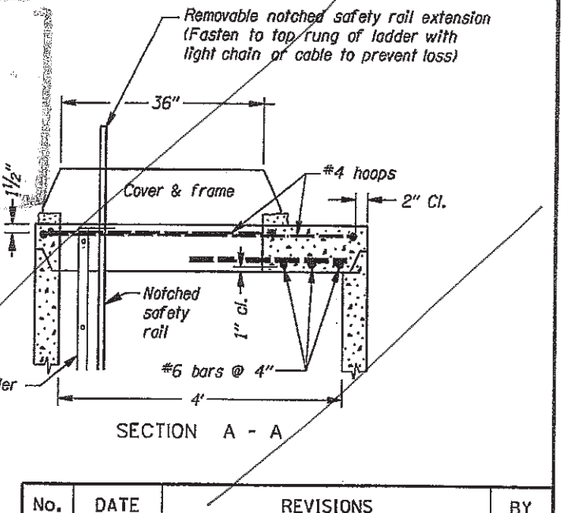
not used.



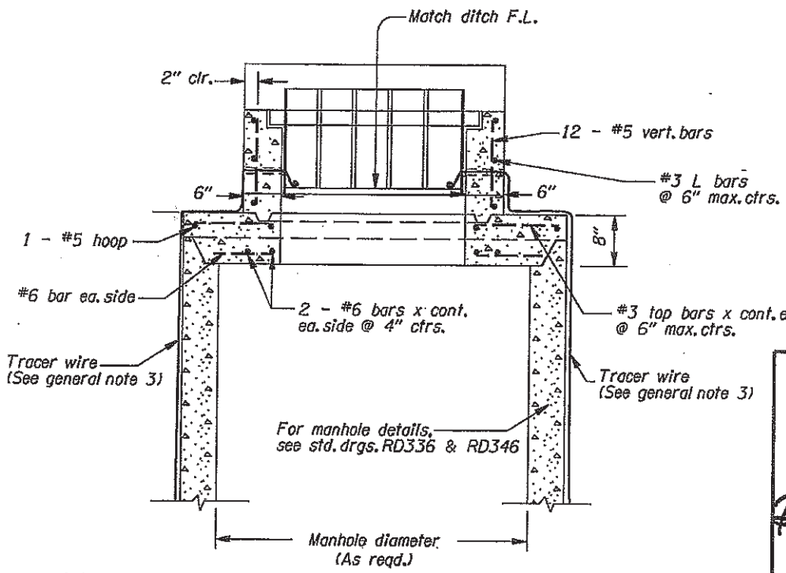
NOTE:
Ladder may be jointed as shown to permit galvanizing. Minimum spacing between joints shall be 16'.

TOP VIEW

"AS CONSTRUCTED"
Wayne A Stalter
PROJECT MANAGER
17 Dec 2012
DATE



SECTION A - A



SECTION B-B

Not to scale

No.	DATE	REVISIONS	BY
1	12-10-10	Edited general note	B.S.C.

GENERAL NOTES FOR MANHOLE W/TYPE "D" INLET DETAILS:
1. All reinforcement to be placed a minimum of 2" clear of nearest face of concrete unless otherwise shown or noted.
2. See std. drg. RD336 for manhole steps details.
3. See std. drg. RD336 for tracer wire details.
4. All precast sections shall conform to the requirements of ASTM C478.

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OREGON DEPARTMENT OF TRANSPORTATION

REGION 1 - Geo/Hydro/HazMat Unit

I-5: SW IOWA STREET VIADUCT BR*08197 SEC.
PACIFIC HIGHWAY
MULTNOMAH COUNTY

Reviewed By - Dan Gunther
Designed By - Bruce Council
Drafted By - Charlotte Gerken

DETAILS

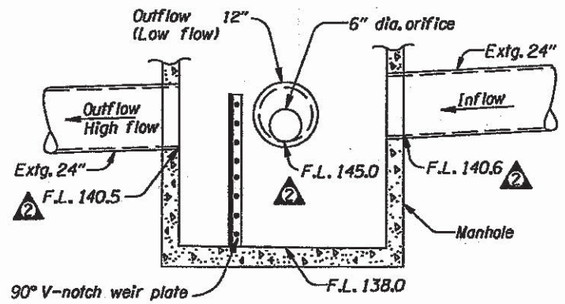
SHEET NO. GJ-5

1

"AS CONSTRUCTED"
Wayne A Statler
PROJECT MANAGER
17 DEC 2012
DATE

DIVERSION MANHOLE "HIGH-LOW", LOW FLOW TO SIDE

Sta. "I" 27+86.84, 56.73' Lt.



SECTION A-A
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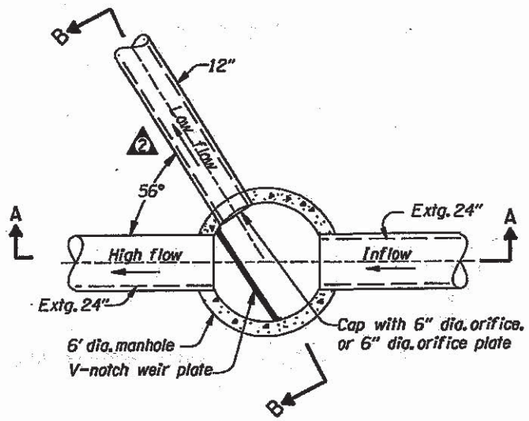
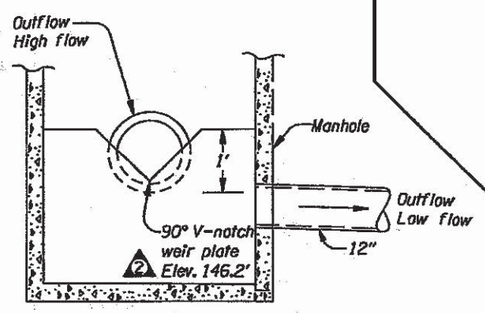


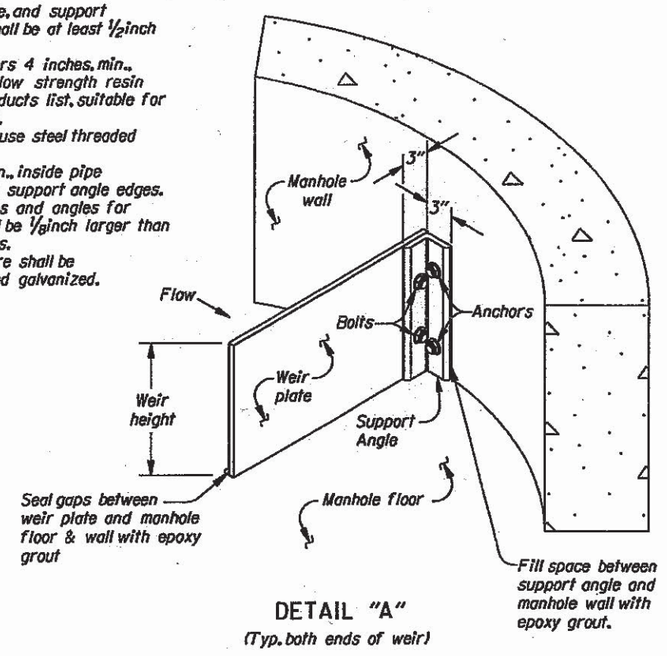
PLAN
Not to scale



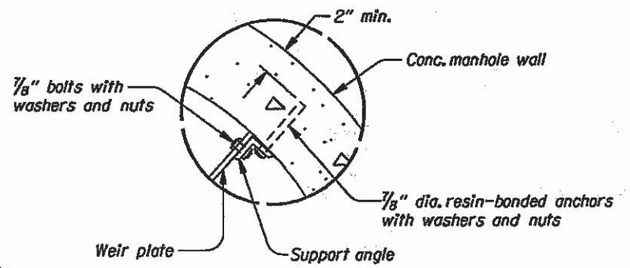
SECTION B-B
Not to scale

WEIR PLATE GENERAL DETAILS

Notes:
1. *When connecting to extg. pipes their sizes, types, and invert elevations are to be verified in the field.*
2. *Pipe crown plate, weir plate, and support angles shall be steel and shall be at least ½ inch thick, min.*
3. *Embed resin-bonded anchors 4 inches, min., into concrete. Use high or low strength resin from ODOT's qualified products list, suitable for wet or submerged locations.*
4. *For resin-bonded anchors, use steel threaded rods.*
5. *Anchors shall be 1 inch, min., inside pipe crown plate, weir plate, and support angle edges.*
6. *Hole diameters in the plates and angles for the anchors and bolts shall be ⅛ inch larger than the anchor or bolt diameters.*
7. *Metal plates and all hardware shall be stainless steel or hot-dipped galvanized.*



DETAIL "A"
(Typ. both ends of weir)



DETAIL "B"

No.	DATE	REVISIONS	BY
1	9-24-10	deleted diversion manhole split flow	S.B. for B.S.C.
2	9-24-10	Revised diversion manhole elevations & pipe angle	S.B. for B.S.C.

REGISTERED PROFESSIONAL ENGINEER
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OREGON
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OREGON DEPARTMENT OF TRANSPORTATION

REGION 1 - Geo/Hydro/HazMat Unit

I-5: SW IOWA STREET VIADUCT BR*08197 SEC.
PACIFIC HIGHWAY
MULTNOMAH COUNTY

Reviewed By - Dan Gunther
Designed By - Bruce Council
Drafted By - Charlotte Gerken

DETAILS

SHEET NO. GJ-6

43V-121

(1) Const. inlet protection - 2
(Type 3)

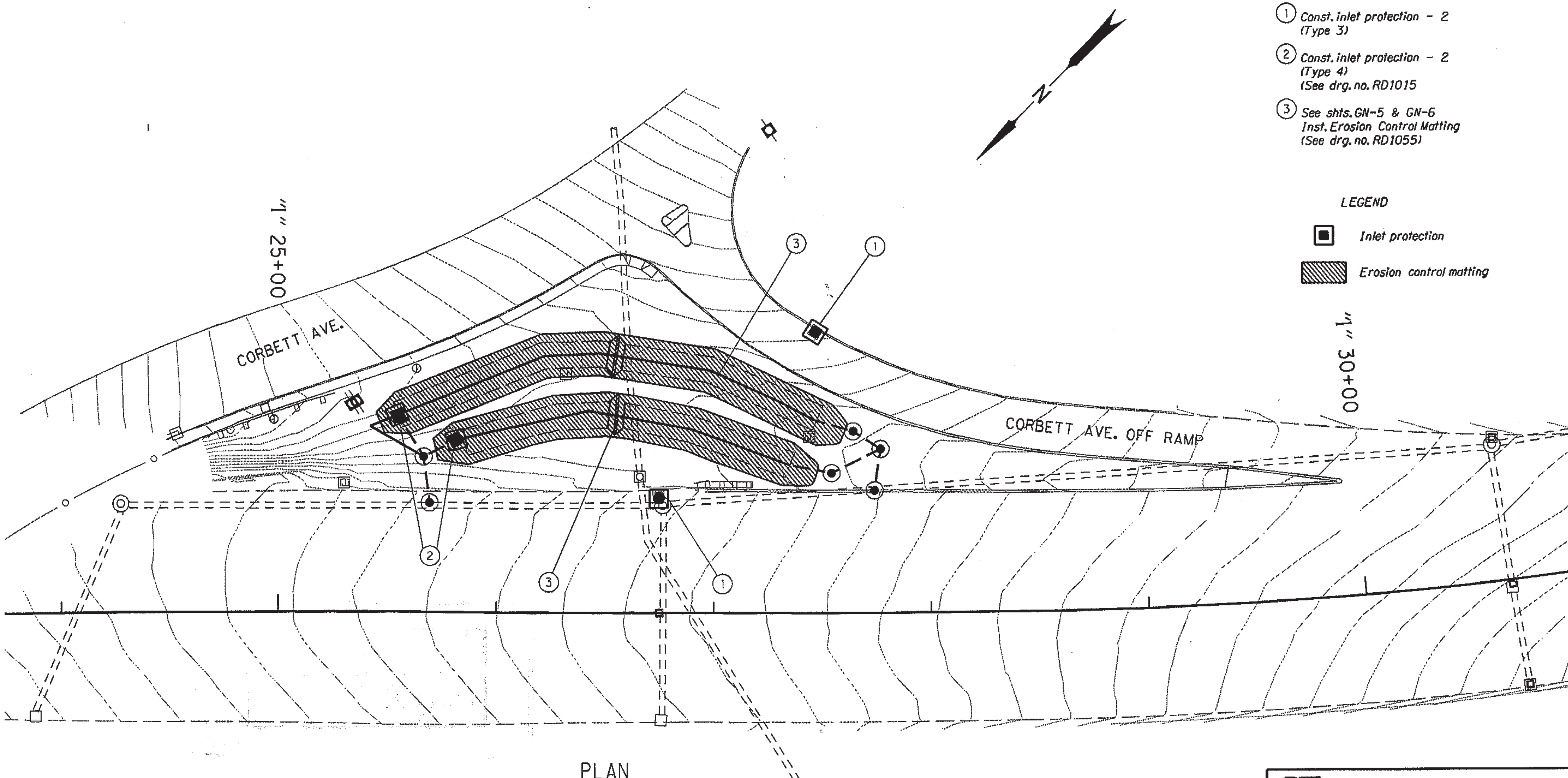
(2) Const. inlet protection - 2
(Type 4)
(See drg. no. RD1015

(3) See shts. GN-5 & GN-6
Inst. Erosion Control Matting
(See drg. no. RD1055)

LEGEND

Inlet protection

Erosion control matting



PLAN
1"=50'

"AS CONSTRUCTED"
Wayne A. Statler
PROJECT MANAGER
15 JAN 2012
DATE

REGISTERED PROFESSIONAL ENGINEER
19156
OREGON
JULY 15, 1997
BRUCE S. COUNCIL
RENEWAL DATE: 12-31-2011

OREGON DEPARTMENT OF TRANSPORTATION

REGION 1 - Geo/Hydro/HazMat Unit

I-5: SW IOWA STREET VIADUCT BR#08197 SEC.
PACIFIC HIGHWAY
MULTNOMAH COUNTY

Reviewed By - Don Gunther
Designed By - Bruce Council
Drafted By - Charlotte Gerken

EROSION CONTROL PLAN

SHEET NO.
GJ-7