OPERATION & MAINTENANCE MANUAL

DFI No.: D00163
Facility Type: Detention Pond/Water Quality Biofiltration Swale Combo

JULY, 2011

INDEX

1. Identification

Drainage Facility ID (DFI):	**DFI D00163**
Facility Type:	Detention Pond/Water Quality Biofiltration Swale Combo
Construction Drawings:	(V-File Number) 37V-023
Location:	District: 01 (Old 2A)
	Highway No.: 092
	Mile Post: 21.23/21.25 (beg./end)
	Description: This facility is west of the Lower Columbia River Highway (US30 / Hwy 092) and south of the intersection of US30 and Scappoose-Vernonia Road. Access is obtained from a maintenance access road off the southbound lanes of US30.

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:	ODOT Designer – Region 1 Tech. Center, Timothy P. Fredette, P.E., (503) 731-8340
Facility Construction:	2004
Contractor:	Eagle-Elsner, Inc.

4. Storm Drain System and Facility Overview

A detention pond/water quality biofiltration swale combo (referred to from this point forward as a pond/swale combo) combines the forms and functions of a water quality swale and a detention pond. In a pond/swale combo, the biofiltration swale is situated within the bottom confines of the detention facility. The facility provides water quality treatment of the smaller storm events and detention of the larger storm events.

The biofiltration swale is designed as if it was a separate facility and consists of a grassy-lined facility with a flat trapezoidal cross section and gradual slope. Treatment is provided through sedimentation and filtration processes. If amended soils are present, additional treatment is obtained through infiltration through the amended soil media.

When the flows exceed the water quality flows, the pond/swale combo facility begins to provide detention. Detention is required to reduce or mitigate the increases in discharge, resulting from development. The facility is designed to store and gradually release (or attenuate) stormwater runoff via a control structure or release mechanism, then releasing it slowly over a more extended period of time. The flow control mechanism for this facility involves a 4-inch orifice surrounded by a wirecloth strainer assembly. When flows exceed the water quality design flow, the orifice restricts the flow causing the water to backup within the facility.

This particular facility is located southwest of the intersection of Scappoose-Vernonia Road and US30 (Hwy 092). Access to this facility is obtained from a maintenance access road off the southbound lanes of US30 (Hwy 092) (**Point D on Operational Plan in Appendix A; Photo 3**).

The contributing drainage area consists of the southbound lanes of US30 (Hwy 092), extending 450 feet south of the intersection. All runoff collected by the associated drainage system is directed to the detention pond/swale facility. Therefore, the detention pond/swale facility can be described as "online." The drainage system does not include offline bypasses.

The detention pond/swale facility is approximately 82-feet in length from north to south, and its bottom width is 8-feet. The facility is lined with HDPE porous pavers and grass.

Stormwater enters the detention pond/swale facility from a 15-inch pipe and outfalls onto riprap located at the facility's southern end (**Point A; Photo 1**). After treatment, water exits the detention pond/swale facility through the outlet structures at the facility's northern end (**Point B; Photo 5**). Treated water enters the outlet structures through the lower ditch inlet.

The water exits the lower ditch inlet via an 8-inch diameter siphon pipe. From the siphon pipe, the water is discharged through a 2-inch diameter orifice into the higher ditch inlet. From the higher ditch inlet the water is discharged into a 15-inch storm pipe, which ties into an 18-inch CMP storm pipe at a manhole (**Point C**). Subsequently, the water is conveyed westward by storm pipes to a stormwater outfall.

A. Maintenance equipment access:
Access to this swale facility is obtained from a maintenance access road off the southbound lanes of US30 (Hwy 092) (**Point D; Photo 3**).

B. Heavy equipment access into facility:

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

C. Special Features:

☐ Amended Soils
☒ Porous Pavers – HDPE Porous Pavers
☐ Liners
☐ Underdrains

Photo 1: 15-inch storm pipe outfall serving as swale inlet at south end of swale (**Point A**).

Photo 2: Water quality biofiltration swale. Photo taken facing north toward the swale outlet.

Photo 3: Maintenance access road (**Point D**). Photo taken facing north.

Photo 4: Water quality biofiltration swale. Photo taken facing south.

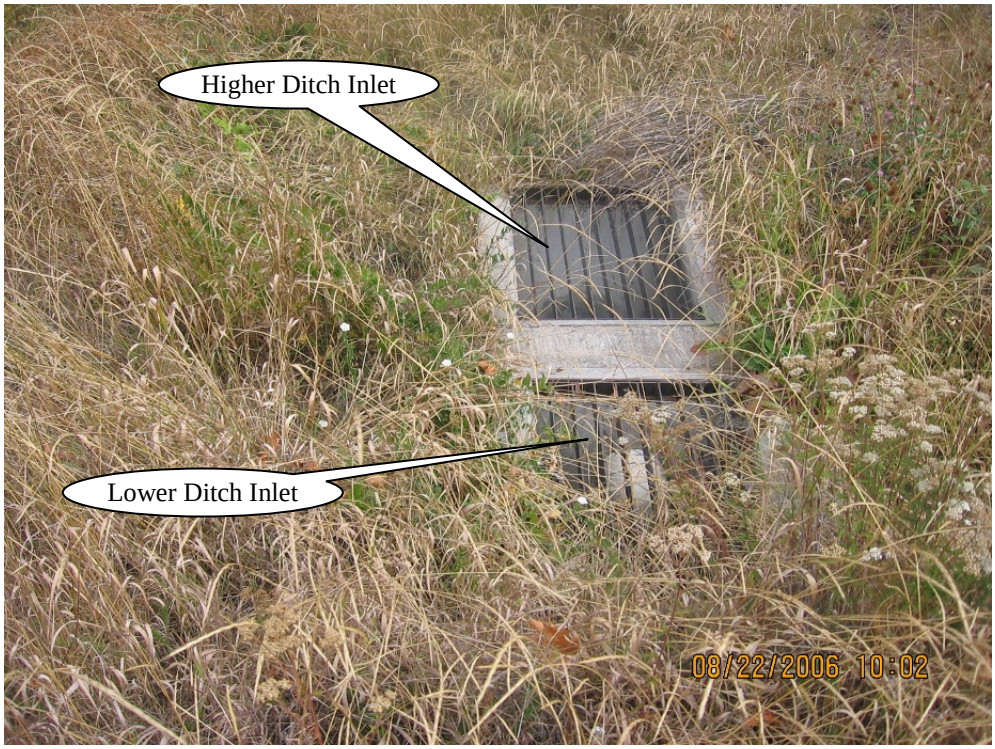


Photo 5: Outlet structures at water quality biofiltration swale outlet (**Point B**).

5. Facility Haz Mat Spill Feature(s)

The detention pond/water quality biofiltration swale combination facility can be used to store a volume of liquid by using plates or sandbags to block either the inlet grates or the higher ditch inlet's 15-inch diameter pipe located at the outlet structures (**Point B; Photo 5**).

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 treatment 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 – This swale is an online facility where both the treatment and the high flows are directed into the swale. If runoff exceeds the capacity of the swale, the excess volume bypasses the lower inlet, the siphon pipe and the orifice. And, the excess volume exits the swale via the higher inlet of the swale outlet structures (**Point B; Photo 5**).

☐ Other, as noted below

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

Maintenance requirements for proprietary structures, such as underground water quality manholes and/or vaults with filter media are noted in Appendix C when applicable.

The following stormwater facility maintenance table (See ODOT Maintenance Guide) should be used to maintain the facility outlined in this Operation and Maintenance Manual or follow the Maintenance requirements outlined in Appendix C when proprietary structure is selected below:

☒ 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:

Note: Special maintenance Requirements Require Concurrence from ODOT SR Hydraulics Engineer.

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

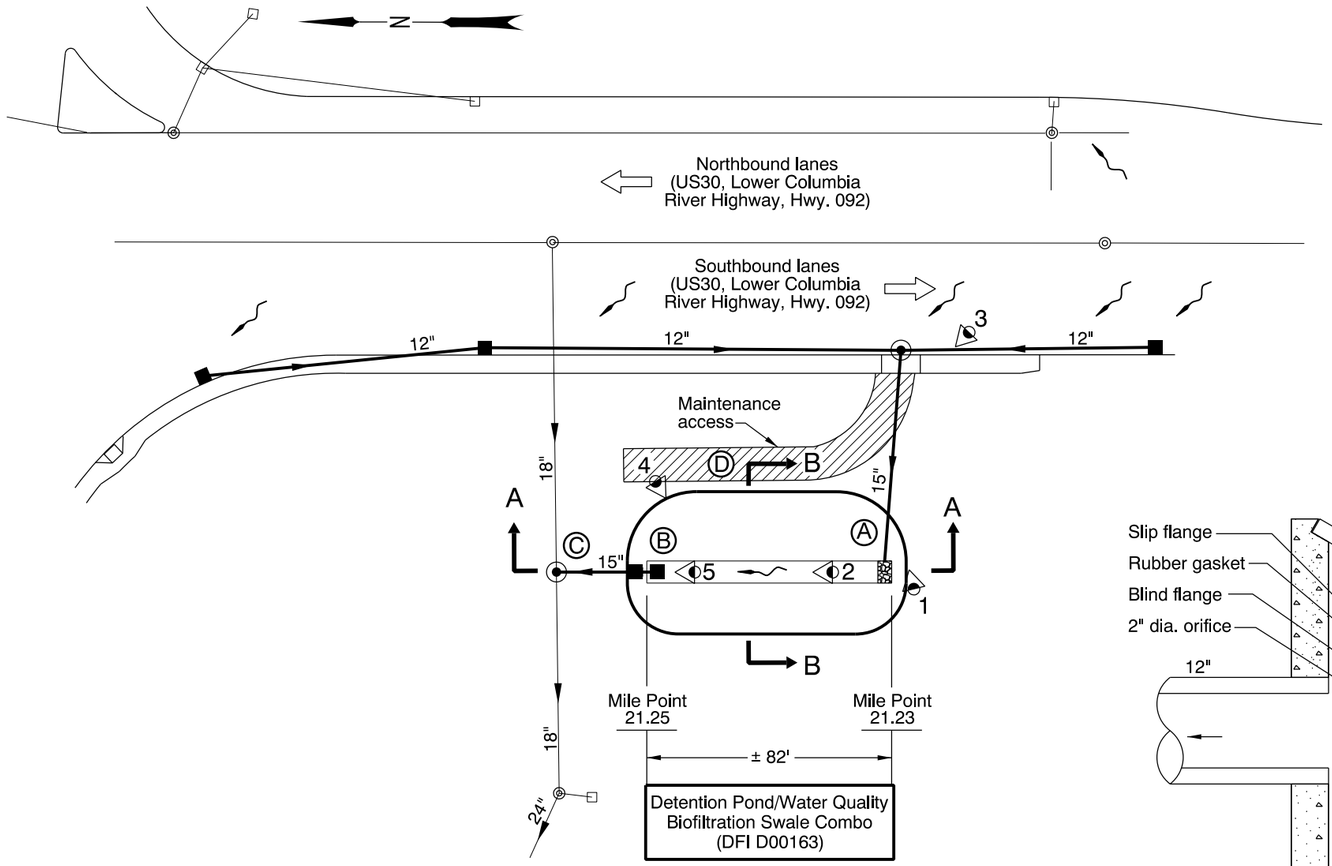
Contact any of the following for more detailed information about management of waste materials found on site:

ODOT Clean Water Unit	(503) 986-3008
ODOT Statewide Hazmat Coordinator	(503) 229-5129
ODOT Region Hazmat Coordinator	(503) 731-8304
ODEQ Northwest Region Office	(503) 229-5263

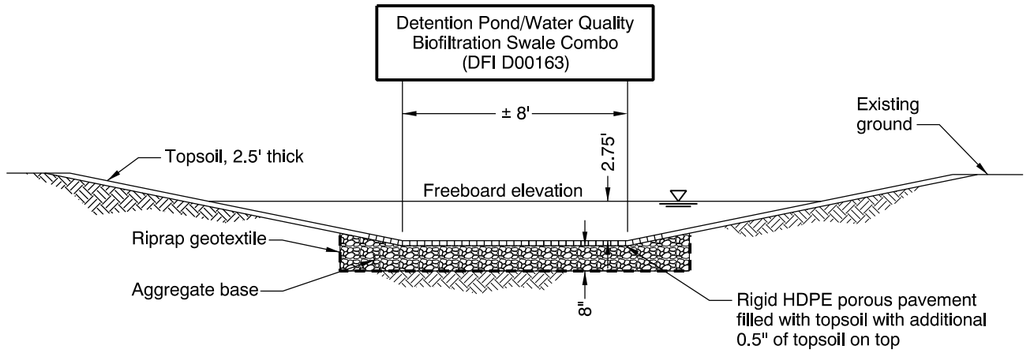
Appendix A

Content:

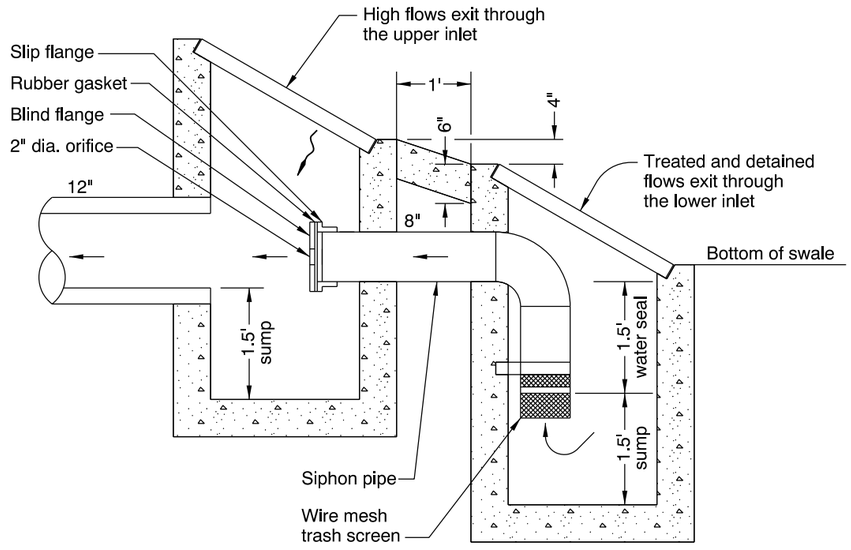
- **Operational Plan and Profile Drawing(s)**



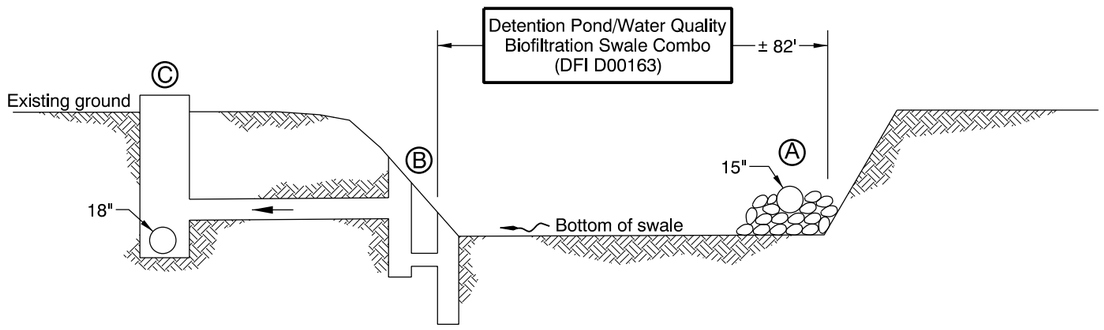
PLAN
N.T.S.



SECTION B-B
N.T.S.



SWALE OUTLET STRUCTURES FOR
DETENTION POND / WATER QUALITY
BIOFILTRATION SWALE AT POINT Ⓑ
N.T.S.



SECTION A-A
N.T.S.

LEGEND:

- Photo Location / Direction
- Ⓐ Pipe Outfall at Swale Inlet with Riprap Flow Spreader
- Ⓑ Swale Outlet Structure
- Ⓒ Manhole Connecting Facility to Conveyance Line
- Ⓓ Maintenance Access Rd.
- Manhole (and / or)
- Inlet (and / or)
- Traffic Flow / Direction
- Storm Pipe (Facility)
- Storm Pipe
- Conveyance Direction
- Pavement / Facility Flow Path
- Riprap
- Maintenance Access

Sht. 1 of 1

OREGON DEPARTMENT OF TRANSPORTATION

Prepared By: Wynee Hu

Drafted By: S. Wolfer

DFI D00163
MAINTENANCE DISTRICT 1 HWY 092
DETENTION POND/WQ SWALE COMBO
LOWER COLUMBIA R HWY MP 21.23-21.25
COLUMBIA COUNTY

Appendix B

Content:

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

37V-23

STATE OF OREGON

DEPARTMENT OF TRANSPORTATION

PLANS FOR PROPOSED PROJECT

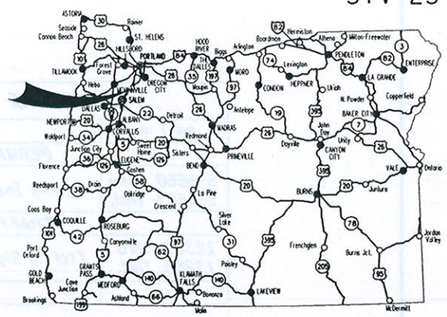
REVISED AS CONSTRUCTED
12-15-04 CONTRACT 12964
PROJ. MGR. MARJORIE J. WEST
Marjorie West

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

US30: LOWER COLUMBIA RIVER HIGHWAY AT SCAPPOOSE - VERNONIA ROAD

LOWER COLUMBIA RIVER HIGHWAY

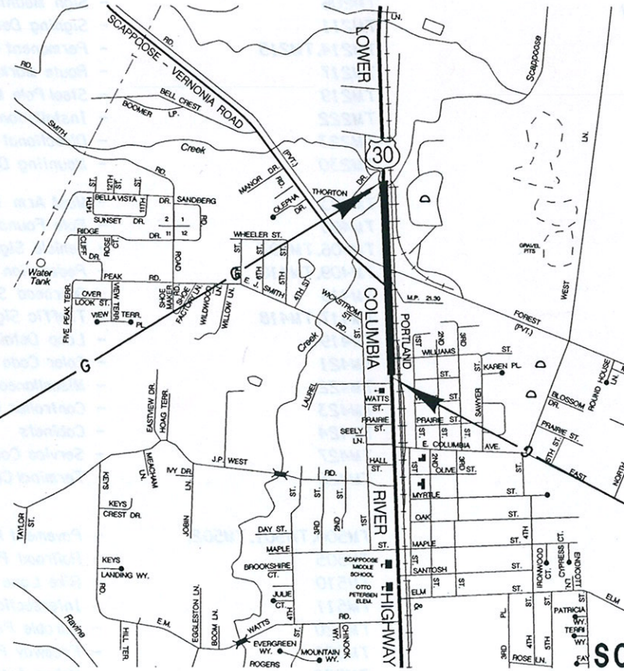
COLUMBIA COUNTY
FEBRUARY 2004



Overall Length Of Project - 0.70 km (0.43 Miles)

INDEX OF SHEETS	
SHEET NO.	DESCRIPTION
1	Title Sheet
1A	Index of Sheets, Con't.
2, 2A Thru 2A-4 Incl.	Typical Sections
2B Thru 2B-4 Incl.	Details
2C	Traffic Control Details
2C-2 Thru 2C-9 Incl.	Traffic Control Plans
2D	Pipe Data Sheet
3	Alignment
3A	General Construction
3B	Construction Notes
3C	Drainage & Utilities
3D	Profile
3E	Waterline & Utilities
4	Alignment
4A	General Construction
4B	Drainage & Utilities
PERMANENT PAVEMENT MARKINGS	
ST-1, ST-2	Striping Plans
ROADSIDE DEVELOPMENT	
R1, R2	Plant List
R3	Plant Details
R4, R5	Planting Plan
GEO/HYDRO	
GHA-1, GHA-2	Erosion Control
GHG-1	Temporary Water Management Details
GHH-1	Streambank Stabilization
GHJ-1	Water Quality Plan
GHJ-2 Thru GHJ-4 Incl.	Water Quality Details
GHJ-5	Details

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.)



T. 3 N., R. 2 W., W.M.

OREGON TRANSPORTATION COMMISSION

Stuart Foster	CHAIRMAN
Gail L. Achterman	COMMISSIONER
Michael Nelson	COMMISSIONER
Randall Papé	COMMISSIONER
John Russell	COMMISSION
Bruce A. Warner	DIRECTOR OF TRANSPORTATION

REGISTERED PROFESSIONAL ENGINEER
13,704
OREGON
JULY 16, 1987
CATHERINE M. NELSON
Expires Dec. 31, 2004

Catherine M. Nelson

STATE HIGHWAY ENGINEER

US30: LOWER COLUMBIA RIVER HIGHWAY AT SCAPPOOSE - VERNONIA ROAD
LOWER COLUMBIA RIVER HIGHWAY
COLUMBIA COUNTY

FEDERAL HIGHWAY ADMINISTRATION		PROJECT NUMBER	SHEET NO.
REGION 10	OREGON DIVISION	X-NH-S092(6)	1

THIS IS THE FILE NAME LOCATION projects\Scappoose\ 10733\As Constructed\ 10733rl.tsln

VIEW 1

VIEW 1

35V-168

Sec. 12, T. 3N, R. 2W, W.M.
CITY OF SCAPPOOSE

REVISED AS CONSTRUCTED
12-15-04 CONTRACT 12964
Marjorie West

BEGINNING OF PROJECT X-NH-S092(6)
STA. "LC" 34+620

END OF CONTRACT
STA. "C" 0+280.7

"LC" 34+600
"LC" 34+700
"LC" 34+800
"LC" 34+900
"C" 0+300
"C"0+350.054 P.T.
"C"0+301.767 P.C.
"C" 150.000 m C.R.
R 18°26'40"
Δ 24.354 m
T

BURLINGTON NORTHERN RAILROAD
1.5 m Cyclone
Railroad Ballast
Railroad Ballast
+960

"LC" Line
(For Profile, See Sht. 3D)
R/W
S.01°55'42" E.
S.85°55'42" E.
"LC" 34+846.005 P.O.T. =
"C" 0+251.895 P.O.T.
S.01°55'42" E.

"C"0+239.017 P.T.
22 m
29 m
31 m
25 m
27 m
21.336 m
18 m
15.240 m
S.82°55'17" E.
4.2
Permanent Easement
Slopes
S.02°28'33" E.
"SAR" 34+952.104 P.O.T. =
"LC" 34+945.000, 12.3 m Rt.
"SAR" 34+948.732 P.T.
"SAR" 34+915.000 P.O.T. =
"LC" 34+915.000, 24.252 Rt.
Sewer Line Facilities
Perm. Ease. - Sewer Line Facilities
+909.863
+945
+960
"SAR" 10.000 m C.L.
R 80°26'42"
T 8.457
"SAR" 34+934.692 P.C.

R/W
10
+690
+695.0
+683 Asph.
+723
+827
Temporary Easement - Work Area
17.115
"C" 100.000 m C.L.
R 41°23'27"
T 37.778
"C"0+166.776 P.C.
"C"0+200
SCAPPOOSE - VERNONIA RD.
CROWN ZELLERBACH LOGGING RD.
S.67°29'02" E.
SOUTH SCAPPOOSE CREEK
CREEK
N

BEGINNING OF CONTRACT
STA. "C" 0+100
"C" Line
(For Profile, See Sht. 3D)
"C" 0+107.221 A.P.
Δ 0°11'20" Rt.
"C" 0+100
"C" 0+070.004 A.P.
Δ 5°05'40" Lt.
S.44°32'15" E.
S.44°20'55" E.
CROWN ZELLERBACH LOGGING RD.
SOUTH SCAPPOOSE CREEK
Enhancement
0.59 m Wood
Perm. Ease. - Riparian/Floodplain
Temp. Ease. - Access & Work Area
+914
+859
+878
+900

All Dimensions Are In Meters (m)
Unless Otherwise Noted.

REGISTERED PROFESSIONAL ENGINEER
19188PE
OREGON
JULY 15, 1997
LAM HAN
Expires June 30, 2005

OREGON DEPARTMENT OF TRANSPORTATION
ROADWAY ENGINEERING SECTION

US30: LOWER COLUMBIA RIVER HWY. AT SCAPPOOSE-VERNONIA RD. (SCAPPOOSE) SEC.
LOWER COLUMBIA RIVER HIGHWAY
COLUMBIA COUNTY

Project Leader - Sandy R. VanBemmel
Designed By - Lam Han
Drafted By - Martin G. Casillas

ALIGNMENT

SHEET NO. 3

THIS IS THE FILE NAME LOCATION projects\Scappoose\As Constructed\ 10733f.pl2

VIEW 1

REVISED AS CONSTRUCTED
12-15-04 CONTRACT 12964

"LC" 34+600

"LC" 34+700

"LC" 34+800

"LC" 34+900

"C"0+300

"C"0+200

"C"0+100

CROWN ZELLERBACH LOGGING RD.

BURLINGTON NORTHERN RAILROAD

"LC" Line
(For Profile, See Sht. 3D)

Paving Limits

Railroad Ballast

Railroad Ballast

R - 123.3 m

+960

16 m - R

22/80 m - R

7 m - R

7 m - R

35 m - R

1.5 m Cyclone

Temporary Easement - Work Area

Toe Of Slope

Toe Of Slope

Toe Of Slope

16/65 m - R

Taper 15:1

+1915
End Taper

Permanent Easement - Slopes

Sewer Line Facilities

Perm. Ease. - Sewer Line Facilities

SOUTH SCAPPOOSE CREEK

SOUTH SCAPPOOSE CREEK

Basin Taper

Enhancement

0.59 m Wood

Perm. Ease. - Riparian/Floodplain

Temp. Ease. - Access & Work Area

Asph.

+683

+690

+695.0

+723

+731.0

+771.5

+827

+869

+878

+945

+960

+1915

+960.363

All Dimensions Are In Meters (m)
Unless Otherwise Noted.

REGISTERED PROFESSIONAL ENGINEER
19188PE
OREGON
JULY 15, 1997
LAM HAN
Expires June 30, 2005

OREGON DEPARTMENT OF TRANSPORTATION
ROADWAY ENGINEERING SECTION

US30: LOWER COLUMBIA RIVER HWY. AT SCAPPOOSE-VERNONIA RD. (SCAPPOOSE) SEC.
LOWER COLUMBIA RIVER HIGHWAY
COLUMBIA COUNTY

Project Leader - Sandy R. VanBemmel
Designed By - Lam Han
Drafted By - Martin G. Casillas

GENERAL CONSTRUCTION

SHEET NO. 3A

VIEW 3

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REVISED AS CONSTRUCTED
12-15-04 CONTRACT 12964
Marjorie West

① Sta. "LC" 34+834.0 To "LC" 34+841.1 Lt.
Const. Standard Conc. Curb
Const. P.C. Conc. Walk
Const. Sidewalk Ramp
(For Details, See Sht. 2B-4)
(See Drg. Nos. RD700 & RD725)

② Sta. "LC" 34+860.0 To "LC" 35+230 Lt.
Const. Standard Conc. Curb

⑳ Const. P.C. Conc. Walk
Const. Sidewalk Ramp
(For Details, See Sht. 2B-3)

③ Sta. "LC" 34+853.75 To "LC" 34+865.32 Lt.
Const. P.C. Conc. Island, Accesible Route - 47.5 m^2
Const. Standard Conc. Curb
(For Details, See Sht. 2B)
(See Drg. Nos. RD705 & RD710)

④ Sta. "LC" 34+851.0 To "LC" 34+960.0 Rt.
Const. Standard Conc. Curb
Const. Sidewalk Ramp
Const. P.C. Conc. Walk
(Match Extg. P.C. Conc. Walk)
(For Details, See Sht. 2B-2)

⑤ Sta. "LC" 34+945 Rt.
Const. Access Road
(For Details, See Sht. GHJ-1)

⑥ Sta. "LC" 34+945, Rt.
Const. P.C. Conc. Dwy.
(For Details, See Sht. 2B-2)
(See Drg. No. RD730)

⑦ Sta. "LC" 34+850.33 To "LC" 34+859.78 Rt.
Const. P.C. Conc. Island, Accessible Route - 38.5 m^2
Const. Standard Conc. Curb
(For Details, See Sht. 2B)

⑧ Sta. "LC" 828.04 To "LC" 34+837.92 Rt.
Const. P.C. Conc. Island, Accessible Route - 44 m^2
Const. Standard Conc. Curb
(For Details, See Sht. 2B)

⑨ Sta. "C" 0+140 To "C" 0+160 Lt.
Const. Guardrail - 3.81 m (Type 2A)
Const. Guardrail Terminal, Flared - W=1.22 m
Const Guardrail To Bridge Transition
(See Drg. Nos. RD425 & BR203)

⑩ Sta. "C" 0+143 To "C" 0+205 Rt.
Const. Cast In Place Concrete Barrier
Transition To Bridge Rail - 11.43 m
(RD520)
Transition From Barrier With Terminal
Connection (BR236)
Const. Guardrail Terminal, Non-Flared
7.62 m
Const. Guardrail - 22.86 m (Type 2A)
Extra For 2.4 m Post - 23

⑪ Sta. "C" 0+106 To "C" 0+116 Rt.
Const. Cast In Place Concrete Barrier
Transition To Bridge Rail @ a 9:1 Taper
4.5 m (RD520)
Transition From Barrier With Terminal
Connection (BR236)
Const. Guardrail (Type 4) 3.0 m Radius
3.81 m (RD410)
Install End Piece (Type B)

⑫ Sta. "C" 0+100 To "C" 0+111.5 Lt.
Const. Guardrail - 3.81 m (Type 2A)
Const. Guardrail Terminal, Non-Flared
Const Guardrail To Bridge Transition

⑬ Sta. "LC" 34+683, Rt.
Const. A.C. Appr.
(See Drg. No. RD715)

⑮ Const. Special Stone Embankment
(For Details, See Sht. GHJ-5)

All Dimensions Are In Meters (m)
Unless Otherwise Noted.

REGISTERED PROFESSIONAL ENGINEER
19188PE
OREGON
JULY 15, 1997
LAM HAN
Expires June 30, 2005

OREGON DEPARTMENT OF TRANSPORTATION
ROADWAY ENGINEERING SECTION

US30: LOWER COLUMBIA RIVER HWY. AT SCAPPOOSE-VERNONIA RD. (SCAPPOOSE) SEC.
LOWER COLUMBIA RIVER HIGHWAY
COLUMBIA COUNTY

Project Leader - Sandy R. VanBemmel
Designed By - Lam Han
Drafted By - Martin G. Casillas

CONSTRUCTION NOTES

SHEET NO. 3B

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VIEW 4

VIEW 4

REVISED AS CONSTRUCTED
12-15-04 CONTRACT 12964
Maryrie Wast

(1) Sta. "LC" 34+961 Lt.
Const. Manhole In-Place
Const. Type "CG-2" Inlet
Inst. 300 mm Sewer Pipe - 4 m
1.5 m Depth
(See Drg. Nos., RD336 & RD366)

(2) Sta. "LC" 34+857.3 To "LC" 34+898.9 Lt.
Const. Manhole Over Extg. Pipe
Const. Type "CG-2" Inlet - 2
Const. Type "G-2MA" Inlet
Inst. 300 mm Sewer Pipe - 46 m
Inst. 375 mm Sewer Pipe - 9 m
1.5 m Depth

(4) Sta. "LC" 34+869.8 To "LC" 34+972.3 Rt.
Const. Manhole
Const. Type "CG-2" Inlet - 3
Inst. 300 mm Sewer Pipe - 102 m
1.5 m Depth
Inst. 375 mm Sewer Pipe - 24 m
1.5 m Depth

(6) Const. Water Quality Swale
(For Details, See Water Quality Shts.)

(7) Sta. "LC" 34+820 Lt.
Const. Pipe End Slope

(8) Relocate Utility Pole
1.2 m Behind Guardrail
(By Others)

"LC" 34+600
"LC" 34+700
"LC" 34+800
"LC" 34+900
"C" 0+300
"C" 0+200
"C" 0+100
"LC" Line
(For Profile, See Sht. 3D)
"C" Line
(For Profile, See Sht. 3D)
BURLINGTON NORTHERN RAILROAD
CROWN ZELLERBACH
CROWN ZELLERBACH LOGGING RD.
SCAPPOOSE - VERNONIA RD.
SOUTH SCAPPOOSE CREEK
SPRINT
WORLD COM F/O
MCI F/O
6" HP Gas
1.5 m Cyclone
Railroad Ballast
Temporary Easement - Work Area
Permanent Easement - Slopes
Riparian/Floodplain
Enhancement
Inlet
"MH"
"CG-2"
"G-2MA"
300 mm -8 m
300 mm -30 m
300 mm -4 m
300 mm -27 m
300 mm -45 m
375 mm -9 m
375 mm -24 m
375 mm -8 m
600 mm CMP
375 mm RCP
300 mm RCP
600 mm Conc.
0.59 m Wood
ST MH

All Dimensions Are In Meters (m)
Unless Otherwise Noted.

REGISTERED PROFESSIONAL ENGINEER
19188PE
OREGON
JULY 15, 1997
LAM HAN
Expires June 30, 2005

OREGON DEPARTMENT OF TRANSPORTATION
ROADWAY ENGINEERING SECTION

US30: LOWER COLUMBIA RIVER HWY. AT SCAPPOOSE-VERNONIA RD. (SCAPPOOSE) SEC.
LOWER COLUMBIA RIVER HIGHWAY
COLUMBIA COUNTY

Project Leader - Sandy R. VanBemmel
Designed By - Lam Han
Drafted By - Martin G. Casillas

DRAINAGE & UTILITIES

SHEET NO. 3C

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VIEW 1

35V-168

REVISED AS CONSTRUCTED
12-15-04 CONTRACT 12964

"LC" Line

34+640.000 15.311
34+680.000 15.560 80 m V.C.
34+720.000 16.173
34+800.000 17.410
160 m V.C.
34+880.000 17.810
34+920.000 18.010
80 m V.C.
34+960.000 18.332
35+000.000 18.555

Finished Grade
Extg. Ground Along ℄
0.621%
0.621%
1.541%
0.50%
0.806%

+869.8, Rt. Inlet
F.L. Elev. 16.65
Extg. 375 RCP
Extg. Inlet
F.L. Elev. 15.775
+866, Lt. M.H.
F.L. Elev. 15.900
-3.572%
300 mm - 8 m
+869.6, Lt. Inlet
F.L. Elev. 16.20
16.25
-0.43%
300 mm - 30 m
-1.08%
300 mm - 30 m
+874.9, Lt. Inlet
300 mm - 8 m
U TV
Extg. 375 RCP
+900.0, Rt. Inlet
F.L. Elev. 16.52
+899, Lt. Inlet
F.L. Elev. 16.52
-0.489%
300 mm- 45 m
+945, Rt. MH
F.L. Elev. 16.30
Extg. 375 RCP
+972.3, Rt. Inlet
F.L. Elev. 17.00
16.561
Extg. Inlet F.L. Elev. 16.531
16.521
-2.56%
300 mm- 27 m

Exc. 280 m³
Emb. In Place 680 m³

34+700 34+800 34+900 35+000

End Of Project 0+280.700

"C" Line

0+142.000 15.930
425 mm
Subgrade
Finished Grade
Extg. Ground Along ℄
1.073%
1.558%
U.S. 30

0+235.888 17.393
0+251.870 17.605
0+267.568 17.555
0+279.200 17.660
0+283.700 17.660
3 m V.C.
9 m V.C.
0.903%
0.000%
See Insert

0+350.000 17.800

Insert
0+267.568 17.555
0+279.200 17.660
0+283.700 17.660
3 m V.C.
9 m V.C.
-0.402%
0.903%
0.000%

0+100 0+200 0+300

All Dimensions Are In Meters (m)
Unless Otherwise Noted.

REGISTERED PROFESSIONAL ENGINEER
19188PE
OREGON
JULY 15, 1997
LAM HAN
Expires June 30, 2005

OREGON DEPARTMENT OF TRANSPORTATION
ROADWAY ENGINEERING SECTION

US30: LOWER COLUMBIA RIVER HWY. AT SCAPPOOSE-VERNONIA RD. (SCAPPOOSE) SEC.
LOWER COLUMBIA RIVER HIGHWAY
COLUMBIA COUNTY

Project Leader - Sandy R. VanBemmel
Designed By - Lam Han
Drafted By - Martin G. Casillas

PROFILE

SHEET NO. 3D

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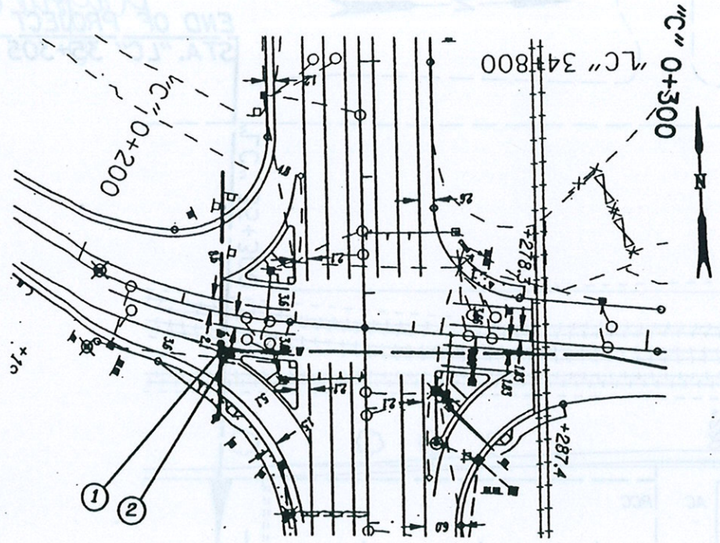
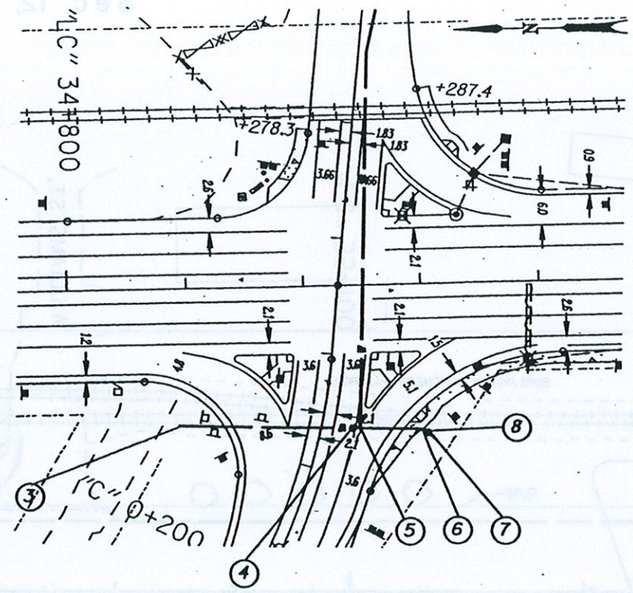
VIEW 4 VIEW 4





METRIC

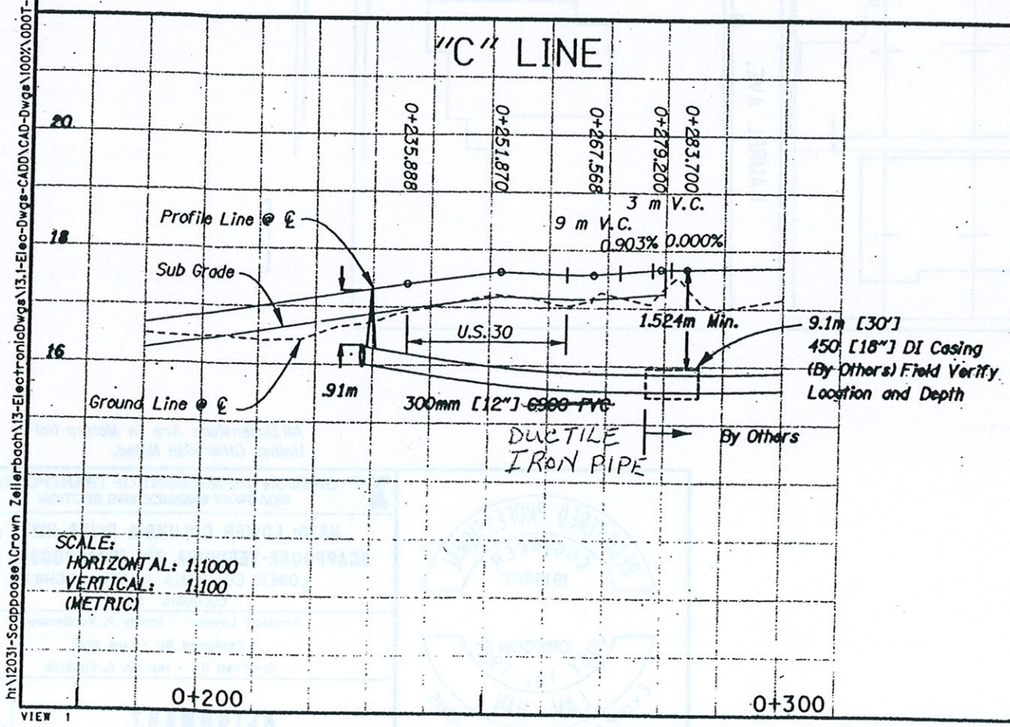
REVISED AS CONSTRUCTED
12-15-04 CONTRACT 12964

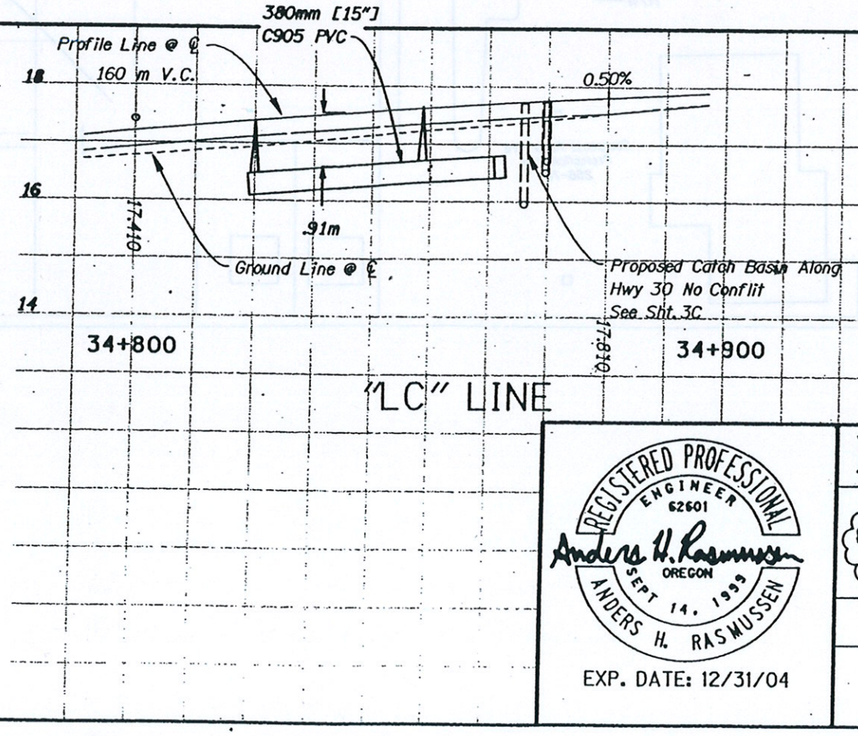
Δ2 ALL JOINTS ENCASED IN CTB

Δ3 CHANGE PVC TO DUCTILE IRON

1. "C" Sta: 0+228.23, 6.5m Rt. 380mm x 300mm [15"x12"] Tee
2. 300 mm (12") PVC Gate Valve And Valve Box Per ODOT Std Dwg. RD258
3. ~~Temporary~~ Blow Off Assembly See ODOT Std. Dwg. RD262 (Δ1)
4. 380 mm (12") PVC Gate Valve And Valve Box Per ODOT Std Dwg. RD258
5. "LC" Sta: 34+850, 24.8m Rt. 380mm x 300mm [15"x12"] Tee
6. "LC" Sta: 34+860.84, 25m Rt 45° Bend
7. Connect to Existing 200mm [8"] CI Water Line With Wet Tap. Field Verify Location And Depth
8. 200mm [8"] PVC Gate Vavle And Valve Box Per ODOT Std Dwg. RD258 And Reducer

NOTE:
For Trench Details, See ODOT Std Dwg. RD300





Δ Addendum No. 1 by AHR 12/05/03

REGISTERED PROFESSIONAL ENGINEER
62601
Anders H. Rasmussen
OREGON
SEPT 14, 1999
ANDERS H. RASMUSSEN

EXP. DATE: 12/31/04

HDR HDR Engineering, Inc.

US 30: LOWER COLUMBIA RIVER HWY. AT SCAPPOOSE - VERNONIA RD. (SCAPPOOSE) SEC.
LOWER COLUMBIA RIVER HIGHWAY
COLUMBIA COUNTY

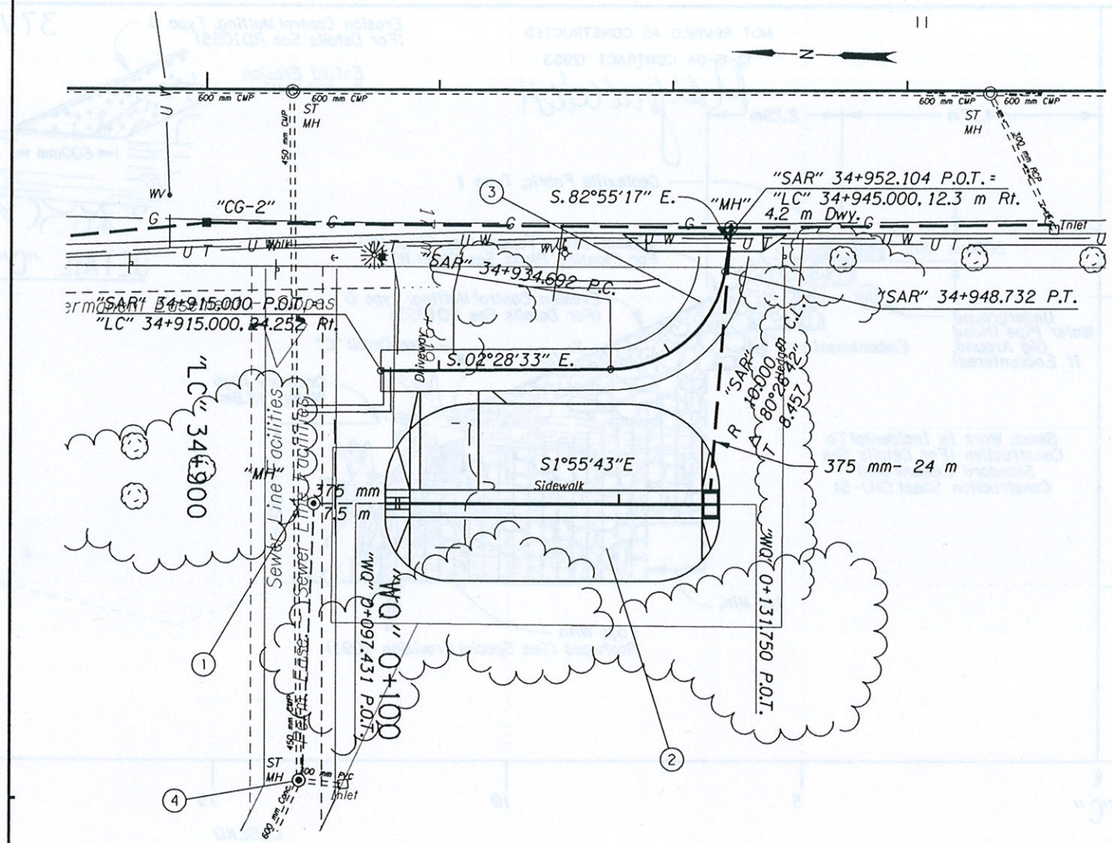
Design Team Leader - Kirk Hampson
Designed By - Scott Hale
Drafted By - Scott Hale and Paul Waggoner

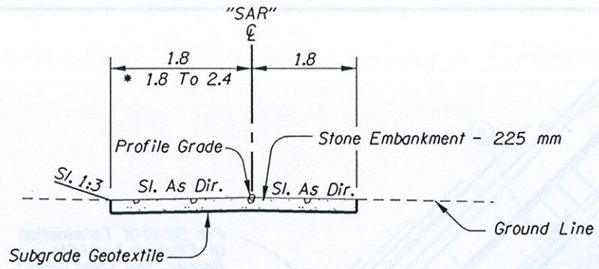
WATERLINE & UTILITIES

SHEET NO. 3E

h:\12031-Scappoose\Crown Zellerbach\13-Elec\ronicDwgs\13.1-Elec-Dwgs-CADD\CAD-Dwgs\100%\000T-3E.dgn 12/05/2003 01:39:40 PM

REVISED AS CONSTRUCTED
12-15-04 CONTRACT 12964
Mayone Likst





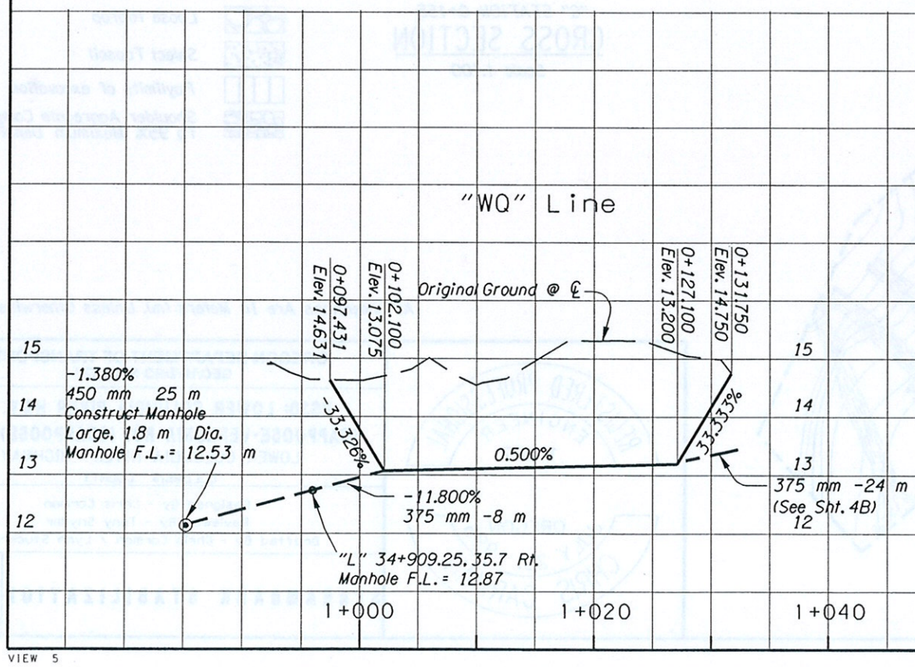
STA. "SAR" 34+918.5 To STA. "SAR" 34+950.0
* "SAR" 34+932.0 To "SAR" 34+950.0

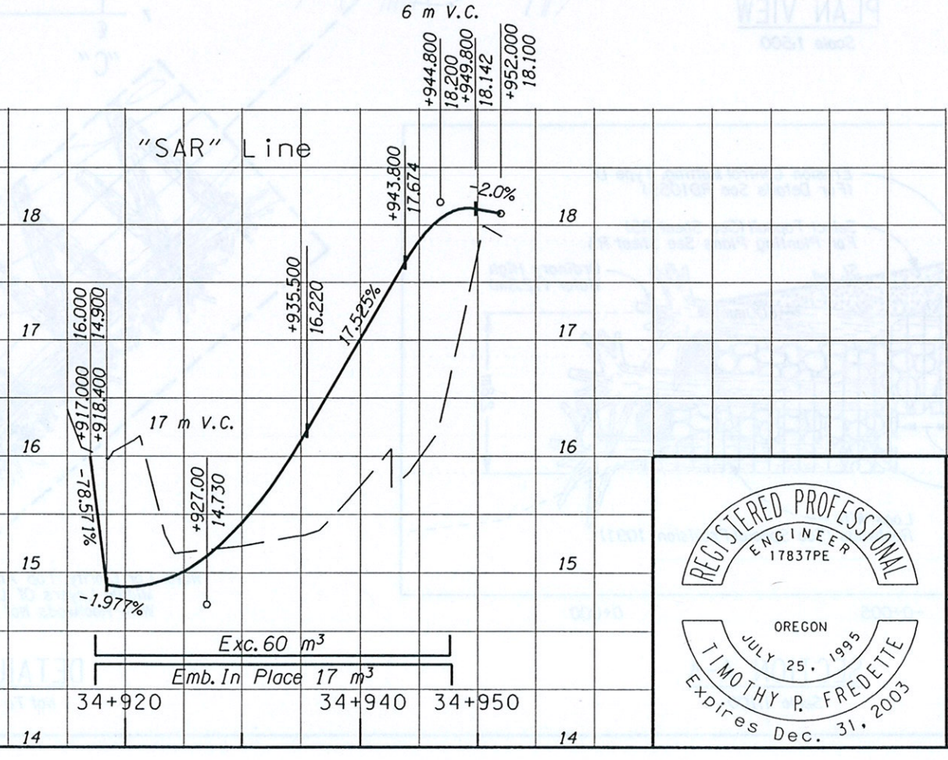
(1) Sta."L" 34+909.25, 35.7 m Rt.
Const. Manhole
F.L. = 12.87 m
Inst. 450 mm Sew. Pipe - 7.5 m

(2) Sta. "L" 34+912.83, 35.8 m Rt. = "WQ" 0+131.75 To
"L" 34+947.15, 35.8 m Rt. = "WQ" 0+097.43
Const. Water Quality Swale
Inlet Pipe F.L. = 13.26 m
Outlet Pipe F.L. = 12.975 m
(For Details, See Shts. GHJ-2, GHJ-3 & GHJ-4)

(3) Const. Access Road

(4) Sta."L" 34+908.1, 60.7 m Rt.
Const. Manhole Large, 1.8 m
F.L. = 12.53 m
Inst. 450 mm Sew. Pipe - 25 m





All Dimensions Are In Meters (m)
Unless Otherwise Noted.

REGISTERED PROFESSIONAL ENGINEER
17837PE
OREGON
JULY 25, 1995
TIMOTHY P. FREDETTE
Expires Dec. 31, 2003

OREGON DEPARTMENT OF TRANSPORTATION
GEO / HYDRO SECTION

US30: LOWER COLUMBIA RIVER HWY. AT
SCAPPOOSE-VERNONIA RD. (SCAPPOOSE) SEC.
LOWER COLUMBIA RIVER HIGHWAY
COLUMBIA COUNTY

Project Leader - Bret N. Richards
Designed By - Timothy P. Fredette
Drafted By - Martin G. Casillas

WATER QUALITY PLAN

SHEET NO. GHJ-1

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VIEW 5

VIEW 5

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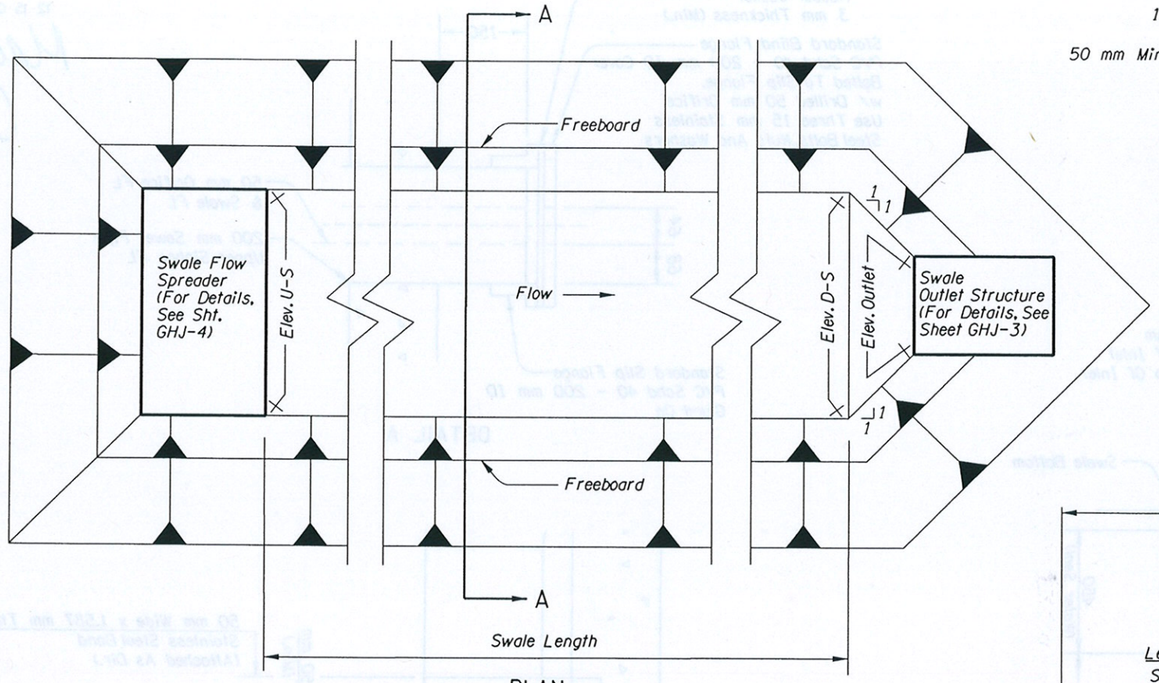
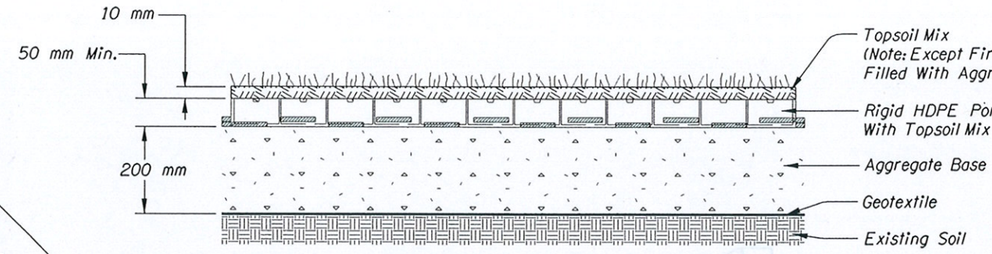
12-15-04 CONTRACT 12964

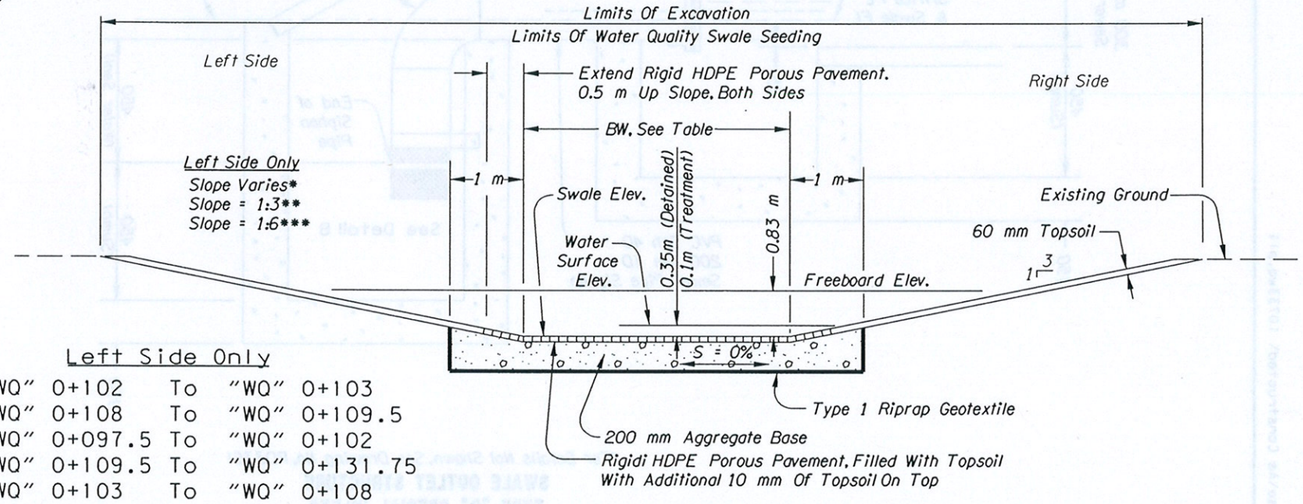


PLAN

Swale ID	Length	BW	Elev. U-S	Elev. D-S	Elev. Outlet	Side Slopes	
						Left Side	Right Side
A	25 m	2.4 m	13.200 m	13.075 m	12.975 m	1:3 to 1:6	1:3



RIGID HDPE POROUS PAVEMENT



SECTION A-A

Left Side Only

* "WQ" 0+102 To "WQ" 0+103
"WQ" 0+108 To "WQ" 0+109.5
** "WQ" 0+097.5 To "WQ" 0+102
"WQ" 0+109.5 To "WQ" 0+131.75
*** "WQ" 0+103 To "WQ" 0+108

Notes:
1) Aggregate Base: 19.0 mm - 0
2) Bottom Of Aggregate Is Level And Extends To 0.5 m Beyond Ends Of Rigid HDPE Porous Pavement.
3) Swale Elevation Shown On Profile Is At Top Of Topsoil Above Rigid HDPE Porous Pavement.
4) If Rock Is Encountered, Maintain Slopes And Soil Structure Up To Freeboard Elevation As Shown. Above Freeboard, Slopes May Assume Stable Slope For Rock Formation.

All Dimensions Are In Millimeters (mm) Unless Otherwise Noted.

REGISTERED PROFESSIONAL ENGINEER
17837PE
OREGON
JULY 25, 1995
TIMOTHY P. FREDETTE
Expires Dec. 31, 2003

OREGON DEPARTMENT OF TRANSPORTATION
GEO / HYDRO SECTION

US30: LOWER COLUMBIA RIVER HWY. AT SCAPPOOSE-VERNONIA RD. (SCAPPOOSE) SEC.
LOWER COLUMBIA RIVER HIGHWAY
COLUMBIA COUNTY

Project Leader - Bret N. Richards
Designed By - Timothy P. Fredette
Drafted By - Martin G. Casillas

WATER QUALITY DETAILS

SHEET NO. GHJ-2

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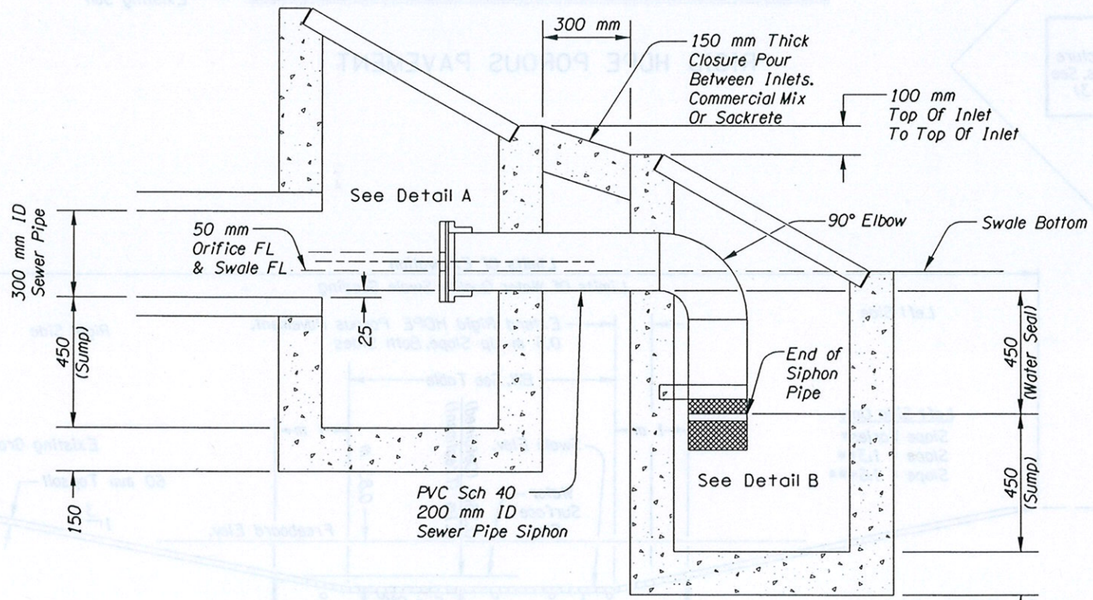
VIEW 4

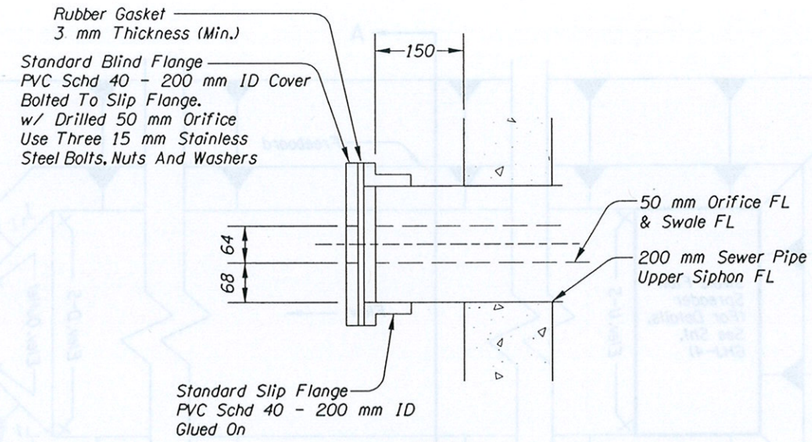
VIEW 4

REVISED AS CONSTRUCTED
12-15-04 CONTRACT 12964
Marjorie West

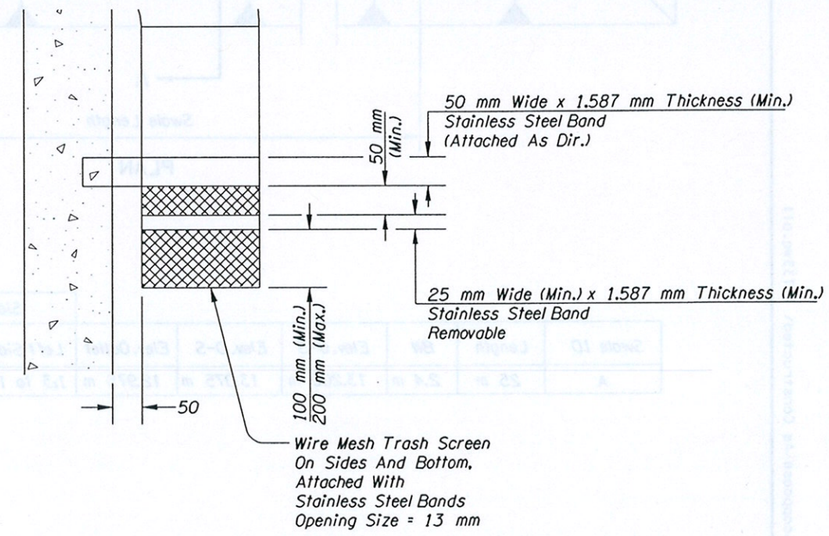


(For Details Not Shown, See Drawing No. RD336)

SWALE OUTLET STRUCTURE
TYPE "D" SPECIAL INLETS



DETAIL A



DETAIL B

All Dimensions Are In Millimeters (mm)
Unless Otherwise Noted.

REGISTERED PROFESSIONAL ENGINEER
17837PE
OREGON
JULY 25, 1995
TIMOTHY P. FREDETTE
Expires Dec. 31, 2003

OREGON DEPARTMENT OF TRANSPORTATION
GEO / HYDRO SECTION

US30: LOWER COLUMBIA RIVER HWY. AT SCAPPOOSE-VERNONIA RD. (SCAPPOOSE) SEC.
LOWER COLUMBIA RIVER HIGHWAY
COLUMBIA COUNTY

Project Leader - Bret N. Richards
Designed By - Timothy P. Fredette
Drafted By - Martin G. Casillas

WATER QUALITY DETAILS

SHEET NO.
GHJ-3

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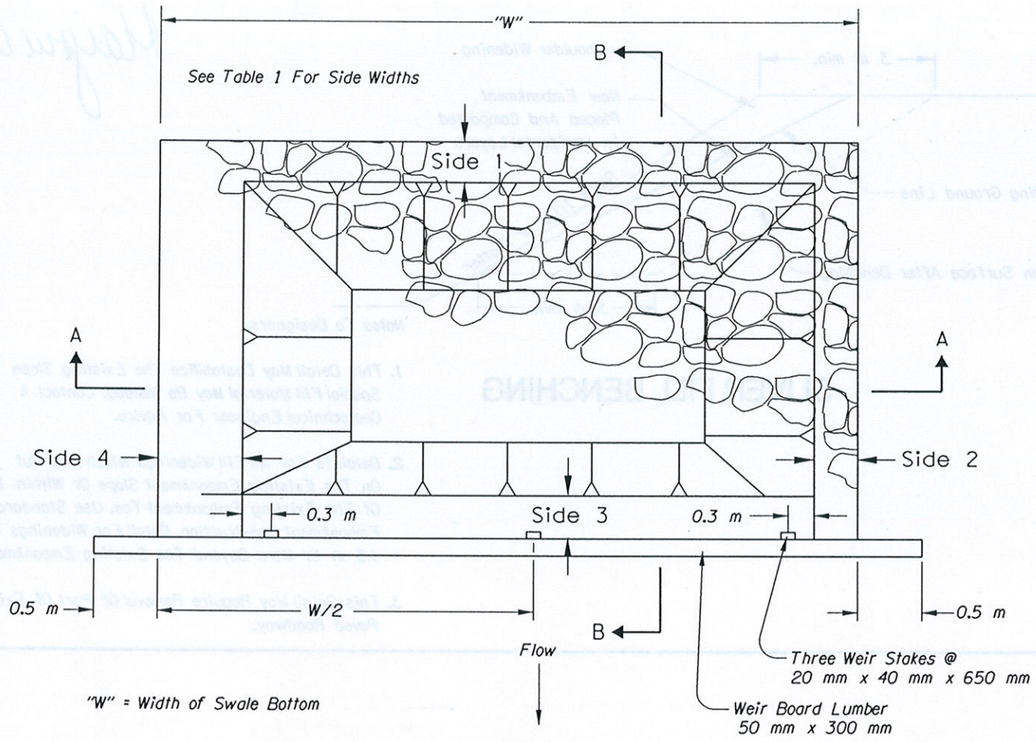
VIEW 3

VIEW 3

REVISED AS CONSTRUCTED
12-15-04 CONTRACT 12964

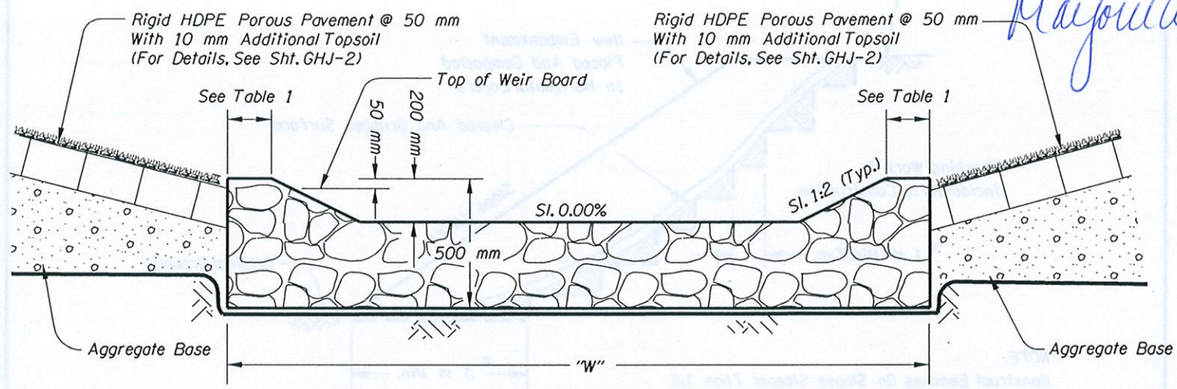


PLAN

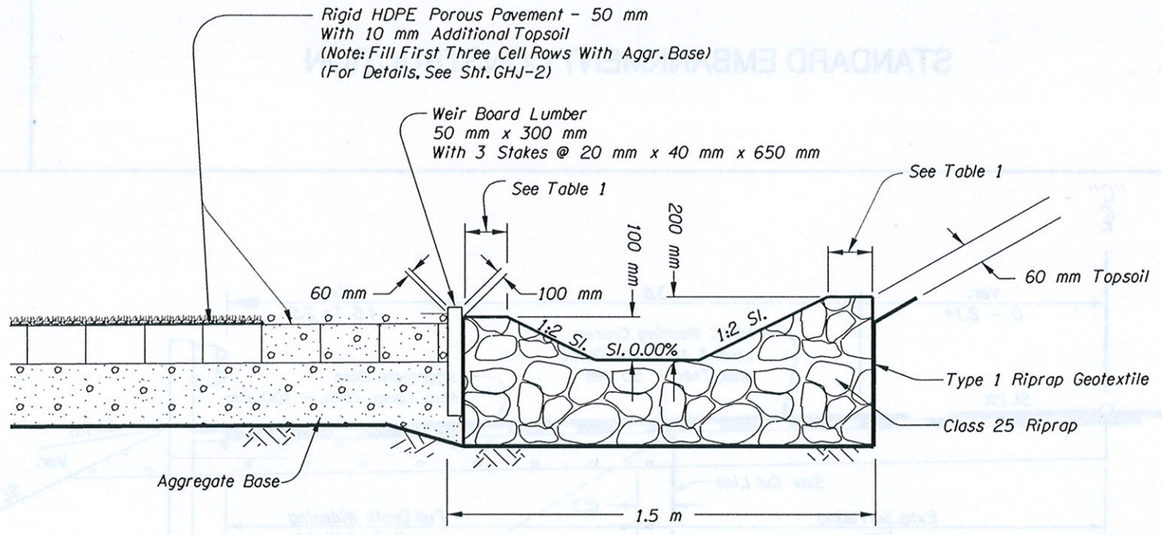
Table 1

Swale	Side Widths (mm) 1	2	3	4	Pipe Outfall Side	"W"	Top of Weir Board Elev.
A	150	150	150	300	#4	2.4 m	13.26 m

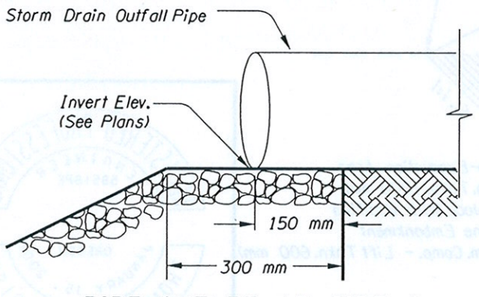
SWALE FLOW SPREADER



SECTION A-A



SECTION B-B



PIPE OUTLET AT SIDE 4
(From Manhole To Spreader)

All Dimensions Are In Millimeters (mm)
Unless Otherwise Noted.

REGISTERED PROFESSIONAL ENGINEER
17837PE
OREGON
JULY 25, 1995
TIMOTHY P. FREDETTE
Expires Dec. 31, 2003

OREGON DEPARTMENT OF TRANSPORTATION
GEO / HYDRO SECTION

US30: LOWER COLUMBIA RIVER HWY. AT SCAPPOOSE-VERNONIA RD. (SCAPPOOSE) SEC.
LOWER COLUMBIA RIVER HIGHWAY
COLUMBIA COUNTY

Project Leader - Bret N. Richards
Designed By - Timothy P. Fredette
Drafted By - Martin G. Casillas

WATER QUALITY DETAILS

SHEET NO. GHJ-4

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VIEW 1

VIEW 1