OPERATION & MAINTENANCE MANUAL

DFI No. D00184
Facility Type: Water Quality Manhole

JUNE, 2011

INDEX

1. Identification

Drainage Facility ID (DFI):	**D00184**
Facility Type:	Water Quality Manhole
Construction Drawings:	(V-File Number) 37V-041
Location:	District: 2B (Old 2A)
	Highway No.: 047
	Mile Post: 67.98 (beg./end)
	Description: This facility is located on the north side of westbound US 26 (Hwy 047), 1,380 feet west of SW Cedar Hills Blvd. Access to the facility can be obtained from Corby Drive.

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, Bruce S. Council, (503) 731-8319
Facility construction:	March 11, 2004
Contractor:	Mowatt Construction Company

4. Storm Drain System and Facility Overview

This water quality manhole is an underground flow-through structure with a settling or separation unit designed to treat stormwater runoff by removing sediment and other pollutants. The system is an ODOT internally designed facility, providing pollution control and treatment through sedimentation by separating contaminants from the stormwater runoff. It is designed to treat stormwater runoff by separating contaminants, such as floatables (trash, debris and oil) and settleable particles, like sediment, from stormwater.

Inflows enter the manhole from the inlet pipe and subsequently go into an open weir channel. From the open weir channel, the treatment flow drops down into the manhole sump (its treatment zone) via a vertical pipe with an L-shaped lower portion. In the treatment zone, the treatment flow volume accumulates up to the elevation of the bottom of the open weir channel.

Contaminants separate from the treatment flow volume due to density differences. Contaminants less dense than water float to the top of the volume, and contaminants denser than water sink. As new flow enters the treatment zone, the input displaces old treatment flow and pushes it up another vertical pipe (which has an L-shaped lower portion.) This pipe leads to the open weir channel, which conveys the outflow to the manhole's outlet pipe.

The water quality manhole is located on the north side of westbound US 26 (Hwy 047). Access to the manhole can be obtained from SW Corby Drive through an access gate. Access via the freeway (Hwy 047) is possible, but limited by a concrete barrier and narrow shoulder.

The drainage area for the manhole includes both the onramp to westbound US 26 (Hwy 047) and the north half of the westbound US 26 (Hwy 047) from the facility to Cedar Hills Blvd, which is approximately 1,350 feet to the east. The flow is collected by a series of inlets, and is conveyed by 12 and 15-inch diameter storm pipes.

A high-low split flow manhole, (See Operational Plan, Point A), is located just to the south of the water quality manhole (Point B). This split-flow manhole diverts the high flow into a detention pipe facility (DFI D00178) just to the west. Low flows, on the other hand, are diverted to the water quality manhole and pretreated before being discharged into a water quality swale (Point C, DFI D00177). The water quality manhole and swale are considered offline facilities with only low flows being directed to them by the split flow manhole.

After the water is treated through the swale, it is discharged into a 21-inch storm pipe that drains towards the west. The adjacent detention facility (DFI D00178) discharges into the same storm pipe.

For further information and details regarding the system refer to Appendix A for the Operational Plan and Appendix B for the Construction Project Plan sheets.

A. Maintenance equipment access:
   The facility can be accessed from west via SW Corby Dr. just north of US26 (Hwy 047).

B. Heavy equipment access into facility:

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

C. Special Features:

   ☐ Amended Soils – Compost-Topsoil blend
   ☐ Porous Pavers
   ☐ Liners
   ☐ Underdrains

Photo 1: Looking NW at Water Quality Manhole and adjoining swale (D00177).

Photo 2: Internal view of Water Quality Manhole.

Photo 3: Internal view of Water Quality Manhole.

5. Facility Haz Mat Spill Feature(s)

The water quality manhole and its sump can be used to store a volume of liquid by blocking 15-inch diameter outlet pipe located at the outlet of the

water quality manhole. This pipe is denoted as part of Point B in the Operational Plan for the facility.

6. Auxiliary Outlet (High Flow Bypass)

Auxiliary Outlets are provided if the primary outlet control structure can not 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

☒Other, as noted – This facility does not contain an auxiliary outlet.

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 or 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

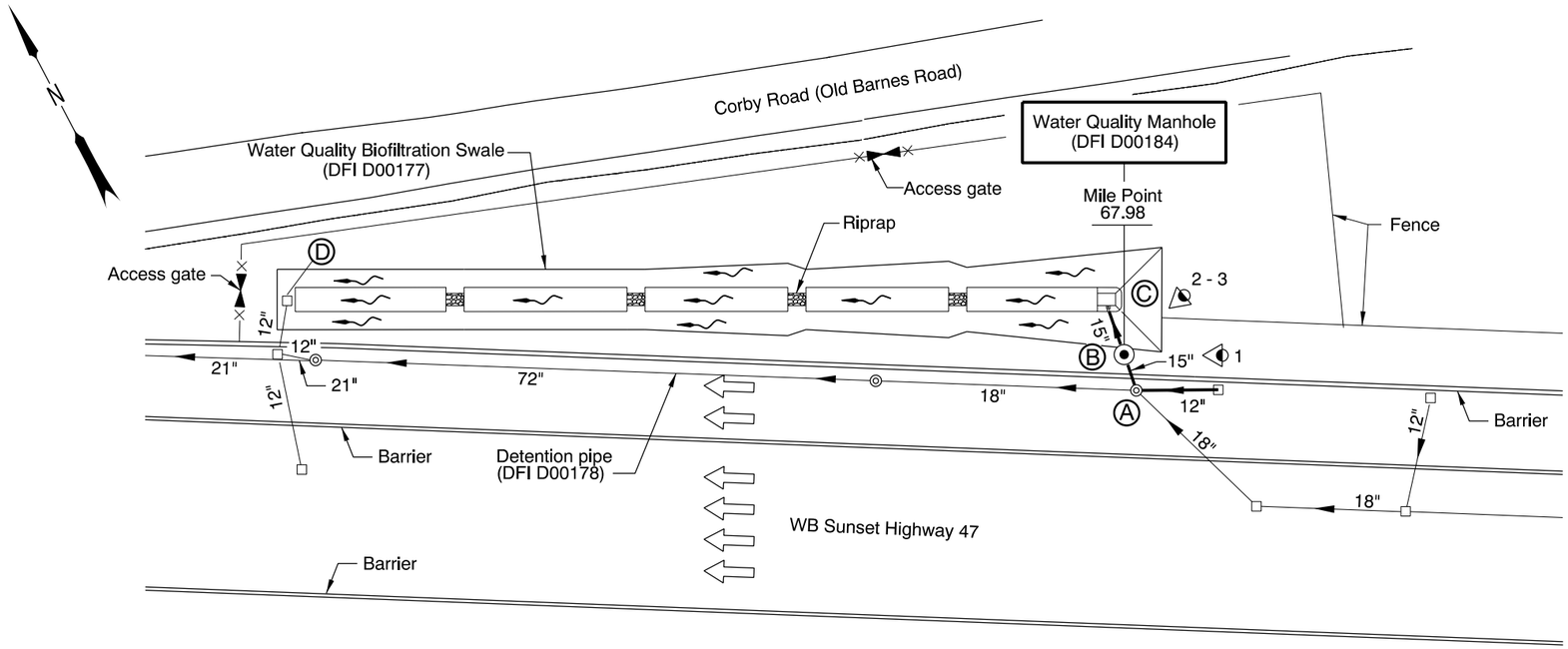
Contact any of the following for more detailed information about management of waste materials found on site:

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

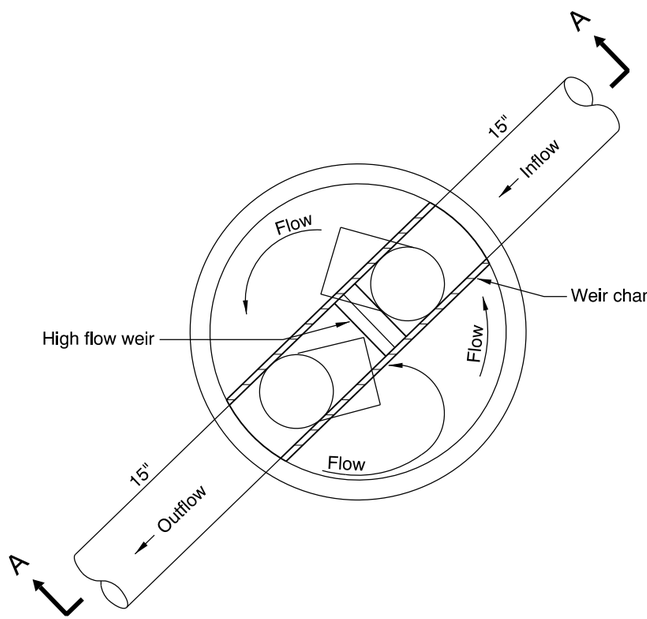
Appendix A

Content:

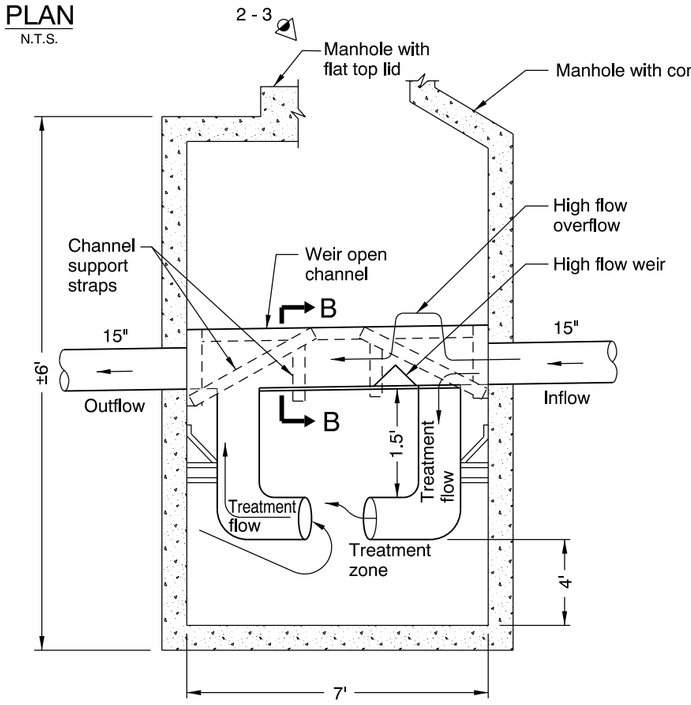
- **Operational Plan and Profile Drawing(s)**



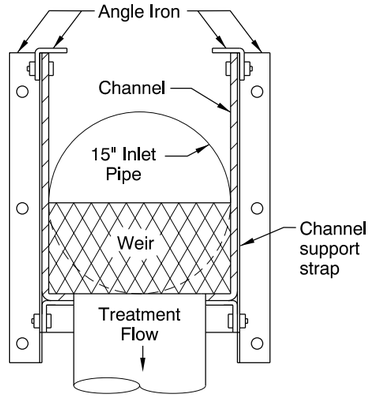
PLAN
N.T.S.



WATER QUALITY MANHOLE DETAIL AT POINT Ⓑ
N.T.S.



SECTION A-A
N.T.S.



SECTION B-B
N.T.S.

LEGEND:

- Photo Location / Direction
- Ⓐ Diversion manhole, "High-Low"
- Ⓑ Water quality manhole
- Ⓒ Flow spreader/inlet
- Ⓓ Swale outlet
- ◉ and/or ◎ Manhole
- ■ and/or □ Inlet
- Storm Pipe (Facility)
- Storm Pipe
- Conveyance Direction
- Pavement / Facility Flow Path
- Traffic flow/direction

Sht. 1 of 1

OREGON DEPARTMENT OF TRANSPORTATION

Prepared By: Bob Knorr

Drafted By: Mathew Bunde

DFI D00184
MAINTENANCE DISTRICT 2B HWY 47
WATER QUALITY MANHOLE
SUNSET HWY MP 67.98
WASHINGTON COUNTY

Appendix B

Content:

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

37V-41

INDEX OF SHEETS	
SHEET NO.	DESCRIPTION
1	Title Sheet
1A, 1A-2	Index Of Sheets Cont'd.
1A-3	Std. Drg. Nos.
1B	Sheet Layout
2, 2A, 2A-2 Thru 2A-65 Incl.	Typical Sections
2B, 2B-2 Thru 2B-18 Incl.	Details
2C, 2C-2	Traffic Control Details
2CA, 2CA-2, 2CA-2A, 2CA-3 Thru 2CA-57 Incl.	Traffic Control Plans - Murray Work Area
2CB, 2CB-2 Thru 2CB-12 Incl.	Traffic Control Plans - Cornell Work Area
2D, 2D-2, Thru 2D-12, Incl.	Pipe Data Sheet

STATE OF OREGON

DEPARTMENT OF TRANSPORTATION

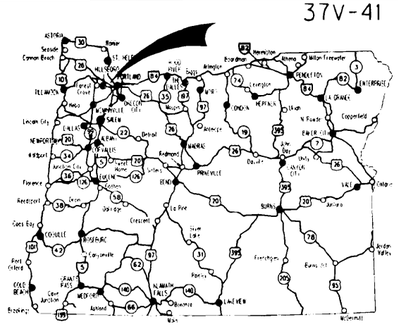
PLANS FOR PROPOSED PROJECT

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

US26: CORNELL RD. - OR217 (BEAVERTON) SEC.

SUNSET HIGHWAY

WASHINGTON COUNTY
MARCH 2004

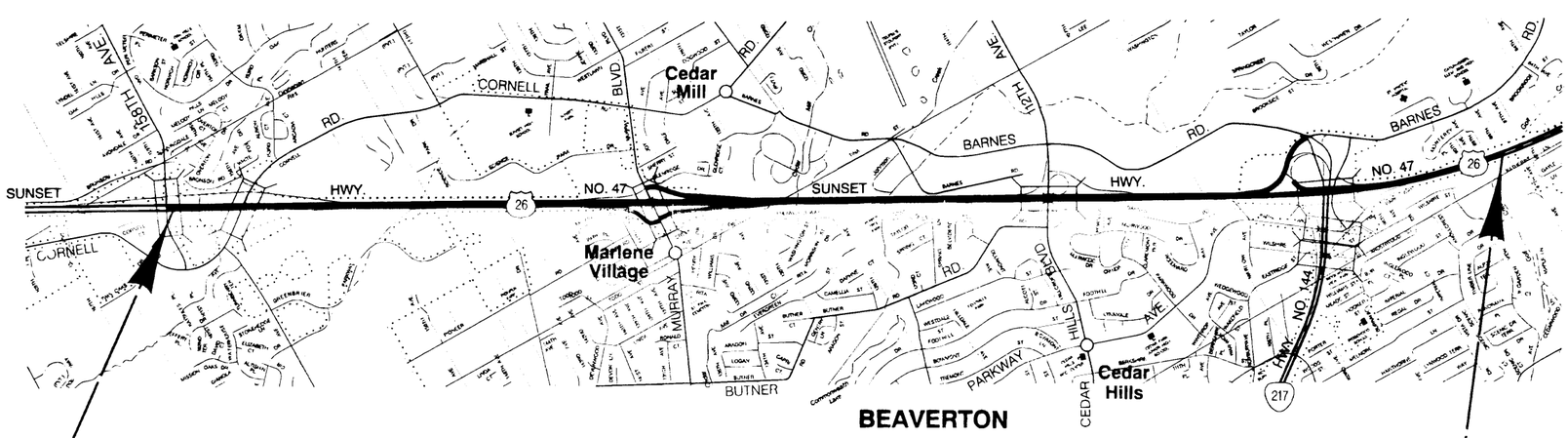


Overall Length Of Project - 6.51 km (4.05 Miles)

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.)

OTIA
OREGON TRANSPORTATION INVESTMENT ACT

LET'S ALL WORK TOGETHER TO MAKE THIS JOB SAFE



BEGINNING OF PROJECT
NH-OTIA-S047(052)
STA. "LW" 91+660.00 (M.P. 65.68)

END OF PROJECT
NH-OTIA-S047(052)
STA. "L" 98+160.00 (M.P. 69.73)

T. 1 N., R. 1 W., W.M.

OREGON TRANSPORTATION COMMISSION

Stuart Foster	CHAIRMAN
Gail L. Achterman	COMMISSIONER
Mike Nelson	COMMISSIONER
Randall Papé	COMMISSIONER
John Russell	COMMISSIONER
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
TECHNICAL SERVICES MANAGING ENGINEER

METRIC

US26: CORNELL RD. - OR217 (BEAVERTON) SEC.
SUNSET HIGHWAY
WASHINGTON COUNTY

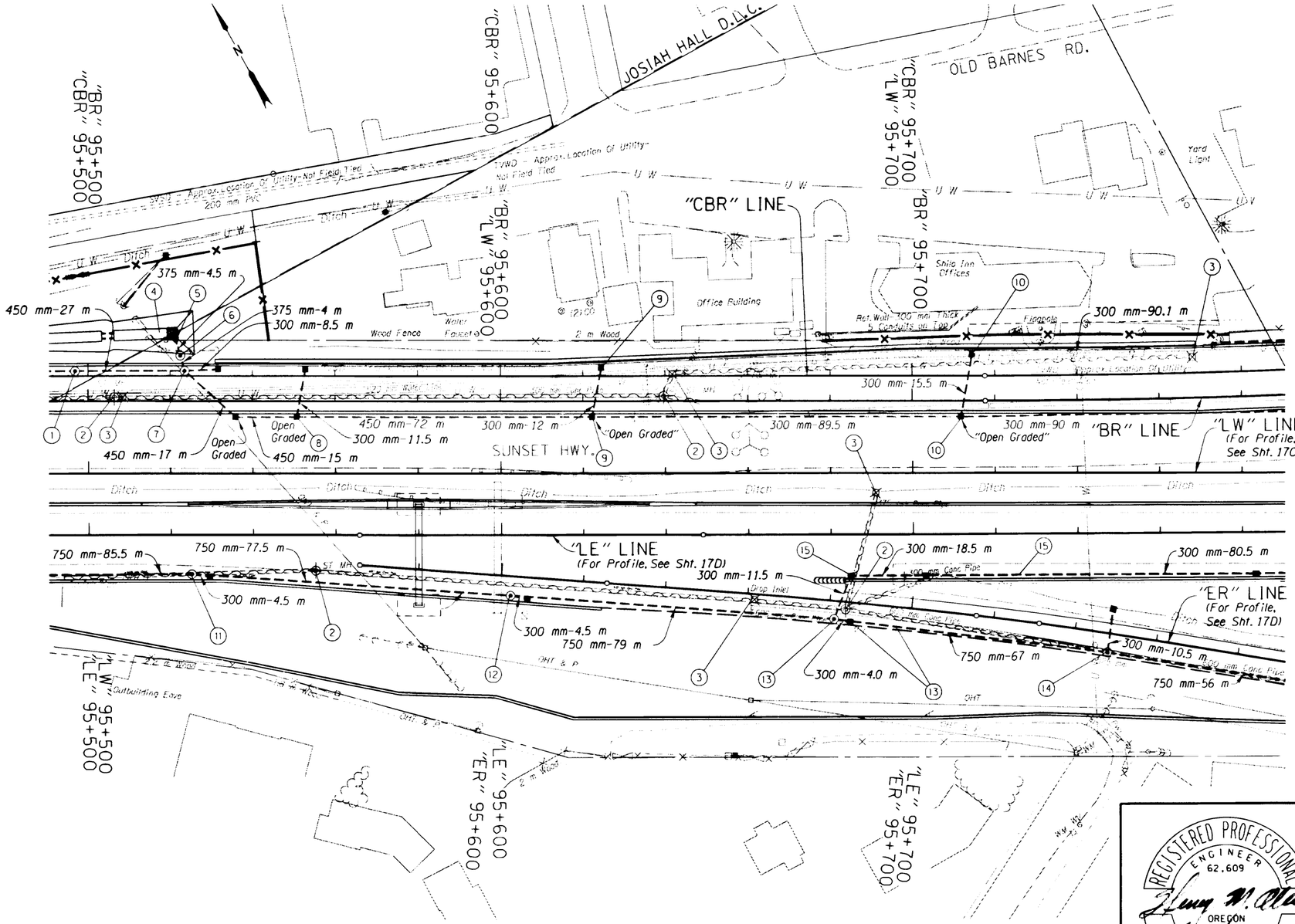
FEDERAL HIGHWAY ADMINISTRATION	PROJECT NUMBER	SHEET NO.
OREGON DIVISION	NH-OTIA-S047(052)	1

PE000656/C0341403-011

F:\ODOT DATA\Projects\13459 Cornell 217\13459r1.tsl 1/16/2004 1:19:56 PM bwve07n

Sec. 3, T. 1S, R. 1W, W.M.

37V-41



Abandon Pipes, Shown Thus:

OREGON DEPARTMENT OF TRANSPORTATION
ROADWAY ENGINEERING SECTION

REGISTERED PROFESSIONAL ENGINEER
62,609
Henry M. Allen
OREGON
MAY 9, 2000
HENRY MINTON ALLEN
Expires Dec. 31, 2005

US26: CORNELL RD. -
OR217 (BEAVERTON) SEC.
SUNSET HIGHWAY
WASHINGTON COUNTY

Design Team Leader - Eileen J. Phelan
Designed By - Henry M. Allen
Drafted By - Tien Nguyen

DRAINAGE & UTILITIES

SHEET NO.
17B

(1) Sta. "CBR" 95+496.83, Lt.
Const. Manhole, Large, 2700 mm Dia.
Inst. 450 mm Storm Sew. Pipe - 27.0 m
3 m Depth

(2) Remove Manhole - 4

(3) Remove Inlet - 5

(4) See Sht. 16A-2, Note 7

(5) Sta. "CBR" 95+521.24, Lt.
Inst. 375 mm Storm Sew. Pipe - 4.5 m
1.5 m Depth
Const. Paved End Slope - 3 m^2

(6) Sta. "CBR" 95+522.48, Lt.
Const. Manhole, Type Pollution Control
Inst. 375 mm Storm Sew. Pipe - 4.0 m
3 m Depth
(For Details, See Sht. GHJ-29)

(7) Sta. "CBR" 95+523.54, Lt.
Const. Manhole, Type Diversion, "High-Low"
Const. Type "G-2" Inlet
Const. Type "G-2" Open Graded HMAC Inlet
Inst. 300 mm Storm Sew. Pipe - 8.5 m
3 m Depth
Inst. 450 mm Storm Sew. Pipe - 32.0 m
3 m Depth
(For Details, See Sht. GHJ-18)

(8) Sta. "LW" 95+550.63, Lt.
Const. Type "G-2" Inlet
Const. Type "G-2" Open Graded HMAC Inlet
Inst. 300 mm Storm Sew. Pipe - 11.5 m
3 m Depth
Inst. 450 mm Storm Sew. Pipe - 72.0 m
3 m Depth
Rock Exc. - 12 m^3

(9) Sta. "LW" 95+622.17, Lt.
Const. Type "G-2" Inlet
Const. Type "G-2" Open Graded HMAC Inlet
Inst. 300 mm Storm Sew. Pipe - 101.5 m
3 m Depth
Rock Exc. - 12 m^3

(10) Sta. "LW" 95+711.65, Lt.
Const. Type "G-2" Inlet
Const. Type "G-2" Open Graded HMAC Inlet
Inst. 300 mm Storm Sew. Pipe - 105.5 m
3 m Depth
Rock Exc. - 12 m^3

(11) Sta. "LE" 95+524.99, Rt.
Const. Manhole, Large, 1500 mm Dia.
Const. Type "G-2" Open Graded HMAC Inlet
Inst. 300 mm Storm Sew. Pipe - 4.5 m
3 m Depth
Inst. 750 mm Storm Sew. Pipe - 77.5 m
6 m Depth

(12) Sta. "ER" 95+602.54, Rt.
Const. Manhole, Large, 1500 mm Dia.
Const. Type "G-2" Open Graded HMAC Inlet
Inst. 300 mm Storm Sew. Pipe - 4.5 m
3 m Depth
Inst. 750 mm Storm Sew. Pipe - 79.0 m
6 m Depth

(13) Sta. "ER" 95+681.37, Rt.
Const. Manhole, Large, 1500 mm Dia.
Const. Type "G-2" Inlet
Inst. 300 mm Storm Sew. Pipe - 15.5 m
3 m Depth
Inst. 750 mm Storm Sew. Pipe - 67.0 m
6 m Depth

(14) Sta. "ER" 95+748.54, Rt.
Const. Manhole, Large, 1500 mm Dia.
Const. Type "G2-MA" Inlet
Remove Extg. Pipe - 56.0 m
Inst. 300 mm Storm Sew. Pipe - 10.5 m
3 m Depth
Inst. 750 mm Storm Sew. Pipe - 56.0 m
6 m Depth

(15) Sta. "LE" 95+684.81, Rt.
Const. Type "G-2" Open Graded HMAC Inlet - 2
Inst. 300 mm Storm Sew. Pipe - 99.0 m
1.5 m Depth

REGISTERED PROFESSIONAL ENGINEER
62,609
OREGON
MAY 9, 2000
HENRY MINTON ALLEN
Expires Dec. 31, 2005

OREGON DEPARTMENT OF TRANSPORTATION
ROADWAY ENGINEERING SECTION

US26: CORNELL RD. -
OR217 (BEAVERTON) SEC.
SUNSET HIGHWAY
WASHINGTON COUNTY

Design Team Leader - Eileen J. Phelan
Designed By - Henry M. Allen
Drafted By - Tien Nguyen

DRAINAGE & UTILITIES NOTES

SHEET NO. 17B-2

"LW" LINE

200 mm Overlay
50 mm Inlay
875 mm
97.112o
Subgrade
272 m V.C.
+771.800
Profile Grade ℄
Ground Line ℄
300 mm-90 m
+3.88%
+714.38 Inlet F.L. 92.057
300 mm-15.5 m +1.00%
+711.65 Inlet F.L. 91.905
200 mm Overlay
50 mm Inlay
100 mm Overlay
50 mm Inlay
300 mm-89.5 m
+4.64%
+4.992%
+624.31 Inlet F.L. 87.873
300 mm-12 m +1.00%
+622.17 Inlet F.L. { 87.603 (450 mm)
87.753 (300 mm)
450 mm-72 m
+4.98%
100 mm Overlay
50 mm Inlay
875 mm
300 mm-8.5 m
+7.37%
300 mm-11.5 m
+1.00%
+552.80 Inlet F.L. 84.307
+550.63 Inlet { F.L. 84.042 (450 mm)
F.L. 84.192 (300 mm)
450 mm-15 m +4.92%
+535.70 Inlet F.L. 83.311
450 mm-17 m +4.92%
+531.66 Inlet F.L. 83.100
Subgrade
+523.54 Diversion M.H. F.L. 82.496
375 mm-4.0 m +1.00%
+522.48 Pollution Control M.H. F.L. 82.460
450 mm-27 m
+7.10%
375 mm-4.5 m +1.00%
+521.24 Pipe F.L. 82.415
+542.00 Outfall F.L. 83.80

90 89 88 87 86 85 84 83 82 81

98 97 96 95 94 93 92 91 90 89 88

"LW" EARTHWORK
Exc. 4344 (Excess)
Stone Emb. 3

MEDIAN EARTHWORK
(See Sht. 17D "LE" Line)
Exc. 1298 (Excess)
Stone Emb. 151

"LW"95+500 "LW"95+600 "LW"95+700

REGISTERED PROFESSIONAL ENGINEER
17,856
OREGON
JULY 25, 1995
DANNY Y. HORI
Expires Jun. 30, 2005

OREGON DEPARTMENT OF TRANSPORTATION
ROADWAY ENGINEERING SECTION

US26: CORNELL RD. - OR217 (BEAVERTON) SEC.
SUNSET HIGHWAY
WASHINGTON COUNTY

Design Team Leader - David Joe Polly
Designed By - Danny Y. Hori
Drafted By - Tien Nguyen

PROFILE

SHEET NO. 17C

1:1000 - 3

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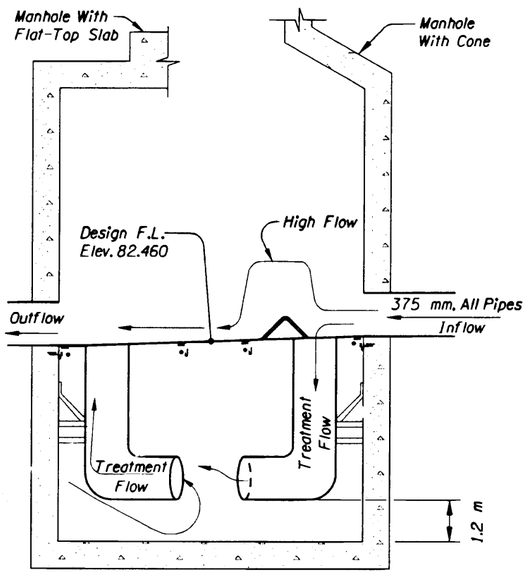
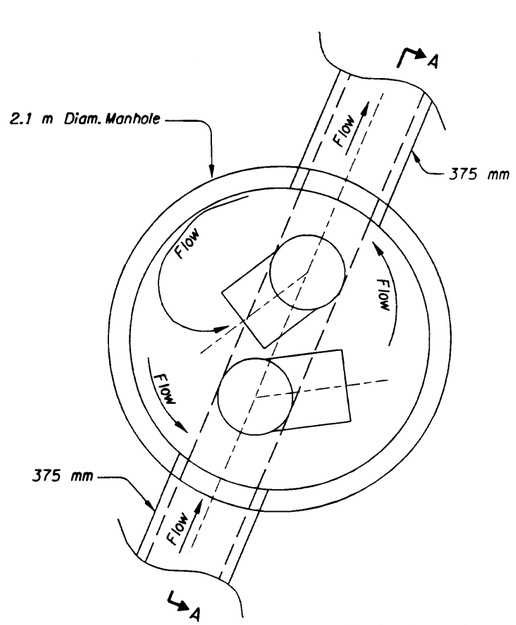


SECTION A-A

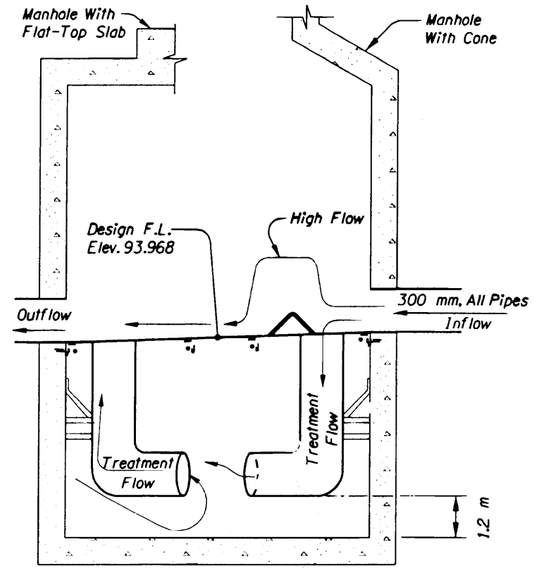


PLAN

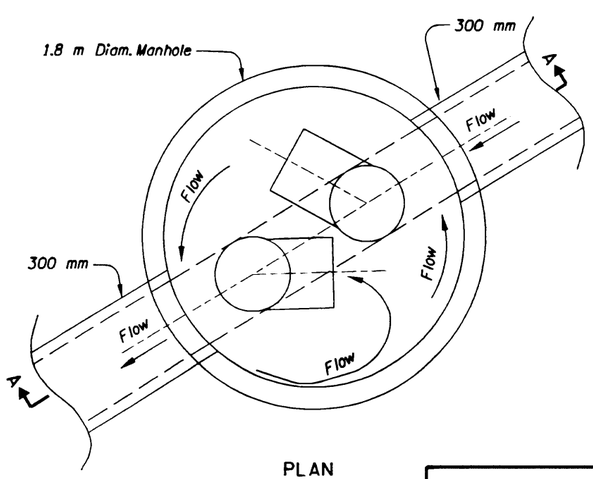
For Details Not Shown, See Sht. GHJ-31

POLLUTION CONTROL MANHOLE

Sta. "CBR"95+522, Lt.



SECTION A-A



PLAN

For Details Not Shown, See Sht. GHJ-31

POLLUTION CONTROL MANHOLE

Sta. "D"96+028, Rt.

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

REGISTERED PROFESSIONAL ENGINEER
62,609
OREGON
MAY 9, 2000
HENRY MINTON ALLEN
Expires Dec. 31, 2005

OREGON DEPARTMENT OF TRANSPORTATION
GEO / HYDRO SECTION

US26: CORNELL RD. - OR217 (BEAVERTON) SEC.
SUNSET HIGHWAY
WASHINGTON COUNTY

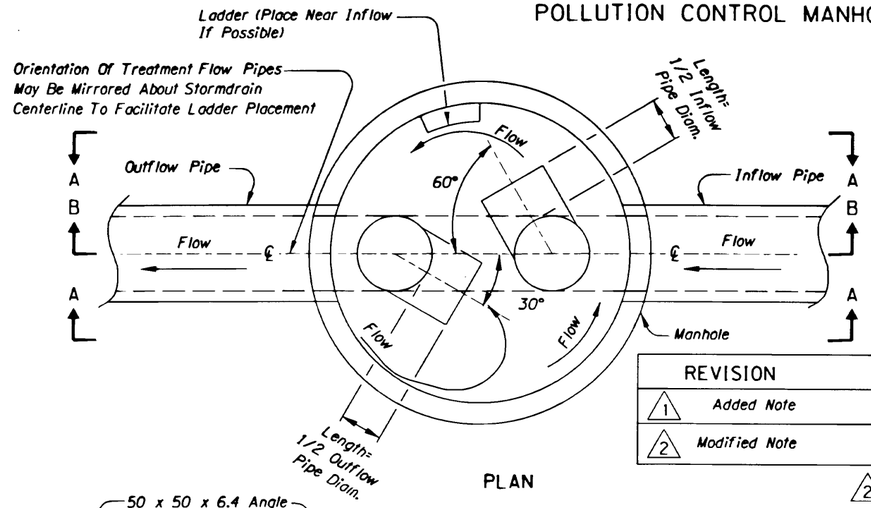
Project Leader - Naveen Chandra
Designed By - Henry M. Allen
Drafted By - Martin G. Casillas

WATER QUALITY DETAILS

SHEET NO. GHJ-29

VIEW 5

POLLUTION CONTROL MANHOLE GENERAL DETAILS



PLAN

REVISION	DATE	BY
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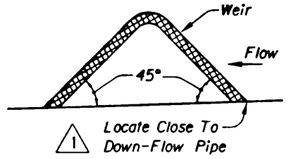
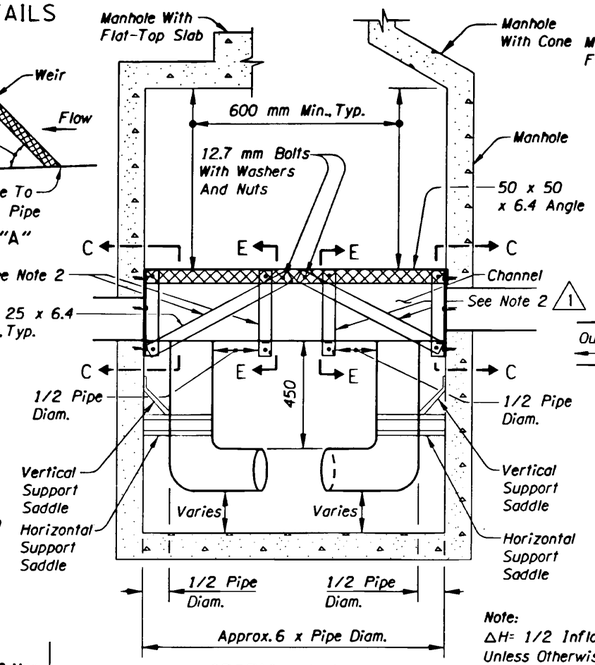
2 Modified Note	2-19-04	HMA

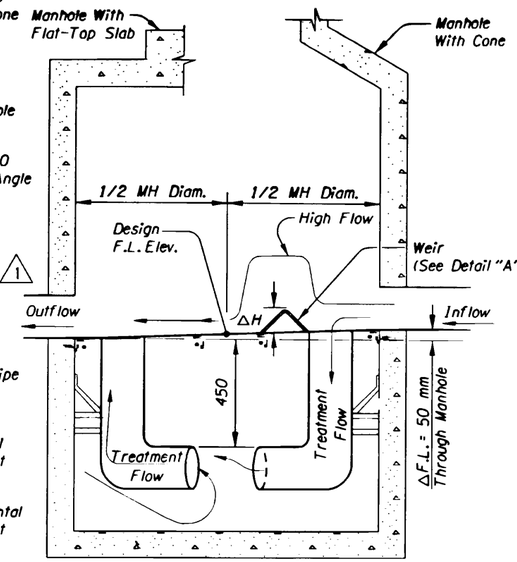


1 Locate Close To Down-Flow Pipe

DETAIL "A"

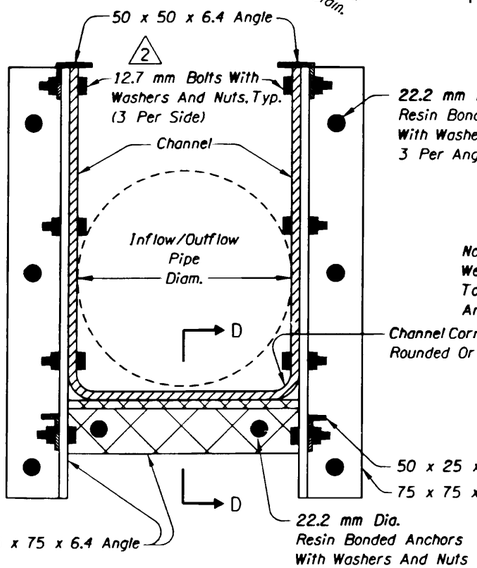


SECTION A-A

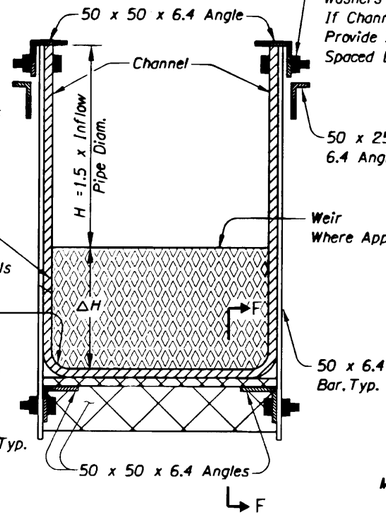


Note:
ΔH = 1/2 Inflow Pipe Diam. Unless Otherwise Specified

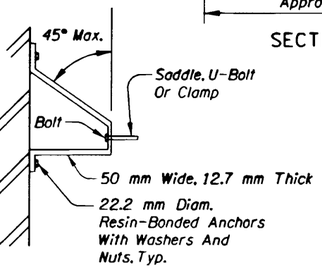
INSIDE SECTION B-B



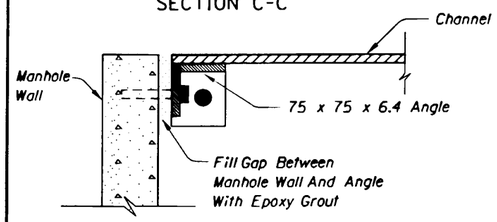
SECTION C-C



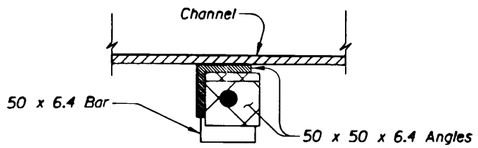
SECTION E-E



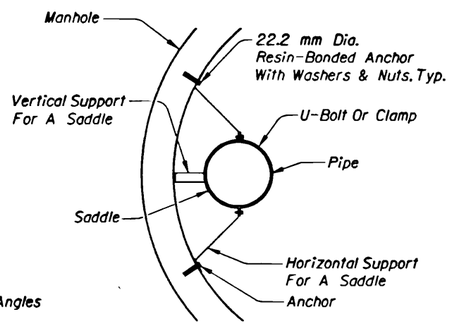
ELEVATION
VERTICAL PIPE SUPPORT



SECTION D-D
(Typ. Both Sides)



SECTION F-F
(Typ. Both Sides)



PLAN
HORIZONTAL PIPE SUPPORT

Notes:
1. Channel And Weir To Be Made Of 12.7 mm Thick HDPE Or 4.8 mm Thick. Min., Stainless Steel. Any Joints In Channel To Be Permanent, Strong And Watertight.
2. Angles And Bars Shall Be A36 Steel Or Stronger. Vertical And Diagonal Supports For Channel Span Not Necessary If Channel Is Steel.
3. Pipes Within Manhole To Be Corrugated HDPE, HDPE SDR26, PVC Sch. 40 Or 3.2 mm Min. Thick Stainless Steel. Flanges (12 Bolts) To Be Of These Materials.
4. Pipes And Channel Must Have Water Tight Joints And Smooth Interior Walls With Manning's "n" ≤ 0.013
5. Fasten Pipes To Wall Using 50 mm Wide By 12.7 mm Thick Straps With 22 mm Diameter U-Bolts Or Clamps.
6. Vertical Pipes To Be Set Away From Wall So That There Is A Clear Space Between The Manhole Wall And The Outside Pipe Wall Equal To At Least , But Not Much More Than, 1/2 Pipe Diameter.
7. Provide Permanent Watertight Seals Between Channel End And Manhole Wall, Between Channel Floor And Pipes Within The Manhole And Between The Weir And Channel.
8. All Hardware Shall Be Stainless Steel Or Hot-Dipped Galvanized.
9. For Resin-Bonded Anchors, Use Steel Threaded Rods.
10. Embed Resin-Bonded Anchors 100 mm, Min. Into Concrete. Use High Or Low Strength Resin From ODOT's Qualified Products List, Suitable For Wet Or Submerged Locations.
11. Dimensional Relationships, Ratios, And Pipe Rotation Angles Shown Are Typical For All Pollution Control Manholes Except Where Otherwise Noted At Specific Location(s).
12. For Other Details Not Shown, See Sht. GHJ-20 And Drawing No. RD340.
13. All Dimensions Are In Millimeters (mm) Unless Otherwise Noted.

REGISTERED PROFESSIONAL ENGINEER
62,609
OREGON
MAY 9, 2000
HENRY MINTON ALLEN
Expires Dec. 31, 2005

OREGON DEPARTMENT OF TRANSPORTATION
GEO / HYDRO SECTION

US26: CORNELL RD. - OR217 (BEAVERTON) SEC.
SUNSET HIGHWAY
WASHINGTON COUNTY

Project Leader - Naveen Chandra
Designed By - Henry M. Allen
Drafted By - Martin G. Casillas

WATER QUALITY DETAILS

SHEET NO. GHJ-31

VIEW